

Wednesday, February 24, 2010

# LOS ALAMOS

## NATIONAL LABORATORY

ATTN: Valerie Davis

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd

Charleston, SC 29407

Page 1 of 2  
REQUEST NUMBER: 10-2026

These Samples are on:

LANL Request Number: 10-2026

Per Agreement Number: 126310011

Project Cost Code: MR3A05529E00

Please analyse the enclosed samples  
according to the schedule indicated:

SHIP DATE: 2/24/2010

TURNAROUND/REPORT DUE: 3/26/2010

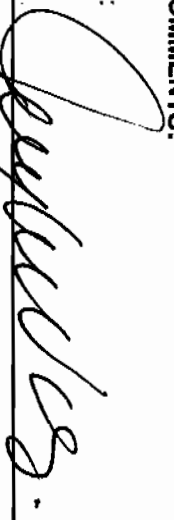
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Yes, Below Background

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:



| PRIORITY | METHOD CODE | CNTNR | SAMPLE ID    | SAMPLE MATRIX | DATE SAMPLED | SPECIAL INSTRUCTIONS |
|----------|-------------|-------|--------------|---------------|--------------|----------------------|
|          | EPA:901.1   | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | EPA:906.0   | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |

Wednesday, February 24, 2010

REQUEST NUMBER: 10-2026

| PRIORITY | METHOD CODE     | CNTNR | SAMPLE ID    | SAMPLE MATRIX | DATE SAMPLED | SPECIAL INSTRUCTIONS |
|----------|-----------------|-------|--------------|---------------|--------------|----------------------|
|          | EPA.906.0       | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:AM-241 | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:ISOPU  | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:ISOU   | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |

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Wednesday, February 24, 2010

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 10-2026

**LOS ALAMOS**

REQUEST NUMBER: 10-2026

**NATIONAL LABORATORY**

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/26/2010

General Engineering Laboratories, Inc.,  
Charleston, SC.

TURNAROUND REQ'D: 30

2040 Savage Rd

Charleston, SC 29407

## LAB REQUEST COMMENTS:

| SAMPLE ID    | CTNR | CTNR DESC | ORDER                   | PRESERV | MATRIX |
|--------------|------|-----------|-------------------------|---------|--------|
| RE36-10-8489 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8489 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8486 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8486 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8487 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8487 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8462 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8462 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8463 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8463 | 1    | POLY      | H3                      | Ice     | R      |

Relinquished By:

Date Time

Received By:

Date

Time

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Received for DISPOSAL By:

Date

Time

Remarks:

Printed Name

Signature

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2511

EVENT NAME: 4th Qtr. FY09 - SWMU 36-003(a) - Threemile Canyon

SAMPLE ID: RE36-10-8462

WORK ORDER:

| AS PLANNED                  |           | AS COLLECTED |  | AS PLANNED               |        | AS COLLECTED |  |
|-----------------------------|-----------|--------------|--|--------------------------|--------|--------------|--|
| DATE COLLECTED(MM/DD/YYYY): |           | 02/19/2010   |  | MEDIA:                   | QBT3   | QBT2         |  |
| TIME COLLECTED (HH:MM)      |           | 08:10        |  | SUB-MEDIA:               | TUFF 1 | OK           |  |
| PRS ID:                     | 36-003(a) | OK           |  | SAMPLE TECH CODE:        | HA     | CBS          |  |
| LOCATION ID:                | 36-610879 |              |  | FIELD QC TYPE:           | NA     | OK           |  |
| LOCATION TYPE:              | GENERIC   |              |  | FIELD PREP:              | NA     |              |  |
| TOP DEPTH:                  | 0         | 49.0 ft      |  | SAMPLE USAGE:            | INV    |              |  |
| BOTTOM DEPTH:               | 0         | 50.0 ft      |  | SCREEN/PORT DESC:        |        | N            |  |
| FIELD MATRIX:               | R         | OK           |  | EXCAVATED: YES/NO/NA     |        |              |  |
| COMPOSITE TYPE:             | NA        |              |  | COMPOSITE TIME INTERVAL: | NA     |              |  |
| BOREHOLE: YES/NO/NA         |           |              |  | WATER FLOWING: YES/NO/NA |        |              |  |
| BOREHOLE DECLINATION:       | -90°      |              |  | BOREHOLE DIRECTION:      | NA     |              |  |

| # | PRIORITY | ORDER                  | CNTNR  | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|----------|------------------------|--|--------------|---------------|----------------------|
| 1 | Normal   | 8082+8270+NME D-EXP    | 500 ML AMBER GLASS                           | Ice          | Y             |                      |
| 1 |          | 8260B                  | 125 ML SEPTUM AMBER GLASS <i>amber clear</i> | Ice          |               |                      |
| 1 |          | AM241+GS+ISO PU+ISOU   | 1 LITER POLY                                 | None         |               |                      |
| 1 |          | H3                     | 500 ML POLY                                  | Ice          |               |                      |
| 1 |          | METALS+U-GEL           | 125 ML POLY                                  | Ice          |               |                      |
| 1 |          | Perchlorate+CN+ N03+pH | 500 ML POLY                                  | Ice          |               |                      |
| 1 |          | RADVANA+B+G            | 1 EA 8 IN RESEALABLE POLY BAG                | None         |               |                      |

## SAMPLE DESC:

Light pinkish gray, moderately indurated, slightly welded, dehydrated, dry, ash flow tuff

SAMPLE COMMENTS: NA

## LOCATION DESC:

3a-6

## FIELD SCREENING/MEASUREMENT RESULTS:

Alpha = 28 dpm  
Beta/Gamma = 300 dpm

PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

J. MARIN

REVIEWED BY (PRINT)

LARRY A. LOPEZ

|                                 |           |                                      |           |
|---------------------------------|-----------|--------------------------------------|-----------|
| RELINQUISHED BY                 | Date/Time | RECEIVED BY                          | Date/Time |
| (Printed Name) JON MARIN        | 2/19/10   | (Printed Name) Sherrill Sherwood     | 2/19/10   |
| (Signature) <i>Jon R. Marin</i> | 1535      | (Signature) <i>Sherrill Sherwood</i> | 1535      |
| RELINQUISHED BY                 | Date/Time | RECEIVED BY                          | Date/Time |



## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2511

EVENT NAME: 4th Qtr. FY09 - SWMU 36-003(a) - Threemile Canyon

SAMPLE ID: RE36-10-8463

WORK ORDER:

| AS PLANNED                  |           | AS COLLECTED |  | AS PLANNED               |        | AS COLLECTED |  |
|-----------------------------|-----------|--------------|--|--------------------------|--------|--------------|--|
| DATE COLLECTED(MM/DD/YYYY): |           | 02/19/2010   |  | MEDIA:                   | QBT3   | QBT2         |  |
| TIME COLLECTED (HH:MM)      |           | 08:40        |  | SUB-MEDIA:               | TUFF 1 | OK           |  |
| PRS ID:                     | 36-003(a) | OK           |  | SAMPLE TECH CODE:        | HA     | CB5          |  |
| LOCATION ID:                | 36-610879 |              |  | FIELD QC TYPE:           | NA     | OK           |  |
| LOCATION TYPE:              | GENERIC   |              |  | FIELD PREP:              | NA     |              |  |
| TOP DEPTH:                  | 0         | 59.0 ft      |  | SAMPLE USAGE:            | INV    |              |  |
| BOTTOM DEPTH:               | 0         | 60.0 ft      |  | SCREEN/PORT DESC:        |        | NA           |  |
| FIELD MATRIX:               | R         | OK           |  | EXCAVATED: YES/NO/NA     |        |              |  |
| COMPOSITE TYPE:             | NA        |              |  | COMPOSITE TIME INTERVAL: | NA     |              |  |
| BOREHOLE:                   | YES/NO/NA |              |  | BOREHOLE DECLINATION:    | -90°   |              |  |
|                             |           |              |  | BOREHOLE DIRECTION:      | NA     |              |  |

| # | PRIORITY | ORDER                     | CNTNR                                      | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|----------|---------------------------|--|--------------|---------------|----------------------|
| 1 | Normal   | 8082+8270+NME<br>D-EXP    | 500 ML AMBER GLASS                         | Ice          | Y             |                      |
| 1 |          | 8260B                     | 125 ML SEPTUM AMBER GLASS<br>2/19/10 clear | Ice          |               |                      |
| 1 |          | AM241+GS+ISO<br>PU+ISOU   | 1 LITER POLY                               | None         |               |                      |
| 1 |          | H3                        | 500 ML POLY                                | Ice          |               |                      |
| 1 |          | METALS+U-<br>GEL          | 125 ML POLY                                | Ice          |               |                      |
| 1 |          | Perchlorate+CN+<br>N03+pH | 500 ML POLY                                | Ice          |               |                      |
| 1 |          | RADVANA+B+G               | 1 EA 8 IN RESEALABLE<br>POLY BAG           | None         |               |                      |

SAMPLE DESC: pinkish grey tuff - slightly well sorted

SAMPLE COMMENTS: NA

LOCATION DESC: 3a-6

## FIELD SCREENING/MEASUREMENT RESULTS:

Alpha = 19 dpm  
Beta/Gamma = 89 dpm  
758

PID <sup>1RM 2/19/10</sup> Ambient Reading = ppm

COLLECTED BY (PRINT)

J. MARIN

REVIEWED BY (PRINT)

Gregory A. Lopez

|                          |           |                               |           |
|--------------------------|-----------|-------------------------------|-----------|
| RELINQUISHED BY          | Date/Time | RECEIVED BY                   | Date/Time |
| (Printed Name) JON MARIN | 2/19/10   | (Printed Name) Sheri Sherwood | 2/19/10   |
| (Signature) Jon R. Marin | 15:35     | (Signature) Sheri Sherwood    | 1535      |
| RELINQUISHED BY          | Date/Time | RECEIVED BY                   | Date/Time |

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2511

EVENT NAME: 4th Qtr. FY09 - SWMU 36-003(a) - Threemile Canyon

SAMPLE ID: RE36-10-8486

WORK ORDER:

| AS PLANNED                  |           | AS COLLECTED |  | AS PLANNED               |        | AS COLLECTED |                          |
|-----------------------------|-----------|--------------|--|--------------------------|--------|--------------|--------------------------|
| DATE COLLECTED(MM/DD/YYYY): |           | 02/19/2010   |  | MEDIA:                   | QBT3   |              | QBT2                     |
| TIME COLLECTED(HH:MM)       |           | 09:07        |  | SUB-MEDIA:               | TUFF 1 |              | OK                       |
| PRS ID:                     | 36-003(a) | OK           |  | SAMPLE TECH CODE:        | HA     |              | CBS                      |
| LOCATION ID:                | UNK       | 36-15-610879 |  | FIELD QC TYPE:           | NA     |              | OK                       |
| LOCATION TYPE:              | GENERIC   | OK           |  | FIELD PREP:              | NA     |              |                          |
| TOP DEPTH:                  | 0         | 69.0 ft      |  | SAMPLE USAGE:            | INV    |              |                          |
| BOTTOM DEPTH:               | 0         | 70.0 ft      |  | SCREEN/PORT DESC:        |        |              | NA                       |
| FIELD MATRIX:               | R         | OK           |  | EXCAVATED: YES/NO/NA     |        |              |                          |
| COMPOSITE TYPE:             | NA        |              |  | COMPOSITE TIME INTERVAL: | NA     |              | WATER FLOWING: YES/NO/NA |
| BOREHOLE: (YES/NO/NA)       |           |              |  | BOREHOLE DECLINATION:    | -90°   |              | BOREHOLE DIRECTION:      |
|                             |           |              |  |                          |        |              | NA                       |

| # | PRIORITY | ORDER                  | CNTNR                         | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|----------|------------------------|-------------------------------|--------------|---------------|----------------------|
| 1 | Normal   | 8082+8270+NME D-EXP    | 500 ML AMBER GLASS            | Ice          | Y             |                      |
| 1 |          | 8260B                  | 125 ML SEPTUM AMBER GLASS     | Ice          |               |                      |
| 1 |          | AM241+GS+ISO PU+ISOU   | 1 LITER POLY                  | None         |               |                      |
| 1 |          | H3                     | 500 ML POLY                   | Ice          |               |                      |
| 1 |          | METALS+U-GEL           | 125 ML POLY                   | Ice          |               |                      |
| 1 |          | Perchlorate+CN+ N03+pH | 500 ML POLY                   | Ice          |               |                      |
| 1 |          | RADVANA+B+G            | 1 EA 8 IN RESEALABLE POLY BAG | None         |               |                      |

SAMPLE DESC:

Light brownish gray, moderately indurated, nonwelded, dehydrified, dry, ark flow to a ft

SAMPLE COMMENTS: NA

LOCATION DESC: 3a-6

FIELD SCREENING/MEASUREMENT RESULTS:

Alpha = 97 dpm

Beta/Gamma = 549 dpm

PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

from 2/19/10  
at 2/19/10

COLLECTED BY (PRINT)

J. MARIN

REVIEWED BY (PRINT)

LARRY A. LOPEZ

|                          |           |                               |           |
|--------------------------|-----------|-------------------------------|-----------|
| RELINQUISHED BY          | Date/Time | RECEIVED BY                   | Date/Time |
| (Printed Name) JON MARIN | 2/19/10   | (Printed Name) Sheri Sherwood | 2/19/10   |
| (Signature) J. R. Marin  | 15:35     | (Signature) Sheri Sherwood    | 1535      |
| RELINQUISHED BY          | Date/Time | RECEIVED BY                   | Date/Time |

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2511

EVENT NAME: 4th Qtr. FY09 - SWMU 36-003(a) - Threemile Canyon

SAMPLE ID: RE36-10-8487

WORK ORDER:

| AS PLANNED                  |           | AS COLLECTED |  | AS PLANNED               |        | AS COLLECTED |                            |
|-----------------------------|-----------|--------------|--|--------------------------|--------|--------------|----------------------------|
| DATE COLLECTED(MM/DD/YYYY): |           | 02/19/2010   |  | MEDIA:                   | QBT3   |              | QBT2                       |
| TIME COLLECTED (HH:MM)      |           | 09:20        |  | SUB-MEDIA:               | TUFF 1 |              | OK                         |
| PRS ID:                     | 36-003(a) | OK           |  | SAMPLE TECH CODE:        | HA     |              | CB5                        |
| LOCATION ID:                | UNK       |              |  | FIELD QC TYPE:           | NA     |              | OK                         |
| LOCATION TYPE:              | GENERIC   | 36-15-610879 |  | FIELD PREP:              | NA     |              |                            |
| TOP DEPTH:                  | 0         | 77.5 ft      |  | SAMPLE USAGE:            | INV    |              |                            |
| BOTTOM DEPTH:               | 0         | 80.0 ft      |  | SCREEN/PORT DESC:        |        |              | NA                         |
| FIELD MATRIX:               | R         | OK           |  | EXCAVATED: YES (NO) NA   |        |              |                            |
| COMPOSITE TYPE:             | NA        |              |  | COMPOSITE TIME INTERVAL: | NA     |              | WATER FLOWING: YES (NO) NA |
| BOREHOLE: YES/NO/NA         |           |              |  | BOREHOLE DECLINATION:    | -90°   |              | BOREHOLE DIRECTION:        |

| # | PRIORITY | ORDER                  | CNTNR                         | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|----------|------------------------|-------------------------------|--------------|---------------|----------------------|
| 1 | Normal   | 8082+8270+NME D-EXP    | 500 ML AMBER GLASS            | Ice          | Y             |                      |
| 1 |          | 8260B                  | 125 ML SEPTUM AMBER GLASS     | Ice          |               |                      |
| 1 |          | AM241+GS+ISO PU+ISOU   | 1 LITER POLY                  | None         |               |                      |
| 1 |          | H3                     | 500 ML POLY                   | Ice          |               |                      |
| 1 |          | METALS+U-GEL           | 125 ML POLY                   | Ice          |               |                      |
| 1 |          | Perchlorate+CN+ N03+pH | 500 ML POLY                   | Ice          |               |                      |
| 1 |          | RADVANA+B+G            | 1 EA 8 IN RESEALABLE POLY BAG | None         |               |                      |

SAMPLE DESC: FD = RE36-10-8487 Reddish brown, moderately indurated, non welded, dehydrified, dry, ash flow tuff

SAMPLE COMMENTS: NA

LOCATION DESC: 3a-6

## FIELD SCREENING/MEASUREMENT RESULTS:

Alpha = 30 dpm  
Beta/Gamma = 681 dpm

PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

REVIEWED BY (PRINT)

J. MARIN

Lance A. Lopez

|                          |           |                                |           |
|--------------------------|-----------|--------------------------------|-----------|
| RELINQUISHED BY          | Date/Time | RECEIVED BY                    | Date/Time |
| (Printed Name) JON MARIN | 2/19/10   | (Printed Name) Sherri Sherwood | 2/19/10   |
| (Signature) Jon A. Marin | 15:35     | (Signature) Sherri Sherwood    | 1535      |
| RELINQUISHED BY          | Date/Time | RECEIVED BY                    | Date/Time |

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2511

EVENT NAME: 4th Qtr. FY09 - SWMU 36-003(a) - Threemile Canyon

SAMPLE ID: RE36-10-8489

WORK ORDER:

| AS PLANNED                  |           | AS COLLECTED |  | AS PLANNED               |           | AS COLLECTED |                          |
|-----------------------------|-----------|--------------|--|--------------------------|-----------|--------------|--------------------------|
| DATE COLLECTED(MM/DD/YYYY): |           | 02/19/2010   |  | MEDIA:                   | QBT3      |              | QBT2                     |
| TIME COLLECTED (HH:MM)      |           | 09:20        |  | SUB-MEDIA:               | TUFF 1    |              | OK                       |
| PRS ID:                     | 36-003(a) | OK           |  | SAMPLE TECH CODE:        | HA        |              | CBS                      |
| LOCATION ID:                | UNK       | 36-610879    |  | FIELD QC TYPE:           | ED        |              | OK                       |
| LOCATION TYPE:              | GENERIC   | OK           |  | FIELD PREP:              | NA        |              |                          |
| TOP DEPTH:                  | 0         | 77.5 ft      |  | SAMPLE USAGE:            | QC        |              |                          |
| BOTTOM DEPTH:               | 0         | 80.0 ft      |  | SCREEN/PORT DESC:        |           |              | NA                       |
| FIELD MATRIX:               | R         | OK           |  | EXCAVATED:               | YES/NO/NA |              |                          |
| COMPOSITE TYPE:             | NA        |              |  | COMPOSITE TIME INTERVAL: | NA        |              | WATER FLOWING: YES/NO/NA |
| BOREHOLE:                   | YES/NO/NA |              |  | BOREHOLE DECLINATION:    | -90°      |              | BOREHOLE DIRECTION:      |
|                             |           |              |  |                          |           |              | NA                       |

| # | PRIORITY | ORDER                  | CNTNR                                       | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|----------|------------------------|---|--------------|---------------|----------------------|
| 1 | Normal   | 8082+8270+NME D-EXP    | 500 ML AMBER GLASS                          | Ice          | Y             |                      |
| 1 |          | 8260B                  | 125 ML SEPTUM AMBER GLASS <i>100% clear</i> | Ice          |               |                      |
| 1 |          | AM241+GS+ISO PU+ISOU   | 1 LITER POLY                                | None         |               |                      |
| 1 |          | H3                     | 500 ML POLY                                 | Ice          |               |                      |
| 1 |          | METALS+U-GEL           | 125 ML POLY                                 | Ice          |               |                      |
| 1 |          | Perchlorate+CN+ N03+pH | 500 ML POLY                                 | Ice          |               |                      |
| 1 |          | RADVANA+B+G            | 1 EA 8 IN RESEALABLE POLY BAG               | None         |               |                      |

SAMPLE DESC: QC Sample of *REF-10-8487*

*Reddish brown, moderately indurated, non welded, devitrified, dry, ash flow tuff*

SAMPLE COMMENTS: *NA*LOCATION DESC: *3a-6*

FIELD SCREENING/MEASUREMENT RESULTS:

Alpha = *30* dpm  
Beta/Gamma = *681* dpm

*7RM 2/19/10*  
PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

*J. MARIN*

REVIEWED BY (PRINT)

*Larry A. Lopez*

|                                  |                |                                      |                |
|----------------------------------|----------------|--------------------------------------|----------------|
| RELINQUISHED BY                  | Date/Time      | RECEIVED BY                          | Date/Time      |
| (Printed Name) <i>JOHN MARIN</i> | <i>2/19/10</i> | (Printed Name) <i>Sherry Newwood</i> | <i>2/19/10</i> |
| (Signature) <i>John R. Marin</i> | <i>15:35</i>   | (Signature) <i>Sherry Newwood</i>    | <i>1535</i>    |
| RELINQUISHED BY                  | Date/Time      | RECEIVED BY                          | Date/Time      |

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2511

EVENT NAME: 4th Qtr. FY09 - SWMU 36-003(a) - Threemile Canyon

SAMPLE ID: RE36-10-8492

WORK ORDER:

| AS PLANNED                  |           | AS COLLECTED |  | AS PLANNED               |       | AS COLLECTED |                          |
|-----------------------------|-----------|--------------|--|--------------------------|-------|--------------|--------------------------|
| DATE COLLECTED(MM/DD/YYYY): |           | 02/19/2010   |  | MEDIA:                   | NA    |              | OK                       |
| TIME COLLECTED (HH:MM)      |           | 10:30        |  | SUB-MEDIA:               | OTHER |              |                          |
| PRS ID:                     | 36-003(a) | OK           |  | SAMPLE TECH CODE:        | DC    |              |                          |
| LOCATION ID:                | UNK       | 36-610879    |  | FIELD QC TYPE:           | ER    |              |                          |
| LOCATION TYPE:              | GENERIC   | OK           |  | FIELD PREP:              | UF    |              |                          |
| TOP DEPTH:                  | 0         | 0            |  | SAMPLE USAGE:            | QC    |              |                          |
| BOTTOM DEPTH:               | 0         | 0            |  | SCREEN/PORT DESC:        |       |              | NA                       |
| FIELD MATRIX:               | W         | OK           |  | EXCAVATED: YES/NO/NA     |       |              |                          |
| COMPOSITE TYPE:             | NA        |              |  | COMPOSITE TIME INTERVAL: | NA    |              | WATER FLOWING: YES/NO/NA |
| BOREHOLE:                   | YES/NO/NA |              |  | BOREHOLE DECLINATION:    | -90°  |              | BOREHOLE DIRECTION: NA   |

| # | PRIORITY | ORDER        | CNTNR        | PRESERVATIVE                     | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|----------|--------------|--------------|----------------------------------|---------------|----------------------|
| 1 | Normal   | METALS+U-GEL | 1 LITER POLY | Nitric Acid                      | Y             |                      |
| 1 |          | NO3NO2       | 250 ML POLY  | Sulfuric Acid (Hydrogen Sulfate) |               |                      |
| 1 |          | SW-846:6850  | 250 ML POLY  | Ice                              |               |                      |
| 1 |          | TCN          | 500 ML POLY  | Sodium Hydroxide                 |               |                      |

SAMPLE DESC: QC Sample of RE36-10-8487

SAMPLE COMMENTS: NA

LOCATION DESC: NA

## FIELD SCREENING/MEASUREMENT RESULTS:

1/26/10 JL  
Alpha = \_\_\_\_\_ dpm  
Beta/Gamma = \_\_\_\_\_ dpm

1/26/10 JL  
PID  $\frac{\text{Ambient Reading}}{\text{Reading}} = \text{ppm}$

COLLECTED BY (PRINT)

REVIEWED BY (PRINT)

|   |                               |  |                              |
|---|-------------------------------|--|------------------------------|
| RELINQUISHED BY<br>(Printed Name) JON MARIN<br>(Signature) Jon R. Marin | Date/Time<br>2/19/10<br>15:35 | RECEIVED BY<br>(Printed Name) Sheri Sherwood<br>(Signature) Sheri Sherwood | Date/Time<br>2/19/10<br>1535 |
| RELINQUISHED BY<br>(Printed Name)<br>(Signature)                        | Date/Time                     | RECEIVED BY<br>(Printed Name)<br>(Signature)                               | Date/Time                    |

## SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 2511

EVENT NAME: 4th Qtr. FY09 - SWMU 36-003(a) - Threemile Canyon

SAMPLE ID: RE36-10-8497

WORK ORDER:

| AS PLANNED                  | AS COLLECTED                | AS PLANNED               | AS COLLECTED |
|-----------------------------|-----------------------------|--------------------------|--------------|
| DATE COLLECTED(MM/DD/YYYY): | 02/19/2010                  | MEDIA:                   | NA           |
| TIME COLLECTED (HH:MM)      | 10:00                       | SUB-MEDIA:               | OTHER        |
| PRS ID: 36-003(a)           | OK                          | SAMPLE TECH CODE:        | DC           |
| LOCATION ID: LNK            | 36-610879                   | FIELD QC TYPE:           | FTB          |
| LOCATION TYPE: GENERIC      | OK                          | FIELD PREP:              | NA           |
| TOP DEPTH: 0                | I                           | SAMPLE USAGE:            | QC           |
| BOTTOM DEPTH: 0             | I                           | SCREEN/PORT DESC:        | NA           |
| FIELD MATRIX: S             | I                           | EXCAVATED: YES/NO/NA     | NA           |
| COMPOSITE TYPE: NA          | COMPOSITE TIME INTERVAL: NA | WATER FLOWING: YES/NO/NA | NA           |
| BOREHOLE: YES/NO/NA         | BOREHOLE DECLINATION: -90°  | BOREHOLE DIRECTION: NA   |              |

| # | PRIORITY | ORDER            | CNTNR                    | PRESERVATIVE | COLLECTED Y/N | SPECIAL INSTRUCTIONS |
|---|----------|------------------|--------------------------|--------------|---------------|----------------------|
| 1 | Normal   | 8260B Trip Blank | 40 ML SEPTUM AMBER GLASS | Ice          | Y             |                      |

SAMPLE DESC: QC Sample of RE36-10-8487

SAMPLE COMMENTS: NA

LOCATION DESC: 3a-6

FIELD SCREENING/MEASUREMENT RESULTS:

COLLECTED BY (PRINT)

JON MARIN

REVIEWED BY (PRINT)

LARRY A. COPEL

|                          |           |                                 |           |
|--------------------------|-----------|---------------------------------|-----------|
| RELINQUISHED BY          | Date/Time | RECEIVED BY                     | Date/Time |
| (Printed Name) JON MARIN | 2/19/10   | (Printed Name) Sherril Sherwood | 2/19/10   |
| (Signature) Jon Marin    | 15:35     | (Signature) Sherril Sherwood    | 1535      |
| RELINQUISHED BY          | Date/Time | RECEIVED BY                     | Date/Time |
| (Printed Name)           |           | (Printed Name)                  |           |
| (Signature)              |           | (Signature)                     |           |



133 State Road 4, White Rock, NM 87544  
505-672-2770 FAX 505-672-9534

ARS Sample Delivery Group: ARS2-10-00066  
Client Sample ID: RE36-10-8462  
Sample Collection Date: 02/19/10 08:10  
Sample Matrix: Soil/Solid

Request or PO Number:  
ARS Sample ID: ARS2-10-00066-001  
Date Received: 02/22/10 00:00  
Report Date: 02/23/10 11:46

| Analysis Description    | Analysis Results | Analysis Error +/- 1 s | MDC   | TPU    | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|-------------------------|------------------|------------------------|-------|--------|------|----------------|----------------------|--------------------|---------------------|----------------------|
| GROSS ALPHA             | 49.27            | 33.88                  | 37.46 | 34.41  |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| GROSS BETA              | 54.14            | 17.17                  | 18.42 | 18.40  |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| NA-22                   | -0.04            | 43.99                  | 0.14  | 43.99  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| K-40                    | 41.47            | 12.36                  | 1.52  | 12.42  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CO-60                   | 0.00             | 0.00                   | 0.15  | 0.00   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-134                  | 0.13             | 0.21                   | 0.21  | 0.21   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-137                  | 0.10             | 0.15                   | 0.08  | 0.15   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| EU-152                  | -0.89            | 170.28                 | 0.38  | 170.28 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| PB-212                  | 1.91             | 0.64                   | 0.18  | 0.64   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| RA-228                  | 1.56             | 1.10                   | 0.37  | 1.10   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-235                   | 1.76             | 1.28                   | 0.68  | 1.28   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-238                   | 6.99             | 5.99                   | 2.17  | 6.20   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| AM-241                  | 0.06             | 0.21                   | 0.12  | 0.21   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
|                         |                  |                        |       |        |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |        |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |        |      |                |                      |                    |                     |                      |
| NOTES: % Moisture: 0.17 |                  |                        |       |        |      |                |                      |                    |                     |                      |

*Matthew J. Eden*  
Quality Assurance Review

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LELAP Certificate# 30658

NELAP Certificate # E87558



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505-672-2770 FAX 505-672-9534

ARS Sample Delivery Group: ARS2-10-00066  
Client Sample ID: RE36-10-8463  
Sample Collection Date: 02/19/10 08:40  
Sample Matrix: Soil/Solid

Request or PO Number:  
ARS Sample ID: ARS2-10-00066-002  
Date Received: 02/22/10 00:00  
Report Date: 02/23/10 11:46

| Analysis Description    | Analysis Results | Analysis Error +/- 2 s | MDC   | TPU   | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|-------------------------|------------------|------------------------|-------|-------|------|----------------|----------------------|--------------------|---------------------|----------------------|
| GROSS ALPHA             | 48.67            | 31.53                  | 34.06 | 32.04 |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| GROSS BETA              | 58.70            | 17.48                  | 17.92 | 18.90 |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| NA-22                   | -0.04            | 43.17                  | 0.14  | 43.17 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| K-40                    | 32.56            | 10.85                  | 1.49  | 10.89 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CO-60                   | 0.00             | 0.00                   | 0.14  | 0.00  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-134                  | 0.27             | 0.24                   | 0.20  | 0.24  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-137                  | 0.02             | 0.04                   | 0.08  | 0.04  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| EU-152                  | -0.23            | -0.51                  | 0.37  | -0.51 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| PB-212                  | 1.36             | 0.62                   | 0.24  | 0.62  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| RA-228                  | 1.30             | 0.98                   | 0.36  | 0.98  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-235                   | 1.55             | 0.98                   | 0.59  | 0.98  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-238                   | 6.10             | 4.56                   | 1.82  | 4.77  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| AM-241                  | 0.17             | 0.31                   | 0.19  | 0.31  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
| NOTES: % Moisture: 0.27 |                  |                        |       |       |      |                |                      |                    |                     |                      |

*Matthew J. Edin*  
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133 State Road 4, White Rock, NM 87544  
505-672-2770 FAX 505-672-9534

ARS Sample Delivery Group: ARS2-10-00066

Request or PO Number:

Client Sample ID: RE36-10-8486

ARS Sample ID: ARS2-10-00066-010

Sample Collection Date: 02/19/10 09:07

Date Received: 02/22/10 00:00

Sample Matrix: Soil/Solid

Report Date: 02/23/10 11:46

| Analysis Description    | Analysis Results | Analysis Error +/- 2 s | MDC   | TPU    | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|-------------------------|------------------|------------------------|-------|--------|------|----------------|----------------------|--------------------|---------------------|----------------------|
| GROSS ALPHA             | 27.45            | 28.63                  | 34.06 | 29.18  |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| GROSS BETA              | 42.25            | 15.69                  | 17.92 | 16.52  |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| NA-22                   | -0.04            | 45.28                  | 0.14  | 45.28  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| K-40                    | 34.14            | 11.38                  | 1.56  | 11.42  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CO-60                   | 0.00             | 0.00                   | 0.15  | 0.00   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-134                  | 0.05             | 0.17                   | 0.10  | 0.17   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-137                  | 0.05             | 0.11                   | 0.09  | 0.11   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| EU-152                  | -0.61            | 175.26                 | 0.39  | 175.26 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| PB-212                  | 1.87             | 0.67                   | 0.22  | 0.67   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| RA-228                  | 2.41             | 1.03                   | 0.38  | 1.04   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-235                   | 0.42             | 0.84                   | 0.47  | 0.84   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-238                   | 3.99             | 4.14                   | 1.81  | 4.23   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| AM-241                  | 0.35             | 0.56                   | 0.21  | 0.56   |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
|                         |                  |                        |       |        |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |        |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |        |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |        |      |                |                      |                    |                     |                      |
| NOTES: % Moisture: 0.30 |                  |                        |       |        |      |                |                      |                    |                     |                      |

*Matthew J. Eder*  
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NELAP Certificate # E87558



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505-672-2770 FAX 505-672-9534

ARS Sample Delivery Group: ARS2-10-00066  
Client Sample ID: RE36-10-8487  
Sample Collection Date: 02/19/10 09:20  
Sample Matrix: Soil/Solid

Request or PO Number:  
ARS Sample ID: ARS2-10-00066-011  
Date Received: 02/22/10 00:00  
Report Date: 02/23/10 11:46

| Analysis Description    | Analysis Results | Analysis Error +/- 2 s | MDC   | TPU   | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|-------------------------|------------------|------------------------|-------|-------|------|----------------|----------------------|--------------------|---------------------|----------------------|
| GROSS ALPHA             | 17.26            | 21.39                  | 32.75 | 21.50 |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| GROSS BETA              | 50.65            | 16.77                  | 18.31 | 17.88 |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| NA-22                   | -0.05            | 47.03                  | 0.15  | 47.03 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| K-40                    | 37.44            | 12.15                  | 1.62  | 12.19 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CO-60                   | 0.00             | 0.00                   | 0.16  | 0.00  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-134                  | 0.27             | 0.19                   | 0.11  | 0.19  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-137                  | 0.00             | 0.00                   | 0.09  | 0.00  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| EU-152                  | 0.82             | 0.75                   | 0.41  | 0.75  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| PB-212                  | 1.69             | 0.61                   | 0.17  | 0.62  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| RA-228                  | 3.10             | 1.21                   | 0.39  | 1.22  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-235                   | 1.90             | 1.16                   | 0.66  | 1.16  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-238                   | 8.03             | 4.45                   | 1.51  | 4.81  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| AM-241                  | 0.10             | 0.17                   | 0.08  | 0.17  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
| NOTES: % Moisture: 0.49 |                  |                        |       |       |      |                |                      |                    |                     |                      |

*Matthew L. Eder*  
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NELAP Certificate # EB7558



133 State Road 4, White Rock, NM 87544

505-672-2770 FAX 505-672-9534

ARS Sample Delivery Group: ARS2-10-00066

Request or PO Number:

Client Sample ID: RE36-10-8489

ARS Sample ID: ARS2-10-00066-012

Sample Collection Date: 02/19/10 09:20

Date Received: 02/22/10 00:00

Sample Matrix: Soil/Solid

Report Date: 02/23/10 11:46

| Analysis Description    | Analysis Results | Analysis Error +/- 2 s | MDC   | TPU   | Qual | Analysis Units | Analysis Test Method | Analysis Date/Time | Analysis Technician | Tracer/Chem Recovery |
|-------------------------|------------------|------------------------|-------|-------|------|----------------|----------------------|--------------------|---------------------|----------------------|
| GROSS ALPHA             | 60.26            | 35.05                  | 33.91 | 35.81 |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| GROSS BETA              | 42.60            | 16.09                  | 17.73 | 16.92 |      | pCi/g          | EPA 900.0M           | 2/23/2010          | ME                  | N/A                  |
| NA-22                   | -0.04            | 43.04                  | 0.14  | 43.04 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| K-40                    | 32.46            | 10.82                  | 1.48  | 10.86 |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CO-60                   | 0.12             | 0.15                   | 0.14  | 0.15  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-134                  | 0.03             | 0.09                   | 0.19  | 0.09  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| CS-137                  | 0.00             | 0.00                   | 0.08  | 0.00  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| EU-152                  | 0.86             | 0.46                   | 0.39  | 0.46  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| PB-212                  | 1.73             | 0.75                   | 0.31  | 0.75  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| RA-226                  | 3.37             | 1.19                   | 0.36  | 1.20  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-235                   | 1.63             | 1.22                   | 0.45  | 1.22  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| U-238                   | 4.43             | 4.61                   | 1.93  | 4.72  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
| AM-241                  | 0.09             | 0.35                   | 0.17  | 0.35  |      | pCi/g          | EPA 901.1M           | 2/23/2010          | ME                  | N/A                  |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
|                         |                  |                        |       |       |      |                |                      |                    |                     |                      |
| NOTES: % Moisture: 0.56 |                  |                        |       |       |      |                |                      |                    |                     |                      |

*Matthew A. Eder*  
Quality Assurance Review

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LELAP Certificate# 30658

NELAP Certificate # E87558

## Rad Screening Data Release Form

The Following samples were received at the Field Support Facility (FSF) without screening data (list sample number):

RE36-10-8462  
-8486  
-8489  
-8487  
-8463

These samples will not be shipped until radiological screening data documentation arrives at the FSF. I understand that it is my responsibility to ensure this information arrives at the FSF in a timely manner. If holding times are missed because screening data does not arrive, I will pick up the samples.

.....  
The following samples do not require rad screening data for the reasons stated (list sample numbers):

RE36-10-8492 FR  
-8497 FTB

Reason:

.....  
Print Last Name MARIN

Signature

Jen R. Marin Date 2/19/10

| DATA VALIDATION COVER SHEET  |                          |
|--|--------------------------|
| <b>5119-1</b><br><br><div style="text-align: center;"><b>Data Validation Cover Sheet</b></div> | Records Use only<br><br> |

| Section I.  |  |  |  |                      |  |  |  |
|---|--|--|--|----------------------|--|--|--|
| REQUEST NUMBER: <u>10-2026</u>                        |  | VALIDATION DATE: <u>04/05/10</u>                         |  | LAB CODE: <u>GEL</u> |  |  |  |
| CONTRACT LABORATORY NAME: <u>GEL Laboratories LLC</u> |  |  |  |                      |  |  |  |
| VALIDATOR: <u>David Schwent</u>                       |  | ORGANIZATION: <u>Analytical Quality Associates, Inc.</u> |  |                      |  |  |  |
| ANALYTICAL SUITE (CHECK ALL THAT APPLY):              |  |  |  |                      |  |  |  |
| <input type="checkbox"/> TPH-GRO                      | <input type="checkbox"/> HIGH EXPLOSIVES           | <input type="checkbox"/> DIOXIN FURANS                   | <input type="checkbox"/> LCMSMS PERCHLORATES                                 |                      |  |  |  |
| <input type="checkbox"/> TPH-DRO                      | <input type="checkbox"/> METALS                    | <input type="checkbox"/> PCB CONGENERS                   | <input type="checkbox"/> ORGANOCHLORINE PESTICIDES/POLYCHLORINATED BIPHENYLS |                      |  |  |  |
| <input type="checkbox"/> GENERAL CHEMISTRY            | <input checked="" type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH EXPLOSIVES          |  |                      |  |  |  |
| <input type="checkbox"/> OTHER (DESCRIBE): _____      |  |  |  |                      |  |  |  |


  


| Section II. Completeness Check      |                          |                                     |                             |                                     |                          |                                     |                          |
|-------------------------------------|--------------------------|-------------------------------------|-----------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| YES                                 | NO                       | N/A                                 | (CHECK ONE)                 | YES                                 | NO                       | N/A                                 | (CHECK ONE)              |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 1. CHAIN-OF-CUSTODY FORM(S) | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 6. RAW/BSS DATA          |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 2. CASE NARRATIVE           | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 7. QUALITY CONTROL FORMS |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>            | 3. SAMPLE RESULT FORMS      | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 8. QUANTITATION REPORTS  |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 4. SAMPLE CHROMATOGRAMS     | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 9. TICS FORMS            |
| <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 5. STANDARD CHROMATOGRAMS   | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10. TICS MASS SPECTRA    |

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact):


1. All reported sample results that were rejected by the laboratory due to interference or low abundance were qualified R,R5a. In the QC samples, several results were also rejected by the laboratory. No sample data were qualified as a result.
2. It should be noted that no MS analysis was performed for the tritium analysis. However, an LCS analysis was performed and was within acceptance limits. No sample data were qualified as a result.
3. It should be noted that the matrix QC analyses for all analyses in this RN were performed on LANL samples from other RNs. No sample data were qualified as a result.

Reviewed by: ETM Level: 1 Date: 4/6/10

| DATA VALIDATION COVER SHEET  |   |
|--|---|
| 5119-1<br><br>Data Validation Cover Sheet                          | Records Use only<br><br><br>Los Alamos<br>NATIONAL LABORATORY<br>EST. 1947 |
|  |   |
| VALIDATOR'S SIGNATURE: <u>David Schwartz</u> DATE: <u>04/05/10</u> |   |
| Form 5119-1, Revision 0.0  | LOS ALAMOS<br>Environmental Restoration Project   |


| RAD ANALYTICAL DATA VALIDATION CHECKLIST                             |   |
|--|---|
| <b>5119-2</b><br><br><b>Rad Analytical Data Validation Checklist</b> | Records Use only<br><br> |

| Yes No N/A                          |                                     |                                     |   | Assign Qualifier Listed Below If<br>Criterion = Yes |                     |
|-------------------------------------|-------------------------------------|-------------------------------------|---|---|---------------------|
| (Check One)                         |                                     |                                     |   | Non-detected<br>Analyte                             | Detected<br>Analyte |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 1. The holding time was >1 and ≤2 times the applicable holding time requirement.  | UJ, R9  | J-, R9              |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 2. The holding time was >2 times the applicable holding time requirement.   | R, R9a  | J-, R9a             |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 3. The results for the affected analytes are considered not detected (U) because the associated sample concentration was less than or equal to the MDC.       | U, R5   | N/A                 |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 4. The analyte should be regarded as rejected because spectral interferences prevent positive identification of the analytes.                                 | R, R5a  | R, R5a              |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 5. The MDC and/or TPU documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.                   | R, R5b  | J-, R5b             |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 6. The results for the affected analytes should be regarded as not detected (U) because the associated sample concentration was less than 3X the 1 sigma TPU. | U, R11  | N/A                 |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 7. The sample result is ≤5X the concentration of the related analyte in the method blank.   | U, R4   | N/A                 |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 8. The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5X.                        | N/A   | J, R4a              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 9. The sample result is ≤5X the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.                                    | U, R4d  | N/A                 |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 10. Required method blank information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.                 | R, R4e  | R, R4e              |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 11. The tracer is <10%R. Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy. | R, R3   | R, R3               |

| RAD ANALYTICAL DATA VALIDATION CHECKLIST  |                  |
|---|------------------|
| 5119-2  | Records Use only |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <div>Rad Analytical Data Validation Checklist</div> <div>  </div> </div> |                  |

| Yes No N/A               |                                     |                          |   | Assign Qualifier Listed Below If<br>Criterion = Yes |                     |
|--------------------------|-------------------------------------|--------------------------|---|---|---------------------|
| (Check One)              |                                     |                          |   | Non-detected<br>Analyte                             | Detected<br>Analyte |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 12. The tracer is < the Lower Acceptance Level (LAL) but $\geq 10\%R$ . Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.                          | UJ, R3a   | J-, R3a             |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 13. The Tracer%R value is > the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.                                    | N/A   | J+, R3b             |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 14. Required tracer information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. Tracer%R is not applicable for Gamma Spectroscopy.  | R, R3d  | R, R3d              |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 15. The LCS percent recovery was <10%. Follow the external laboratory limits located within the associated data package.  | R, R12  | R, R12              |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 16. The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.  | UJ, R12a  | J-, R12a            |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 17. The LCS percent recovery was > the UAL. Follow the external laboratory limits located within the associated data package.   | N/A   | J+, R12b            |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 18. The LCS documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.   | R, R12c   | R, R12c             |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 19. Associated duplicate sample has DER or RER > the analytical laboratory's acceptance limits.   | R, R10  | J, J10              |
| <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 20. The duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons. The duplicate information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. | R, R6   | R, R6               |



| RAD ANALYTICAL DATA VALIDATION CHECKLIST                             |   |
|--|---|
| <b>5119-2</b><br><br><b>Rad Analytical Data Validation Checklist</b> | Records Use only<br><br> |

| Yes No N/A                          |                                     |                                     |  | Assign Qualifier Listed Below If Criterion = Yes |                    |
|-------------------------------------|-------------------------------------|-------------------------------------|--|--|--------------------|
| (Check One)                         |                                     |                                     |  | Non-detected Analyte                             | Detected Analyte   |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 21. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.  | R, R6  | R, R6              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 22. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.  | UJ, R6a  | J-, R6a            |
| <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | 23. The associated matrix spike recovery was above the UAL. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.   | UJ, R6b  | J+, R6b            |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 24. Required matrix spike information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. If LCS information is present, do not Reject. Qualify data based on LCS information. MS/MSD is not applicable to Gamma Spectroscopy. | R, R6c   | R, R6c             |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 25. Duplicate, dilution, or reanalysis.  | UJ, R88  | J, R88             |
| <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | 26. The LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used and/or under advisement by the LANL project chemist.  | UJ, R, R19                                       | J, R, R19          |
| <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | 27. Quantification of data via data validation did not occur based on Quality Control requirements in this procedure. Adhere to the external laboratory qualifiers found within the Form I analytical data summary sheets generated by the external laboratory.                    | U, U_LAB   | J, J_LAB<br>NQ, NQ |

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## Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8489  
Sample ID: 247964001  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 4.81%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result   | DL     | TPU        | RL        | Units | DF | Analyst | Date     | Time Batch  | Mtd. |
|--|-----------|----------|--------|------------|-----------|-------|----|---------|----------|-------------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |          |        |            |           |       |    |         |          |             |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |          |        |            |           |       |    |         |          |             |      |
| Americium-241                            | U         | 0.0014   | 0.0207 | +/-0.00211 | 0.050     | pCi/g |    | JXH2    | 03/22/10 | 1114 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |          |        |            |           |       |    |         |          |             |      |
| Plutonium-238                            | U         | 0.00291  | 0.0197 | +/-0.00484 | 0.050     | pCi/g |    | JXH2    | 03/22/10 | 2224 962402 | 2    |
| Plutonium-239/240                        | U         | 0.000178 | 0.0166 | +/-0.00334 | 0.050     | pCi/g |    |         |          |             |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |          |        |            |           |       |    |         |          |             |      |
| Uranium-233/234                          |           | 1.47     | 0.112  | +/-0.131   | 0.100     | pCi/g |    | JXH2    | 03/22/10 | 2119 962404 | 3    |
| Uranium-235/236                          | U         | 0.0489   | 0.0682 | +/-0.0159  | 0.100     | pCi/g |    |         |          |             |      |
| Uranium-238                              |           | 1.40     | 0.0785 | +/-0.126   | 0.100     | pCi/g |    |         |          |             |      |
| <b>Rad Gamma Spec Analysis</b>           |           |          |        |            |           |       |    |         |          |             |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |          |        |            |           |       |    |         |          |             |      |
| Americium-241                            | U         | 0.0447   | 0.266  | +/-0.0792  | 0.200     | pCi/g |    | MXR1    | 03/10/10 | 2117 958216 | 4    |
| Bismuth-211                              | UI        | 6.26     | R,R5a  | 0.333      | +/-0.417  | pCi/g |    |         |          |             |      |
| Bismuth-214                              |           | 1.91     |        | 0.110      | +/-0.135  | pCi/g |    |         |          |             |      |
| Cadmium-109                              | UI        | 5.44     | R,R5a  | 1.24       | +/-0.646  | pCi/g |    |         |          |             |      |
| Cerium-139                               | U         | -0.0167  |        | 0.0499     | +/-0.0148 | pCi/g |    |         |          |             |      |
| Cesium-134                               | U         | 0.102    |        | 0.103      | +/-0.0328 | pCi/g |    |         |          |             |      |
| Cesium-137                               | U         | -0.0305  |        | 0.0576     | +/-0.0188 | pCi/g |    |         |          |             |      |
| Cobalt-60                                | U         | 0.0402   |        | 0.0679     | +/-0.0187 | pCi/g |    |         |          |             |      |
| Europium-152                             | U         | -0.0538  |        | 0.154      | +/-0.0471 | pCi/g |    |         |          |             |      |
| Lanthanum-140                            | U         | 0.033    |        | 0.168      | +/-0.055  | pCi/g |    |         |          |             |      |
| Lead-212                                 |           | 2.58     |        | 0.0963     | +/-0.166  | pCi/g |    |         |          |             |      |
| Lead-214                                 |           | 2.27     |        | 0.122      | +/-0.164  | pCi/g |    |         |          |             |      |
| Mercury-203                              | UI        | 0.0828   | R,R5a  | 0.0669     | +/-0.0376 | pCi/g |    |         |          |             |      |
| Potassium-40                             |           | 37.6     |        | 0.574      | +/-1.91   | pCi/g |    |         |          |             |      |
| Radium-223                               | U         | 0.292    |        | 1.07       | +/-0.360  | pCi/g |    |         |          |             |      |
| Radium-224                               | UI        | 8.17     | R,R5a  | 1.03       | +/-0.819  | pCi/g |    |         |          |             |      |
| Radium-226                               |           | 1.91     |        | 0.110      | +/-0.135  | pCi/g |    |         |          |             |      |
| Radium-228                               |           | 2.47     |        | 0.230      | +/-0.229  | pCi/g |    |         |          |             |      |
| Ruthenium-106                            | U         | -0.163   |        | 0.499      | +/-0.157  | pCi/g |    |         |          |             |      |
| Sodium-22                                | U         | -0.0211  |        | 0.071      | +/-0.0228 | pCi/g |    |         |          |             |      |
| Strontium-85                             | U         | 0.0237   |        | 0.0666     | +/-0.0215 | pCi/g |    |         |          |             |      |

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID:  
Sample ID:

RE36-10-8489  
247964001

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU       | RL    | Units | DF | Analyst | Date | Time Batch | Mtd. |
|--|-----------|---------|--------|-----------|-------|-------|----|---------|------|------------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |           |       |       |    |         |      |            |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |        |           |       |       |    |         |      |            |      |
| Thallium-208                             |           | 0.844   | 0.0601 | +/-0.062  | 0.080 | pCi/g |    |         |      |            |      |
| Thorium-227                              | U         | -0.107  | 0.423  | +/-0.130  |       | pCi/g |    |         |      |            |      |
| Thorium-231                              | U         | 0.292   | 1.07   | +/-0.360  |       | pCi/g |    |         |      |            |      |
| Thorium-234                              | U         | 1.40    | 2.45   | +/-0.721  | 2.00  | pCi/g |    |         |      |            |      |
| Tin-113                                  | U         | -0.0398 | 0.0736 | +/-0.0225 | 0.100 | pCi/g |    |         |      |            |      |
| Uranium-235                              | UI        | 0.390   | R,R5a  | +/-0.143  | 0.500 | pCi/g |    |         |      |            |      |
| Yttrium-88                               | U         | 0.028   | 0.0651 | +/-0.0176 | 0.100 | pCi/g |    |         |      |            |      |

### **Rad Liquid Scintillation Analysis**

*H3 "As Received"*

|         |   |     |     |         |     |       |      |          |      |        |   |
|---------|---|-----|-----|---------|-----|-------|------|----------|------|--------|---|
| Tritium | U | 137 | 181 | +/-56.6 | 250 | pCi/L | KXK2 | 03/19/10 | 1445 | 964049 | 5 |
|---------|---|-----|-----|---------|-----|-------|------|----------|------|--------|---|

### **The following Analytical Methods were performed**

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery % | Acceptable Limits |
|---------------------------|------------------------------|------------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 90.9       | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 93.7       | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 86.3       | (50%-105%)        |

### **Notes:**

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8486  
Sample ID: 247964002  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 3.41%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result    | DL     | TPU        | RL        | Units | DF    | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|-----------|--------|------------|-----------|-------|-------|---------|----------|------|--------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |           |        |            |           |       |       |         |          |      |        |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |           |        |            |           |       |       |         |          |      |        |      |
| Americium-241                            | U         | -0.00182  | 0.0216 | +/-0.00148 | 0.050     | pCi/g |       | JXH2    | 03/22/10 | 1114 | 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |           |        |            |           |       |       |         |          |      |        |      |
| Plutonium-238                            | U         | 0.0149    | 0.021  | +/-0.00979 | 0.050     | pCi/g |       | JXH2    | 03/22/10 | 2224 | 962402 | 2    |
| Plutonium-239/240                        | U         | -0.000506 | 0.0178 | +/-0.00422 | 0.050     | pCi/g |       |         |          |      |        |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |           |        |            |           |       |       |         |          |      |        |      |
| Uranium-233/234                          |           | 1.56      | 0.109  | +/-0.137   | 0.100     | pCi/g |       | JXH2    | 03/22/10 | 2119 | 962404 | 3    |
| Uranium-235/236                          |           | 0.0762    | 0.0664 | +/-0.0198  | 0.100     | pCi/g |       |         |          |      |        |      |
| Uranium-238                              |           | 1.41      | 0.0764 | +/-0.126   | 0.100     | pCi/g |       |         |          |      |        |      |
| <b>Rad Gamma Spec Analysis</b>           |           |           |        |            |           |       |       |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |           |        |            |           |       |       |         |          |      |        |      |
| Americium-241                            | U         | -0.0476   | 0.0858 | +/-0.0286  | 0.200     | pCi/g |       | MXR1    | 03/10/10 | 2117 | 958216 | 4    |
| Bismuth-211                              | UI        | 6.74      | R,R5a  | 0.328      | +/-0.443  | pCi/g |       |         |          |      |        |      |
| Bismuth-214                              |           | 2.10      |        | 0.121      | +/-0.163  | 0.200 | pCi/g |         |          |      |        |      |
| Cadmium-109                              | UI        | 6.00      | R,R5a  | 0.774      | +/-0.503  | pCi/g |       |         |          |      |        |      |
| Cerium-139                               | U         | -0.0221   | 0.0444 | +/-0.0134  | 0.050     | pCi/g |       |         |          |      |        |      |
| Cesium-134                               | UI        | 0.137     | R,R5a  | 0.110      | +/-0.0395 | 0.100 | pCi/g |         |          |      |        |      |
| Cesium-137                               | U         | 0.0042    | 0.0858 | +/-0.0243  | 0.100     | pCi/g |       |         |          |      |        |      |
| Cobalt-60                                | U         | -0.0128   | 0.085  | +/-0.0264  | 0.100     | pCi/g |       |         |          |      |        |      |
| Europium-152                             | U         | 0.00603   | 0.165  | +/-0.0512  | 0.200     | pCi/g |       |         |          |      |        |      |
| Lanthanum-140                            | U         | -0.0855   | 0.160  | +/-0.0545  | pCi/g     |       |       |         |          |      |        |      |
| Lead-212                                 |           | 2.60      | 0.0867 | +/-0.161   | 0.100     | pCi/g |       |         |          |      |        |      |
| Lead-214                                 |           | 2.45      | 0.119  | +/-0.174   | 0.100     | pCi/g |       |         |          |      |        |      |
| Mercury-203                              | U         | 0.00796   | 0.0718 | +/-0.0244  | 0.100     | pCi/g |       |         |          |      |        |      |
| Potassium-40                             |           | 39.0      | 0.468  | +/-1.94    | 1.00      | pCi/g |       |         |          |      |        |      |
| Radium-223                               | U         | -0.0827   | 1.04   | +/-0.343   | pCi/g     |       |       |         |          |      |        |      |
| Radium-224                               | UI        | 7.93      | R,R5a  | 0.930      | +/-0.820  | pCi/g |       |         |          |      |        |      |
| Radium-226                               |           | 2.10      | 0.121  | +/-0.163   | pCi/g     |       |       |         |          |      |        |      |
| Radium-228                               |           | 2.78      | 0.230  | +/-0.239   | 0.500     | pCi/g |       |         |          |      |        |      |
| Ruthenium-106                            | U         | -0.0604   | 0.543  | +/-0.161   | 0.800     | pCi/g |       |         |          |      |        |      |
| Sodium-22                                | U         | -0.00188  | 0.0868 | +/-0.0263  | 0.080     | pCi/g |       |         |          |      |        |      |
| Strontium-85                             | U         | 0.0625    | 0.0755 | +/-0.0236  | pCi/g     |       |       |         |          |      |        |      |
| Thallium-208                             |           | 0.785     | 0.068  | +/-0.0675  | 0.080     | pCi/g |       |         |          |      |        |      |

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8486  
Sample ID: 247964002

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|--------|-----------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |           |       |       |    |         |          |      |        |      |
| GAMMA SPEC "Dry Weight Corrected"        |           |         |        |           |       |       |    |         |          |      |        |      |
| Thorium-227                              | U         | -0.0777 | 0.400  | +/-0.123  |       | pCi/g |    |         |          |      |        |      |
| Thorium-231                              | U         | -0.0827 | 1.04   | +/-0.343  |       | pCi/g |    |         |          |      |        |      |
| Thorium-234                              |           | 2.61    | 0.867  | +/-0.540  | 2.00  | pCi/g |    |         |          |      |        |      |
| Tin-113                                  | U         | 0.0074  | 0.079  | +/-0.023  | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-235                              | U         | 0.144   | 0.327  | +/-0.0932 | 0.500 | pCi/g |    |         |          |      |        |      |
| Yttrium-88                               | U         | 0.0382  | 0.0699 | +/-0.0186 | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |         |        |           |       |       |    |         |          |      |        |      |
| H3 "As Received"                         |           |         |        |           |       |       |    |         |          |      |        |      |
| Tritium                                  | U         | -18.1   | 176    | +/-48.5   | 250   | pCi/L |    | KXX2    | 03/15/10 | 1024 | 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery% | Acceptable Limits |
|---------------------------|------------------------------|-----------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 85.7      | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 94.0      | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 89.4      | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded

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Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8487  
Sample ID: 247964003  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 5.4%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  |       | DL     | TPU        | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|-------|--------|------------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |         |       |        |            |       |       |    |         |          |      |        |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |         |       |        |            |       |       |    |         |          |      |        |      |
| Americium-241                            | U         | 0.00218 |       | 0.0195 | +/-0.00171 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 1114 | 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |         |       |        |            |       |       |    |         |          |      |        |      |
| Plutonium-238                            | U         | 0.00386 |       | 0.020  | +/-0.00339 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 2224 | 962402 | 2    |
| Plutonium-239/240                        | U         | 0.00193 |       | 0.0169 | +/-0.00239 | 0.050 | pCi/g |    |         |          |      |        |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |         |       |        |            |       |       |    |         |          |      |        |      |
| Uranium-233/234                          |           | 1.40    |       | 0.0992 | +/-0.123   | 0.100 | pCi/g |    | JXH2    | 03/22/10 | 2119 | 962404 | 3    |
| Uranium-235/236                          |           | 0.0957  |       | 0.0606 | +/-0.0224  | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-238                              |           | 1.40    |       | 0.0698 | +/-0.123   | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Gamma Spec Analysis</b>           |           |         |       |        |            |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |       |        |            |       |       |    |         |          |      |        |      |
| Americium-241                            | UI        | 0.116   | R,R5a | 0.0992 | +/-0.0313  | 0.200 | pCi/g |    | MXR1    | 03/10/10 | 2308 | 958216 | 4    |
| Bismuth-211                              | UI        | 6.26    | R,R5a | 0.306  | +/-0.330   |       | pCi/g |    |         |          |      |        |      |
| Bismuth-214                              |           | 2.05    |       | 0.105  | +/-0.119   | 0.200 | pCi/g |    |         |          |      |        |      |
| Cadmium-109                              | UI        | 5.88    | R,R5a | 0.867  | +/-0.445   |       | pCi/g |    |         |          |      |        |      |
| Cerium-139                               | U         | 0.00166 |       | 0.0466 | +/-0.0139  | 0.050 | pCi/g |    |         |          |      |        |      |
| Cesium-134                               | UI        | 0.131   | R,R5a | 0.0886 | +/-0.0343  | 0.100 | pCi/g |    |         |          |      |        |      |
| Cesium-137                               | U         | -0.0138 |       | 0.0592 | +/-0.0185  | 0.100 | pCi/g |    |         |          |      |        |      |
| Cobalt-60                                | U         | 0.0214  |       | 0.0608 | +/-0.018   | 0.100 | pCi/g |    |         |          |      |        |      |
| Europium-152                             | U         | -0.0853 |       | 0.147  | +/-0.0783  | 0.200 | pCi/g |    |         |          |      |        |      |
| Lanthanum-140                            | U         | 0.141   |       | 0.170  | +/-0.050   |       | pCi/g |    |         |          |      |        |      |
| Lead-212                                 |           | 2.57    |       | 0.0833 | +/-0.149   | 0.100 | pCi/g |    |         |          |      |        |      |
| Lead-214                                 |           | 2.27    |       | 0.105  | +/-0.135   | 0.100 | pCi/g |    |         |          |      |        |      |
| Mercury-203                              | U         | 0.0465  |       | 0.0628 | +/-0.0201  | 0.100 | pCi/g |    |         |          |      |        |      |
| Potassium-40                             |           | 35.5    |       | 0.505  | +/-1.33    | 1.00  | pCi/g |    |         |          |      |        |      |
| Radium-223                               | U         | -0.167  |       | 0.954  | +/-0.326   |       | pCi/g |    |         |          |      |        |      |
| Radium-224                               | UI        | 7.22    | R,R5a | 0.892  | +/-0.650   |       | pCi/g |    |         |          |      |        |      |
| Radium-226                               |           | 2.05    |       | 0.105  | +/-0.119   |       | pCi/g |    |         |          |      |        |      |
| Radium-228                               |           | 2.71    |       | 0.217  | +/-0.225   | 0.500 | pCi/g |    |         |          |      |        |      |
| Ruthenium-106                            | U         | 0.275   |       | 0.519  | +/-0.152   | 0.800 | pCi/g |    |         |          |      |        |      |
| Sodium-22                                | U         | -0.0139 |       | 0.0696 | +/-0.0219  | 0.080 | pCi/g |    |         |          |      |        |      |
| Strontium-85                             | UI        | 0.083   | R,R5a | 0.0638 | +/-0.020   |       | pCi/g |    |         |          |      |        |      |
| Thallium-208                             |           | 0.847   |       | 0.0543 | +/-0.0481  | 0.080 | pCi/g |    |         |          |      |        |      |

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8487  
Sample ID: 247964003  
Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result   | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time Batch  | Mtd. |
|--|-----------|----------|--------|-----------|-------|-------|----|---------|----------|-------------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |          |        |           |       |       |    |         |          |             |      |
| GAMMA SPEC "Dry Weight Corrected"        |           |          |        |           |       |       |    |         |          |             |      |
| Thorium-227                              | U         | 0.057    | 0.385  | +/-0.111  |       | pCi/g |    |         |          |             |      |
| Thorium-231                              | U         | -0.167   | 0.954  | +/-0.326  |       | pCi/g |    |         |          |             |      |
| Thorium-234                              |           | 1.61     | 0.990  | +/-0.434  | 2.00  | pCi/g |    |         |          |             |      |
| Tin-113                                  | U         | -0.00234 | 0.0704 | +/-0.0209 | 0.100 | pCi/g |    |         |          |             |      |
| Uranium-235                              | U         | 0.265    | 0.318  | +/-0.0947 | 0.500 | pCi/g |    |         |          |             |      |
| Yttrium-88                               | U         | 0.0161   | 0.0521 | +/-0.0149 | 0.100 | pCi/g |    |         |          |             |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |          |        |           |       |       |    |         |          |             |      |
| H3 "As Received"                         |           |          |        |           |       |       |    |         |          |             |      |
| Tritium                                  | U         | -8.27    | 178    | +/-49.3   | 250   | pCi/L |    | KXK2    | 03/15/10 | 1102 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery% | Acceptable Limits |
|---------------------------|------------------------------|-----------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 94.0      | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 99.0      | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 96.9      | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8462  
Sample ID: 247964004  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 1.51%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU        | RL        | Units | DF    | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|--------|------------|-----------|-------|-------|---------|----------|------|--------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |         |        |            |           |       |       |         |          |      |        |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |         |        |            |           |       |       |         |          |      |        |      |
| Americium-241                            | U         | 0.0025  | 0.0211 | +/-0.0019  | 0.050     | pCi/g |       | JXH2    | 03/22/10 | 0305 | 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |         |        |            |           |       |       |         |          |      |        |      |
| Plutonium-238                            | U         | 0.00943 | 0.0252 | +/-0.00704 | 0.050     | pCi/g |       | JXH2    | 03/22/10 | 2224 | 962402 | 2    |
| Plutonium-239/240                        | U         | 0.00433 | 0.0213 | +/-0.00357 | 0.050     | pCi/g |       |         |          |      |        |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |         |        |            |           |       |       |         |          |      |        |      |
| Uranium-233/234                          |           | 1.16    | 0.100  | +/-0.105   | 0.100     | pCi/g |       | JXH2    | 03/22/10 | 2119 | 962404 | 3    |
| Uranium-235/236                          | U         | 0.0439  | 0.0611 | +/-0.0155  | 0.100     | pCi/g |       |         |          |      |        |      |
| Uranium-238                              |           | 1.26    | 0.0703 | +/-0.113   | 0.100     | pCi/g |       |         |          |      |        |      |
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |            |           |       |       |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |        |            |           |       |       |         |          |      |        |      |
| Americium-241                            | U         | -0.0424 | 0.0916 | +/-0.0299  | 0.200     | pCi/g |       | MXR1    | 03/10/10 | 2309 | 958216 | 4    |
| Bismuth-211                              | UI        | 5.60    | R,R5a  | 0.324      | +/-0.333  | pCi/g |       |         |          |      |        |      |
| Bismuth-214                              |           | 1.92    |        | 0.118      | +/-0.129  | 0.200 | pCi/g |         |          |      |        |      |
| Cadmium-109                              | UI        | 4.96    | R,R5a  | 0.872      | +/-0.419  | pCi/g |       |         |          |      |        |      |
| Cerium-139                               | U         | -0.0279 |        | 0.0439     | +/-0.0129 | 0.050 | pCi/g |         |          |      |        |      |
| Cesium-134                               | UI        | 0.172   | R,R5a  | 0.0923     | +/-0.0477 | 0.100 | pCi/g |         |          |      |        |      |
| Cesium-137                               | U         | -0.0406 |        | 0.0577     | +/-0.0199 | 0.100 | pCi/g |         |          |      |        |      |
| Cobalt-60                                | U         | 0.0225  |        | 0.0682     | +/-0.0198 | 0.100 | pCi/g |         |          |      |        |      |
| Europium-152                             | U         | -0.0145 |        | 0.151      | +/-0.0528 | 0.200 | pCi/g |         |          |      |        |      |
| Lanthanum-140                            | U         | 0.0109  |        | 0.189      | +/-0.0573 | pCi/g |       |         |          |      |        |      |
| Lead-212                                 |           | 2.38    |        | 0.0835     | +/-0.133  | 0.100 | pCi/g |         |          |      |        |      |
| Lead-214                                 |           | 2.03    |        | 0.118      | +/-0.133  | 0.100 | pCi/g |         |          |      |        |      |
| Mercury-203                              | U         | 0.0629  |        | 0.0647     | +/-0.0208 | 0.100 | pCi/g |         |          |      |        |      |
| Potassium-40                             |           | 35.1    |        | 0.584      | +/-1.74   | 1.00  | pCi/g |         |          |      |        |      |
| Radium-223                               | U         | -0.131  |        | 0.978      | +/-0.350  | pCi/g |       |         |          |      |        |      |
| Radium-224                               | UI        | 5.46    | R,R5a  | 0.895      | +/-0.539  | pCi/g |       |         |          |      |        |      |
| Radium-226                               |           | 1.92    |        | 0.118      | +/-0.129  | pCi/g |       |         |          |      |        |      |
| Radium-228                               |           | 2.71    |        | 0.238      | +/-0.226  | 0.500 | pCi/g |         |          |      |        |      |
| Ruthenium-106                            | U         | -0.193  |        | 0.498      | +/-0.155  | 0.800 | pCi/g |         |          |      |        |      |
| Sodium-22                                | U         | 0.0143  |        | 0.0736     | +/-0.0216 | 0.080 | pCi/g |         |          |      |        |      |
| Strontium-85                             | UI        | 0.121   | R,R5a  | 0.0725     | +/-0.0225 | pCi/g |       |         |          |      |        |      |
| Thallium-208                             |           | 0.775   |        | 0.0573     | +/-0.0536 | 0.080 | pCi/g |         |          |      |        |      |



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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID:  
Sample ID:

RE36-10-8462  
247964004

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|--------|-----------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |           |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |        |           |       |       |    |         |          |      |        |      |
| Thorium-227                              | U         | 0.244   | 0.382  | +/-0.110  |       | pCi/g |    |         |          |      |        |      |
| Thorium-231                              | U         | -0.131  | 0.978  | +/-0.350  |       | pCi/g |    |         |          |      |        |      |
| Thorium-234                              |           | 2.45    | 0.919  | +/-0.527  | 2.00  | pCi/g |    |         |          |      |        |      |
| Tin-113                                  | U         | -0.0107 | 0.0718 | +/-0.0209 | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-235                              | U         | 0.0302  | 0.305  | +/-0.0887 | 0.500 | pCi/g |    |         |          |      |        |      |
| Yttrium-88                               | U         | 0.00844 | 0.0562 | +/-0.0164 | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |         |        |           |       |       |    |         |          |      |        |      |
| <i>H3 "As Received"</i>                  |           |         |        |           |       |       |    |         |          |      |        |      |
| Tritium                                  | U         | 93.2    | 158    | +/-48.9   | 250   | pCi/L |    | KXK2    | 03/22/10 | 1753 | 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery% | Acceptable Limits |
|---------------------------|------------------------------|-----------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 90.8      | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 88.8      | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 95.8      | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8463  
Sample ID: 247964005  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 2.73%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result   | DL           | TPU        | RL    | Units | DF | Analyst | Date     | Time Batch  | Mtd. |
|--|-----------|----------|--------------|------------|-------|-------|----|---------|----------|-------------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |          |              |            |       |       |    |         |          |             |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |          |              |            |       |       |    |         |          |             |      |
| Americium-241                            | U         | 0.00178  | 0.0206       | +/-0.00272 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 0305 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |          |              |            |       |       |    |         |          |             |      |
| Plutonium-238                            | U         | -0.00443 | 0.0223       | +/-0.00586 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 2224 962402 | 2    |
| Plutonium-239/240                        | U         | 0.00717  | 0.0188       | +/-0.00396 | 0.050 | pCi/g |    |         |          |             |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |          |              |            |       |       |    |         |          |             |      |
| Uranium-233/234                          |           | 1.24     | 0.0958       | +/-0.110   | 0.100 | pCi/g |    | JXH2    | 03/22/10 | 2119 962404 | 3    |
| Uranium-235/236                          |           | 0.0714   | 0.0585       | +/-0.019   | 0.100 | pCi/g |    |         |          |             |      |
| Uranium-238                              |           | 1.20     | 0.0673       | +/-0.107   | 0.100 | pCi/g |    |         |          |             |      |
| <b>Rad Gamma Spec Analysis</b>           |           |          |              |            |       |       |    |         |          |             |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |          |              |            |       |       |    |         |          |             |      |
| Americium-241                            | U         | 0.296    | 0.424        | +/-0.136   | 0.200 | pCi/g |    | MXR1    | 03/10/10 | 2310 958216 | 4    |
| Bismuth-211                              | UI        | 6.50     | R,R5a 0.338  | +/-0.391   |       | pCi/g |    |         |          |             |      |
| Bismuth-214                              |           | 1.89     | 0.109        | +/-0.122   | 0.200 | pCi/g |    |         |          |             |      |
| Cadmium-109                              | UI        | 4.72     | R,R5a 1.36   | +/-0.583   |       | pCi/g |    |         |          |             |      |
| Cerium-139                               | U         | -0.014   | 0.0532       | +/-0.0163  | 0.050 | pCi/g |    |         |          |             |      |
| Cesium-134                               | UI        | 0.121    | R,R5a 0.0892 | +/-0.0254  | 0.100 | pCi/g |    |         |          |             |      |
| Cesium-137                               | U         | -0.0275  | 0.0559       | +/-0.0172  | 0.100 | pCi/g |    |         |          |             |      |
| Cobalt-60                                | U         | 0.0216   | 0.0643       | +/-0.0191  | 0.100 | pCi/g |    |         |          |             |      |
| Europium-152                             | U         | -0.0271  | 0.162        | +/-0.0534  | 0.200 | pCi/g |    |         |          |             |      |
| Lanthanum-140                            | U         | 0.103    | 0.162        | +/-0.0494  |       | pCi/g |    |         |          |             |      |
| Lead-212                                 |           | 2.58     | 0.096        | +/-0.165   | 0.100 | pCi/g |    |         |          |             |      |
| Lead-214                                 |           | 2.36     | 0.122        | +/-0.156   | 0.100 | pCi/g |    |         |          |             |      |
| Mercury-203                              | UI        | 0.0988   | R,R5a 0.0777 | +/-0.0247  | 0.100 | pCi/g |    |         |          |             |      |
| Potassium-40                             |           | 36.1     | 0.502        | +/-1.96    | 1.00  | pCi/g |    |         |          |             |      |
| Radium-223                               | U         | 0.528    | 1.10         | +/-0.363   |       | pCi/g |    |         |          |             |      |
| Radium-224                               | UI        | 6.50     | R,R5a 1.03   | +/-0.713   |       | pCi/g |    |         |          |             |      |
| Radium-226                               |           | 1.89     | 0.109        | +/-0.122   |       | pCi/g |    |         |          |             |      |
| Radium-228                               |           | 2.67     | 0.216        | +/-0.215   | 0.500 | pCi/g |    |         |          |             |      |
| Ruthenium-106                            | U         | 0.0196   | 0.507        | +/-0.155   | 0.800 | pCi/g |    |         |          |             |      |
| Sodium-22                                | U         | -0.0045  | 0.0737       | +/-0.0229  | 0.080 | pCi/g |    |         |          |             |      |
| Strontium-85                             | UI        | 0.122    | R,R5a 0.0755 | +/-0.0237  |       | pCi/g |    |         |          |             |      |
| Thallium-208                             |           | 0.810    | 0.0577       | +/-0.0551  | 0.080 | pCi/g |    |         |          |             |      |

# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8463  
Sample ID: 247964005  
Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result   | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|----------|--------|-----------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |          |        |           |       |       |    |         |          |      |        |      |
| GAMMA SPEC "Dry Weight Corrected"        |           |          |        |           |       |       |    |         |          |      |        |      |
| Thorium-227                              | U         | -0.0775  | 0.434  | +/-0.128  |       | pCi/g |    |         |          |      |        |      |
| Thorium-231                              | U         | 0.528    | 1.10   | +/-0.363  |       | pCi/g |    |         |          |      |        |      |
| Thorium-234                              |           | 3.37     | 3.15   | +/-1.37   | 2.00  | pCi/g |    |         |          |      |        |      |
| Tin-113                                  | U         | -0.00493 | 0.0794 | +/-0.0238 | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-235                              | U         | -0.0144  | 0.353  | +/-0.109  | 0.500 | pCi/g |    |         |          |      |        |      |
| Yttrium-88                               | U         | 0.0119   | 0.0548 | +/-0.016  | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |          |        |           |       |       |    |         |          |      |        |      |
| H3 "As Received"                         |           |          |        |           |       |       |    |         |          |      |        |      |
| Tritium                                  | U         | -8.15    | 195    | +/-55.2   | 250   | pCi/L |    | KXK2    | 03/15/10 | 1217 | 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery % | Acceptable Limits |
|---------------------------|------------------------------|------------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 91.8       | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 88.9       | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 97.2       | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded

Wednesday, February 24, 2010

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 10-2026

LOS ALAMOS

REQUEST NUMBER: 10-2026

NATIONAL LABORATORY

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/26/2010

General Engineering Laboratories, Inc.,  
Charleston, SC.

TURNAROUND REQ'D: 30

2040 Savage Rd

Charleston, SC 29407

LAB REQUEST COMMENTS:

2479647

| SAMPLE ID    | CTNR | CTNR DESC | ORDER                   | PRESERV | MATRIX |
|--------------|------|-----------|-------------------------|---------|--------|
| RE36-10-8489 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8489 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8486 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8486 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8487 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8487 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8462 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8462 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8463 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8463 | 1    | POLY      | H3                      | Ice     | R      |

Relinquished By:

Date

Time

Received By:

Date

Time

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Received for DISPOSAL By:

Date

Time

Remarks:

Printed Name

Signature

Wednesday, February 24, 2010

**LOS ALAMOS  
NATIONAL LABORATORY**

ATTN: Valerie Davis  
General Engineering Laboratories, Inc., Charleston, SC.  
2040 Savage Rd  
Charleston, SC 29407

These Samples are on:  
LANL Request Number: 10-2026  
Per Agreement Number: 126310011  
Project Cost Code: MR3A05529E00

Please analyse the enclosed samples  
according to the schedule indicated:

SHIP DATE: 2/24/2010  
TURNAROUND/REPORT DUE: 3/26/2010  
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Yes, Below Background

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature: 

| PRIORITY  | METHOD CODE | CNTNR | SAMPLE ID    | SAMPLE MATRIX | DATE SAMPLED | SPECIAL INSTRUCTIONS |
|-----------|-------------|-------|--------------|---------------|--------------|----------------------|
| EPA:901.1 |             | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|           |             | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|           |             | 1     | RE36-10-8466 | R             | 2/19/2010    |                      |
|           |             | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|           |             | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
| EPA:906.0 |             | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|           |             | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|           |             | 1     | RE36-10-8466 | R             | 2/19/2010    |                      |
|           |             | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |

Wednesday, February 24, 2010

| PRIORITY | METHOD CODE     | CNTNR | SAMPLE ID    | SAMPLE MATRIX | DATE SAMPLED | SPECIAL INSTRUCTIONS |
|----------|-----------------|-------|--------------|---------------|--------------|----------------------|
|          | EPA:908.0       | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:AM-241 | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8466 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:ISOPU  | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8466 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:ISOU   | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8466 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |

Final Page of REQUEST NUMBER 10-2026



March 04, 2010

[www.gel.com](http://www.gel.com)

Ms. Joylene Valdez  
Los Alamos National Laboratory  
PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm111  
Los Alamos, New Mexico 87545

Re: LANL ER Project  
Work Order: 247964  
SDG: 10-2026

Dear Ms. Valdez:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the following analytical results for the sample(s) we received on February 25, 2010, and analyzed for Radiochemistry. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4485.

Sincerely,

Valerie Davis  
Project Manager

Purchase Order: 72733-001-09  
Chain of Custody: 10-2026  
Enclosures

**Los Alamos National Laboratory (72733-001-09)**  
**LANL ER Project**  
**Work Order #: 247964**  
**SDG: 10-2026**



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# Case Narrative

Case Narrative for  
Los Alamos National Laboratory (72733-001-09)  
LANL ER Project  
Workorder #: 247964  
SDG # : 10-2026

March 04, 2010

**Laboratory Identification:**

GEL Laboratories LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary**

**Sample receipt** The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on February 25, 2010 for analysis. The samples were prepared/analyzed within the required holding time. Shipping container temperatures were checked, documented, and within specifications. The samples were screened according to GEL Standard Operating Procedure. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. Containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. The containers for radiochemistry were received at 12-14C temperatures. Shipping container temperature was within specification (0 - 6C).

**Sample Identification** The laboratory received the following samples:

| <u>Laboratory ID</u> | <u>Client ID</u> |
|----------------------|------------------|
| 247964001            | RE36-10-8489     |
| 247964002            | RE36-10-8486     |
| 247964003            | RE36-10-8487     |
| 247964004            | RE36-10-8462     |
| 247964005            | RE36-10-8463     |

**Case Narrative**

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package** The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry.

I certify that this data report is in compliance with the terms and conditions of the subcontract and task order, both technically and for completeness, for other than the conditions detailed in the attached case narrative.

  
Valerie Davis

Project Manager

**List of current GEL Certifications as of 04 March 2010**

| <b>State</b>              | <b>Certification</b> |
|---------------------------|----------------------|
| Arizona                   | AZ0668               |
| Arkansas                  | 88-0651              |
| CLIA                      | 42D0904046           |
| California – NELAP        | 01151CA              |
| Colorado                  | GEL                  |
| Connecticut               | PH-0169              |
| Dept. of Navy             | NFESC 413            |
| EPA Region 5              | WG-15J               |
| Florida – NELAP           | E87156               |
| Georgia                   | E87156 (FL/NELAP)    |
| Georgia DW                | 967                  |
| Hawaii                    | N/A                  |
| ISO 17025                 | 2567.01              |
| Idaho                     | SC00012              |
| Illinois – NELAP          | 200029               |
| Indiana                   | C-SC-01              |
| Kansas – NELAP            | E-10332              |
| Kentucky                  | 90129                |
| Louisiana – NELAP         | 03046                |
| Maryland                  | 270                  |
| Massachusetts             | M-SC012              |
| Nevada                    | SC00012              |
| New Jersey – NELAP        | SC002                |
| New Mexico                | FL NELAP E87156      |
| New York – NELAP          | 11501                |
| North Carolina            | 233                  |
| North Carolina DW         | 45709                |
| Oklahoma                  | 9904                 |
| Pennsylvania – NELAP      | 68-00485             |
| South Carolina            | 10120001/10120002    |
| Tennessee                 | TN 02934             |
| Texas – NELAP             | T104704235-07B-TX    |
| U.S. Dept. of Agriculture | S-52597              |
| Utah – NELAP              | GEL                  |
| Vermont                   | VT87156              |
| Virginia                  | 00151                |
| Washington                | C1641                |

# **Chain of Custody and Supporting Documentation**

Wednesday, February 24, 2010

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 10-2026

LOS ALAMOS

REQUEST NUMBER: 10-2026

NATIONAL LABORATORY

ATTN: Valerie Davis

TURNAROUND/REPORT DUE: 3/26/2010

General Engineering Laboratories, Inc.,  
Charleston, SC.

TURNAROUND REQ'D: 30

2040 Savage Rd

Charleston, SC 29407

LAB REQUEST COMMENTS:

2479647.

| SAMPLE ID    | CTNR | CTNR DESC | ORDER                   | PRESERV | MATRIX |
|--------------|------|-----------|-------------------------|---------|--------|
| RE36-10-8489 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8489 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8486 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8486 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8487 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8487 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8462 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8462 | 1    | POLY      | H3                      | Ice     | R      |
| RE36-10-8463 | 1    | POLY      | AM241+GS+ISOPU+ISO<br>U | None    | R      |
| RE36-10-8463 | 1    | POLY      | H3                      | Ice     | R      |

Relinquished By:

Date Time

Received By:

Date Time

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Printed Name

Signature

Received for DISPOSAL By:

Date Time

Remarks:

Printed Name

Signature

Wednesday, February 24, 2010

## LOS ALAMOS

NATIONAL LABORATORY

ATTN: Valerie Davis

General Engineering Laboratories, Inc., Charleston, SC.

2040 Savage Rd

Charleston, SC 29407

Please analyse the enclosed samples  
according to the schedule indicated:

SHIP DATE: 2/24/2010

TURNAROUND/REPORT DUE: 3/26/2010

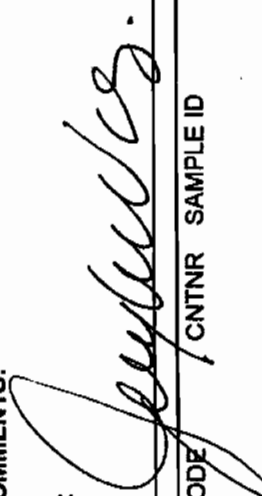
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Yes, Below Background

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:



Page 1 of 2

REQUEST NUMBER: 10-2026

These Samples are on:

LANL Request Number: 10-2026

Per Agreement Number: 126310011

Project Cost Code: MR3A05529E00

| PRIORITY | METHOD CODE | CNTNR | SAMPLE ID    | SAMPLE MATRIX | DATE SAMPLED | SPECIAL INSTRUCTIONS |
|----------|-------------|-------|--------------|---------------|--------------|----------------------|
|          | EPA:901.1   | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |             | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          | EPA:906.0   |       |              |               |              |                      |

Wednesday, February 24, 2010

REQUEST NUMBER: 10-2026

| PRIORITY | METHOD CODE     | CNTNR | SAMPLE ID    | SAMPLE MATRIX | DATE SAMPLED | SPECIAL INSTRUCTIONS |
|----------|-----------------|-------|--------------|---------------|--------------|----------------------|
|          | EPA:906.0       | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:AM-241 | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:ISOPU  | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |
|          | HASL-300:ISOU   | 1     | RE36-10-8462 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8463 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8486 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8487 | R             | 2/19/2010    |                      |
|          |                 | 1     | RE36-10-8489 | R             | 2/19/2010    |                      |

Final Page of REQUEST NUMBER 10-2026





Laboratories LLC

## SAMPLE RECEIPT &amp; REVIEW FORM

|                                     |  |     |                               |   |  |
|-------------------------------------|--|-----|-------------------------------|---|--|
| Client: LANL                        |  |     | SDG/ARCOC/Work Order: 10-2026 |   |  |
| Received By: Greg Tyler             |  |     | Date Received: 2/25/10        |   |  |
| Suspected Hazard Information        |  | Yes | No                            | *If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation. |  |
| COC/Samples marked as radioactive?  |  |     | X                             | Maximum Counts Observed*: 80cpm   |  |
| Classified Radioactive II by RSO?   |  |     | X                             |   |  |
| COC/Samples marked containing PCBs? |  |     | X                             |   |  |
| Shipped as a DOT Hazardous?         |  |     | X                             | Hazard Class Shipped: UN#:  |  |
| Samples identified as Foreign Soil? |  |     | X                             |   |  |

| Sample Receipt Criteria |  | Yes | NA | No | Comments/Qualifiers (Required for Non-Conforming Items)  |
|-------------------------|--|-----|----|----|--|
| 1                       | Shipping containers received intact and sealed?                | X   |    |    | Circle Applicable:<br>seals broken    damaged container    leaking container    other (describe) |
| 2                       | Samples requiring cold preservation within 0 ≤ 6 deg. C?       | X   |    |    | Preservation Method:<br>ice bags    blue ice    dry ice    none    other<br>0-6C    12-14C       |
| 3                       | Chain of custody documents included with shipment?             | X   |    |    |  |
| 4                       | Sample containers intact and sealed?                           | X   |    |    | Circle Applicable:<br>seals broken    damaged container    leaking container    other (describe) |
| 5                       | Samples requiring chemical preservation at proper pH?          |     | X  |    | Sample ID's, containers affected and observed pH:  |
| 6                       | VOA vials free of headspace (defined as < 6mm bubble)?         |     | X  |    | Sample ID's and containers affected:   |
| 7                       | Are Encore containers present?                                 |     |    | X  | (If yes, immediately deliver to Volatiles laboratory)  |
| 8                       | Samples received within holding time?                          | X   |    |    | Id's and tests affected:   |
| 9                       | Sample ID's on COC match ID's on bottles?                      | X   |    |    | Sample ID's and containers affected:   |
| 10                      | Date & time on COC match date & time on bottles?               |     | X  |    | Sample ID's affected:<br><b>No time on Chain of Custody.</b>                                     |
| 11                      | Number of containers received match number indicated on COC?   | X   |    |    | Sample ID's affected:  |
| 12                      | COC form is properly signed in relinquished/received sections? | X   |    |    |  |

Comments:

Fed Ex Tracking Numbers:

|                   |                   |                   |                    |                    |
|-------------------|-------------------|-------------------|--------------------|--------------------|
| 7209 7850 1919 0C | 7209 7850 1882 2C | 7209 7850 1941 3C | 7209 7850 2010 5C  | 7209 7850 2098 13C |
| 7209 7850 2146 1C | 7209 7850 2076 2C | 7209 7850 2043 3C | 7209 7850 2157 6C  | 7209 7850 1908 14C |
| 7209 7850 1952 1C | 7209 7850 2065 2C | 7209 7850 2238 3C | 7209 7850 1871 12C |                    |
| 7209 7850 2054 1C | 7209 7850 1996 3C | 7209 7850 2124 3C | 7209 7850 1893 12C |                    |
| 7209 7850 1963 1C | 7209 7850 2135 3C | 7209 7850 1974 4C | 7209 7850 1849 12C |                    |
| 7209 7850 2021 2C | 7209 7850 2032 3C | 7209 7850 1985 4C | 7209 7850 1838 13C |                    |
| 7209 7850 2113 2C | 7209 7850 2249 3C | 7209 7850 2000 4C | 7209 7850 1860 13C |                    |
| 7209 7850 2102 2C | 7209 7850 2168 3C | 7209 7850 2087 4C | 7209 7850 1850 13C |                    |

LOS ALAMOS NATL LAB  
TAGO BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 49.0 LB 11  
CAD: 0014176/CAFE

BILL SENDER

VALERIE DAVIS  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TAGO BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 24FEB10  
ACTWGT: 63.0 LB 11  
CAD: 0014176/CAFE2460

BILL SENDER

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 6B010AMR3A0532VA00

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 6B010AMR1A015AGWMO

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2 of 2

7209 7850 1919

7209 7850 1908 (0201)

THU - 25FEB  
PRIORITY OVERNIGHT

29

X CHSA

2 of 2

7209 7850 2146

7209 7850 2135 (0201)

THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA

VALERIE DAVIS  
GENERAL ENGINEERING LAB  
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GENERAL ENGINEERING LAB  
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(843) 556-8171  
REF: 6B010AMR1A015AGWMO

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Express



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THU - 25FEB A1  
PRIORITY OVERNIGHT

THU - 25FEB A1  
PRIORITY OVERNIGHT

7209 7850 1952

7209 7850 1941 (0201)

X CHSA

29407  
SC-US  
CHS

7209 7850 2054

MASTER NM

XX CHSA

29407  
SC-US  
CHS

JANE VALDEZ  
ALAMOS NATL LAB  
3 BLDG 1237 DPU 03

ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 49.8 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

LERIE DAVIS  
GENERAL ENGINEERING LAB  
40 SAVAGE RD

CHARLESTON SC 29407

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REF: 6B010AMR3A05529E00

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Express



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JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
1A00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 49.8 LB MAN  
CAD: 0014176/CAFE2450

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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

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REF: 6B010AMR2A0515BYDO

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3 of 3 THU - 25FEB A1  
7209 7850 1963  
7209 7850 1941 0201

CHSA

29407  
SC-US  
CHS



ALAMOS, NM 87545  
UNITED STATES US

BILL SENDER

LERIE DAVIS  
GENERAL ENGINEERING LAB  
40 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171  
REF: 6B010AMR1A015AGNMO

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Express

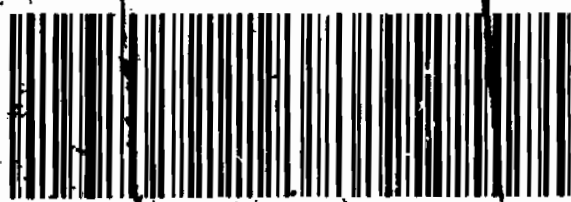


0014176/CAFE2450

TRKH 7209 7850 2021  
0201

XX CHSA

29407  
SC-US  
CHS



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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

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REF: 6B010AMR1A015AGNMO

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Express



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1 of 2 THU - 25FEB A1  
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MASTER WH

X CHSA

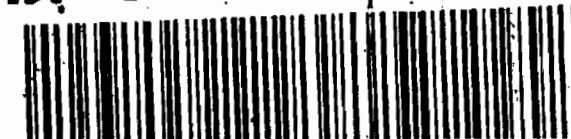
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SC-US  
CHS



2 of 2  
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0201  
Master 7209 7850 2098 0201

XX CHSA

29407  
SC-US  
CHS



ORIGIN ID: SAFA (505) 666-9968  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 24 FEB 10  
ACTWGT: 55.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

CAD: 0014176/CAFE2450

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

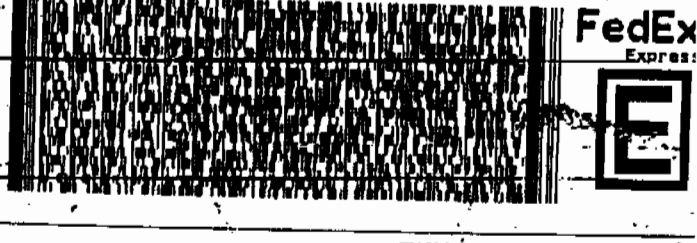
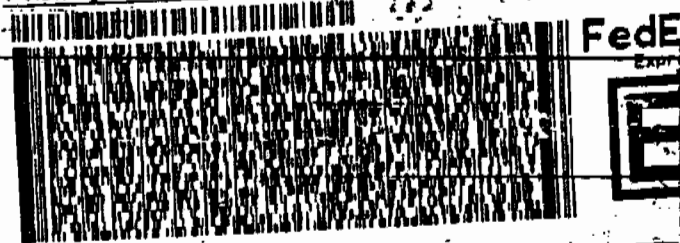
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TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 6B010AMR1A015AGWMO



2 of 3  
NPS# 7209 7850 1882  
Matr# 7209 7850 1871 0201

THU - 25FEB  
PRIORITY OVERNIGHT

1 of 2  
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NN MASTER NN

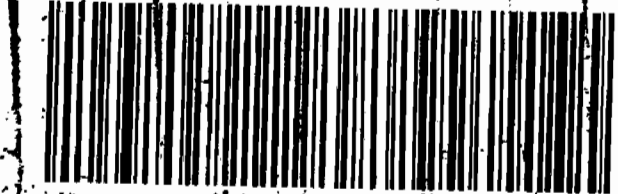
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PRIORITY OVERNIGHT

XX CHSA

294

XX CHSA

29407  
SC-US  
CHS



LOS ALAMOS, NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

CAD: 0014176/CAFE2450

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LOS ALAMOS, NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 24FEB10  
ACTWGT: 49.0 LB MAN  
CAD: 0014176/CAFE2450

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TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

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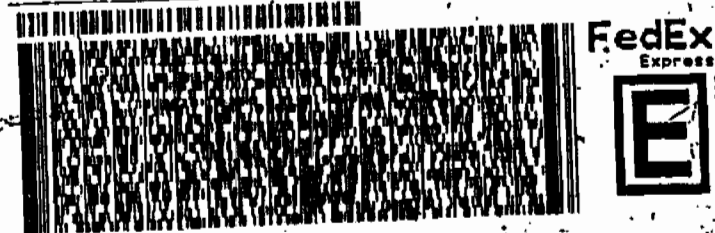
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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

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REF: 6B010AMR2A0515BYDO



2 of 2  
NPS# 7209 7850 2065  
Matr# 7209 7850 2054 0201

THU - 25FEB A1  
PRIORITY OVERNIGHT

2 of 2  
7209 7850 1996  
7209 7850 1985 0201

THU - 25FEB A1  
PRIORITY OVERNIGHT

XX CHSA

29407  
SC-US  
CHS

XX CHSA

29407  
SC-US  
CHS



JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

ACTING: 50.0 LB MAN  
CAD: 0014175/CAFE2450  
BILL SENDER

JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

ACTING: 51.0 LB MAN  
CAD: 0014175/CAFE2450  
BILL SENDER

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2040 SAVAGE RD

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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

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REF: 6B010AMR3A0223KY10



1 of 2  
TRKH 7209 7850 2135  
0201  
NN MASTER NN

THU - 25FEB  
PRIORITY OVERNIGHT

1 of 2  
TRKH 7209 7850 2032  
0201  
NN MASTER NN

THU - 25FEB A1  
PRIORITY OVERNIGHT

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29407  
SC-US  
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JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

ACTING: 50.0 LB MAN  
CAD: 0014175/CAFE2450  
BILL SENDER

JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

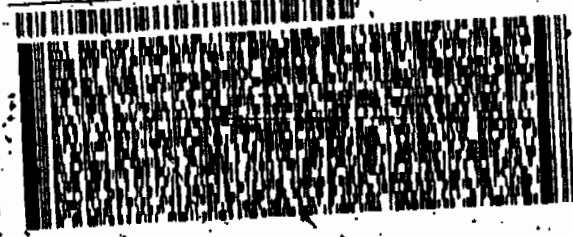
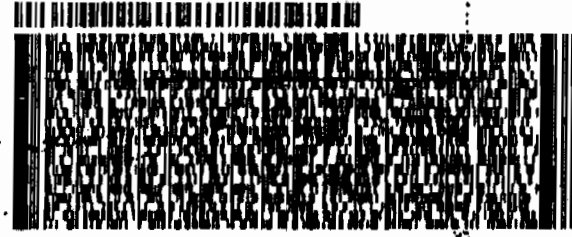
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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

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REF: 6B010AMR1A015AGWMO

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(843) 556-8171  
REF: 6B010AREW0140T500



2 of 2  
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PRIORITY OVERNIGHT

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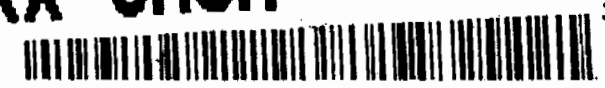
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PRIORITY OVERNIGHT

XX CHSA

29407  
SC-US  
CHS

XX CHSA

29407  
SC-US  
CHS





LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 52.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 52.0 LB MAN  
CAD: 0014176/CAFE2450

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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 6B010AMR3A05529E00

3c

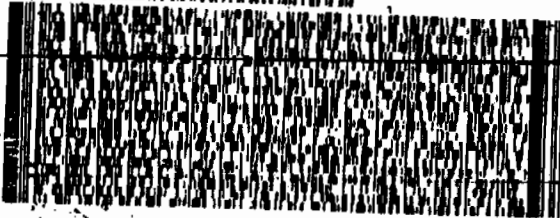
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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 6B010AMR3A0223KY10

3c



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1 of 3  
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THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA

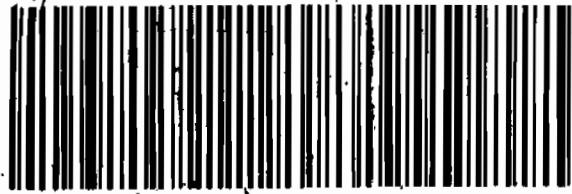


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THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA



ORIGIN ID: SAFA (505) 665-9968  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 52.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

ORIGIN ID: SAFA (505) 665-9968  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 24FEB10  
ACTWGT: 57.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 6B010AMR1A015AGWMO

3

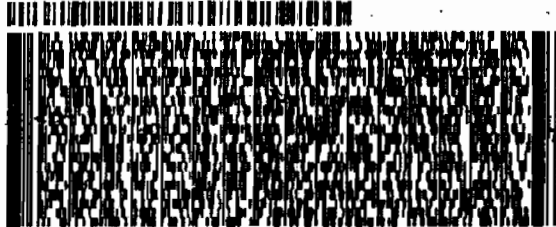
TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 6B010AMR1A015AGWMO

3c



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1 of 2  
TRKH 0201 7209 7850 2238  
NM MASTER NM

THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
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Page 1 of 1

2 of 2  
NPSH 0263 7209 7850 2124  
Mstr# 7209 7850 2113 0201

THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

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Page 1 of 1

JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT  
CAD: 01

45.0 LB MAN  
314176/CAFE2450

BILL SENDER

OER

LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

CAD: 0014176/CAFE2450

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 6B010AMR3A05529E00

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 6B010AMR2A0515BYDO

1 of 2

THU - 25FEB A1

PRIORITY OVERNIGHT

29407

SC-US

CHS

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TRKH 7209 7850 1974

0201

LOS ALAMOS, NM 87545

UNITED STATES US

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VALERIE DAVIS

GENERAL ENGINEERING LAB

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CHARLESTON SC 29407

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1 of 2

THU - 25FEB A1

PRIORITY OVERNIGHT

29407

SC-US

CHS

XX CHSA

TRKH 7209 7850 1985

0201

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UNITED STATES US

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GENERAL ENGINEERING LAB

2040 SAVAGE RD

CHARLESTON SC 29407

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REF: 6B010AMR2A0515BYDO

2 of 2

THU - 25FEB A1

PRIORITY OVERNIGHT

29407

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CHS

XX CHSA

TRKH 7209 7850 2000

0201

LOS ALAMOS, NM 87545

UNITED STATES US

BILL SENDER

VALERIE DAVIS

GENERAL ENGINEERING LAB

TRKH 7209 7850 1985

0201

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UNITED STATES US

BILL SENDER

VALERIE DAVIS

GENERAL ENGINEERING LAB

2040 SAVAGE RD

CHARLESTON SC 29407

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REF: 6B010AMR1A015AGWMO

2 of 2

THU - 25FEB A1

PRIORITY OVERNIGHT

29407

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CHS

XX CHSA

TRKH 7209 7850 2087

0201

LOS ALAMOS, NM 87545

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VALERIE DAVIS

GENERAL ENGINEERING LAB

2040 SAVAGE RD

CHARLESTON SC 29407

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REF: 6B010AMR1A015AGWMO

2 of 2

THU - 25FEB A1

PRIORITY OVERNIGHT

29407

SC-US

CHS

XX CHSA

TRKH 7209 7850 2076

0201

LOS ALAMOS, NM 87545

UNITED STATES US

BILL SENDER

VALERIE DAVIS

GENERAL ENGINEERING LAB

JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 62.0 LB HHN  
CAD: 0014176/CAFE245

BILL SENDER

ORIGIN-ID: SAFA (500) 000-9900  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

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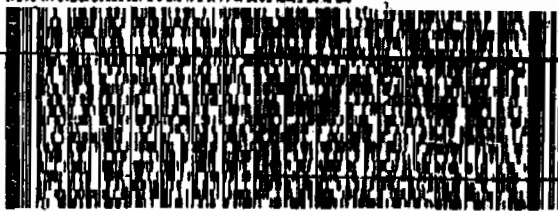
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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407  
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GENERAL ENGINEERING LAB  
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CHARLESTON SC 29407  
(843) 556-8171  
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FedEx



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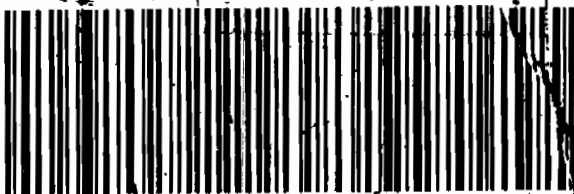


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2 of 2  
MPSH 7209 7850 2010  
Matr# 7209 7850 2000 [0201]

THU - 25FEB  
PRIORITY OVERNIGHT

XX CHSA



OR  
JOY  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

CAD: 0014176/CAFE2450

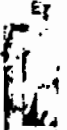
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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407  
(843) 556-8171  
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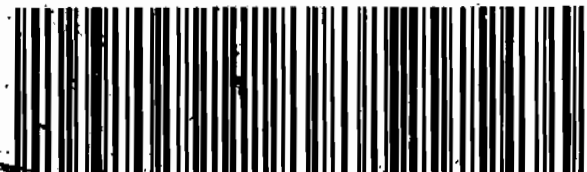
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TRKH 7209 7850 2157  
[0201]

THU - 25FEB A1  
PRIORITY OVERNIGHT

XX CHSA



JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

CAD: 0014176/CAFE2450

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407  
(843) 556-8171  
REF: 6B010AMR3A0532VA00



FedEx



JAN090911M0223

1 of 3  
TRKH 7209 7850 1871  
[0201]  
NM MASTER NM

THU - 25FEB  
PRIORITY OVERNIGHT

XX CHSA



294



3 of 3  
MPSH 7209 7850 1893  
Matr# 7209 7850 1871 [0201]

THU - 25FEB A1  
PRIORITY OVERNIGHT

XX CHSA



29407  
SC-US  
CHS



ORIGIN ID: SAFA (DWO) 000-9999  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 56.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

ACTWGT: 56.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

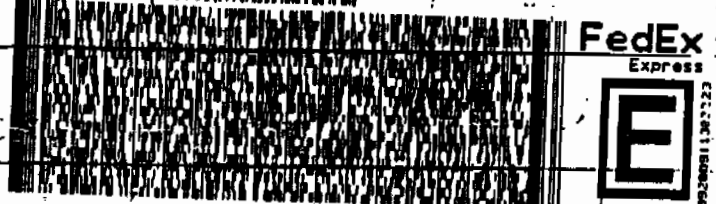
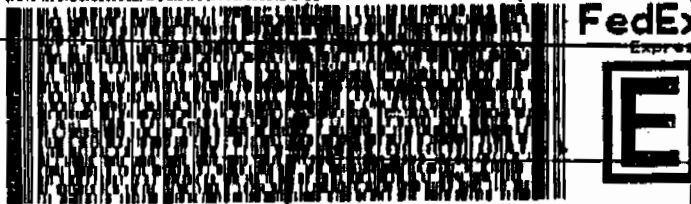
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GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

REF: 6B010AMR3A0532VA00



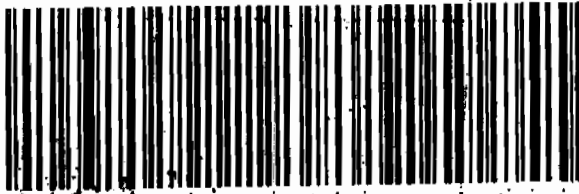
3 of 3  
MPS# 7209 7850 1849  
0263

Master 7209 7850 1827 0201

THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA



2 of 3  
MPS# 7209 7850 1838  
0263

Master 7209 7850 1827 0201

THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA



ORIGIN ID: SAFA (505) 000-9999  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 24FEB10  
ACTWGT: 56.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

ORIGIN ID: SAFA (505) 000-9999  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TA00 BLDG 1237 DPU 03  
LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 24FEB10  
ACTWGT: 56.0 LB MAN  
CAD: 0014176/CAFE2450

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 556-8171

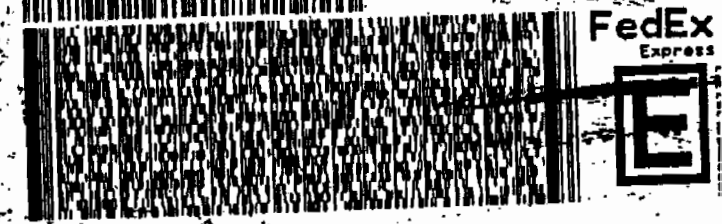
REF: 6B010AMR3A0532VA00

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REF: 6B010AMR3A0532VA00



2 of 2  
MPS# 7209 7850 1860  
0263

Master 7209 7850 1850 0201

THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA

1 of 2  
MPS# 7209 7850 1850  
0201

Master 7209 7850 1850 0201

THU - 25FEB A1  
PRIORITY OVERNIGHT

29407  
SC-US  
CHS

XX CHSA

ORIGIN ID: SAFA (505) 665-9968  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TAGO BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 24FEB10  
ACTWT: 66.8 LB-MAN  
CAD: 0014176/CAFE2450

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 6B010AMR1A015AGWMO

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Express



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1 of 2

TRKH  
0201 7209 7850 2098

MM MASTER MM

THU - 25FEB A1  
PRIORITY OVERNIGHT

XX CHSA

29407  
SC-US  
CHS



ORIGIN ID: SAFA (505) 665-9968  
JOYLENE VALDEZ  
LOS ALAMOS NATL LAB  
TAGO BLDG 1237 DPU 03

LOS ALAMOS, NM 87545  
UNITED STATES US

SHIP DATE: 24FEB10  
ACTWT: 62.8 LB-MAN  
CAD: 0014176/CAFE2450

BILL SENDER

TO VALERIE DAVIS  
GENERAL ENGINEERING LAB  
2040 SAVAGE RD

CHARLESTON SC 29407

(843) 666-8171

REF: 6B010AMR3A0532VA00

14C



FedEx  
Express



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1 of 2

TRKH  
0201 7209 7850 1908

MM MASTER MM

THU - 25FEB A1  
PRIORITY OVERNIGHT

XX CHSA

29407  
SC-US  
CHS

# **Data Review Qualifier Flag Definition Sheet**

## Data Review Qualifier Definitions

| Qualifier | Explanation |
|-----------|-------------|
|-----------|-------------|

|     |   |
|-----|---|
| *   | A quality control analyte recovery is outside of specified acceptance criteria  |
| **  | Analyte is a surrogate compound   |
| <   | Result is less than value reported  |
| >   | Result is greater than value reported   |
| ^   | RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL  |
| A   | The TIC is a suspected aldol-condensation product   |
| B   | Target analyte was detected in the associated blank   |
| B   | Metals-Either presence of analyte detected in the associated blank, or<br>MDL/IDL < sample value < PQL  |
| BD  | Results are either below the MDC or tracer recovery is low  |
| C   | Analyte has been confirmed by GC/MS analysis  |
| D   | Results are reported from a diluted aliquot of the sample   |
| d   | 5-day BOD-The 2:1 depletion requirement was not met for this sample   |
| E   | Organics-Concentration of the target analyte exceeds the instrument calibration range   |
| E   | Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria   |
| H   | Analytical holding time was exceeded  |
| h   | Preparation or preservation holding time was exceeded   |
| J   | Value is estimated  |
| N   | Metals-The Matrix spike sample recovery is not within specified control limits  |
| N   | Organics-Presumptive evidence based on mass spectral library search to make a tentative<br>identification of the analyte (TIC). Quantitation is based on nearest internal standard<br>response factor |
| N/A | Spike recovery limits do not apply. Sample concentration exceeds spike concentration<br>by 4X or more   |
| ND  | Analyte concentration is not detected above the reporting limit   |
| UI  | Gamma Spectroscopy-Uncertain identification   |
| X   | Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  |
| Y   | QC Samples were not spiked with this compound   |
| Z   | Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.  |

# RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative  
Los Alamos National Laboratory (LANL)  
SDG 10-2026**

**Method/Analysis Information**

**Product:** AM241  
**Analytical Method:** DOE EML HASL-300, Am-05-RC Modified  
**Prep Method:** Dry Soil Prep  
**Analytical Batch Number:** 962401  
**Prep Batch Number:** 958205

| <b>Sample ID</b> | <b>Client ID</b>                                |
|------------------|---|
| 247964001        | RE36-10-8489                                    |
| 247964002        | RE36-10-8486                                    |
| 247964003        | RE36-10-8487                                    |
| 247964004        | RE36-10-8462                                    |
| 247964005        | RE36-10-8463                                    |
| 1202064503       | Method Blank (MB)                               |
| 1202064504       | 247970001(RE46-10-13181) Sample Duplicate (DUP) |
| 1202064505       | Laboratory Control Sample (LCS)                 |

The samples in this SDG were analyzed on a "dry weight" basis.

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 18.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

Aliquot for sample 1202064503 (MB) was changed to 1.0 per client request.

**Designated QC**

The following sample was used for QC: 247970001 (RE46-10-13181). The QC was from LANL work order 247970.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

The MDCs are calculated using a blank population.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** ISOPU

**Analytical Method:** DOE EML HASL-300, Pu-11-RC Modified

**Prep Method:** Dry Soil Prep

**Analytical Batch Number:** 962402

**Prep Batch Number:** 958205

| Sample ID  | Client ID                                       |
|------------|---|
| 247964001  | RE36-10-8489                                    |
| 247964002  | RE36-10-8486                                    |
| 247964003  | RE36-10-8487                                    |
| 247964004  | RE36-10-8462                                    |
| 247964005  | RE36-10-8463                                    |
| 1202064506 | Method Blank (MB)                               |
| 1202064507 | 247970001(RE46-10-13181) Sample Duplicate (DUP) |
| 1202064508 | Laboratory Control Sample (LCS)                 |

The samples in this SDG were analyzed on a "dry weight" basis.

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 18.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

##### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

Aliquot for sample 1202064506 (MB) was changed to 1.0 per client request.

##### **Designated QC**

The following sample was used for QC: 247970001 (RE46-10-13181). The QC was from LANL work order 247970.



**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The Pu-238 blank result is greater than 1.65 times the CSU but less than the MDC.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**

Manual integration of alpha spectroscopy spectra 1202064508 (LCS) was performed to fully separate counts in Regions of Interest which would have been biased.

**Additional Comments**

The MDCs are calculated using a blank population.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

|                          |                                    |
|--------------------------|------------------------------------|
| <b>Product:</b>          | ISOU                               |
| Analytical Method:       | DOE EML HASL-300, U-02-RC Modified |
| Prep Method:             | Dry Soil Prep                      |
| Analytical Batch Number: | 962404                             |
| Prep Batch Number:       | 958205                             |

| <b>Sample ID</b> | <b>Client ID</b>                                |
|------------------|---|
| 247964001        | RE36-10-8489                                    |
| 247964002        | RE36-10-8486                                    |
| 247964003        | RE36-10-8487                                    |
| 247964004        | RE36-10-8462                                    |
| 247964005        | RE36-10-8463                                    |
| 1202064509       | Method Blank (MB)                               |
| 1202064510       | 247970001(RE46-10-13181) Sample Duplicate (DUP) |
| 1202064511       | Laboratory Control Sample (LCS)                 |

The samples in this SDG were analyzed on a "dry weight" basis.

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 18.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met. Calibrations are performed monthly using mixed alpha standards comprised of the following: Gd-148, Np-237, and Cm-244.

##### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

Aliquot for sample 1202064509 (MB) was changed to 1.0 per client request.

##### **Designated QC**

The following sample was used for QC: 247970001 (RE46-10-13181). The QC was from LANL work order 247970.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **CSU**

The U-233/234 and U-238 blank results are greater than 1.65 times the CSU but less than the MDC.

#### **Technical Information:**

##### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

The MDCs are calculated using a blank population.

**Blank Decision Level**

The U-238 blank result is greater than the decision level but less than the MDC.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

|                          |                               |
|--------------------------|-------------------------------|
| <b>Product:</b>          | <b>GAMMA SPEC</b>             |
| Analytical Method:       | DOE HASL 300, 4.5.2.3/Ga-01-R |
| Prep Method:             | Dry Soil Prep                 |
| Analytical Batch Number: | 958216                        |
| Prep Batch Number:       | 958205                        |

| <b>Sample ID</b> | <b>Client ID</b>                                |
|------------------|---|
| 247964001        | RE36-10-8489                                    |
| 247964002        | RE36-10-8486                                    |
| 247964003        | RE36-10-8487                                    |
| 247964004        | RE36-10-8462                                    |
| 247964005        | RE36-10-8463                                    |
| 1202054948       | Method Blank (MB)                               |
| 1202054949       | 247970001(RE46-10-13181) Sample Duplicate (DUP) |
| 1202054950       | Laboratory Control Sample (LCS)                 |

The samples in this SDG were analyzed on a "dry weight" basis.

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 19.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibrations were performed in April 2009, June 2009, July 2009, August 2009, October 2009, November 2009 and February 2010.

**Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:****Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 247970001 (RE46-10-13181). The QC was from LANL work order 247970.

**QC Information**

All of the QC samples met the required acceptance limits.

**CSU**

The blank result is less than 1.65 times the CSU.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:****Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

**Additional Comments**

Additional comments were not required for this sample set.

**Blank Decision Level**

The blank result is less than the decision level.

**Qualifier information**

| Qualifier | Reason                              | Analyte       | Sample     | Client Sample               |
|-----------|-------------------------------------|---------------|------------|-----------------------------|
| UI        | Data rejected due to interference.  | Bismuth-211   | 247964001  | RE36-10-8489                |
|           |                                     |               | 247964002  | RE36-10-8486                |
|           |                                     |               | 247964003  | RE36-10-8487                |
|           |                                     |               | 247964004  | RE36-10-8462                |
|           |                                     |               | 247964005  | RE36-10-8463                |
|           |                                     | Cadmium-109   | 1202054949 | RE46-10-13181(247970001DUP) |
|           |                                     |               | 247964001  | RE36-10-8489                |
|           |                                     |               | 247964002  | RE36-10-8486                |
|           |                                     |               | 247964003  | RE36-10-8487                |
|           |                                     |               | 247964004  | RE36-10-8462                |
|           |                                     | Mercury-203   | 247964005  | RE36-10-8463                |
|           |                                     |               | 1202054949 | RE46-10-13181(247970001DUP) |
|           |                                     |               | 247964001  | RE36-10-8489                |
|           |                                     | Radium-224    | 247964001  | RE36-10-8489                |
|           |                                     |               | 247964002  | RE36-10-8486                |
|           |                                     |               | 247964003  | RE36-10-8487                |
|           |                                     |               | 247964004  | RE36-10-8462                |
|           |                                     |               | 247964005  | RE36-10-8463                |
|           |                                     |               | 1202054949 | RE46-10-13181(247970001DUP) |
| UI        | Data rejected due to low abundance. | Americium-241 | 247964003  | RE36-10-8487                |
|           |                                     | Cesium-134    | 247964002  | RE36-10-8486                |
|           |                                     |               | 247964003  | RE36-10-8487                |

|    |                                     |              |           |              |
|----|-------------------------------------|--------------|-----------|--------------|
|    |                                     |              | 247964004 | RE36-10-8462 |
|    |                                     |              | 247964005 | RE36-10-8463 |
|    |                                     | Mercury-203  | 247964005 | RE36-10-8463 |
|    |                                     | Strontium-85 | 247964003 | RE36-10-8487 |
|    |                                     |              | 247964004 | RE36-10-8462 |
|    |                                     |              | 247964005 | RE36-10-8463 |
| UI | Data rejected due to no valid peak. | Uranium-235  | 247964001 | RE36-10-8489 |

### **Method/Analysis Information**

**Product:** H3  
**Analytical Method:** GL-RAD-A-002  
**Analytical Batch Number:** 964049

| Sample ID  | Client ID                                      |
|------------|--|
| 247964001  | RE36-10-8489                                   |
| 247964002  | RE36-10-8486                                   |
| 247964003  | RE36-10-8487                                   |
| 247964004  | RE36-10-8462                                   |
| 247964005  | RE36-10-8463                                   |
| 1202068192 | Method Blank (MB)                              |
| 1202068193 | 248028005(RE15-10-8391) Sample Duplicate (DUP) |
| 1202068194 | Laboratory Control Sample (LCS)                |

The samples in this SDG were analyzed on an "as received" basis.

### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 18.

### **Calibration Information:**

#### **Calibration Information**

All initial and continuing calibration requirements have been met. The initial Calibrations were

performed in July 2009 and August 2009.

#### **Standards Information**

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

#### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Designated QC**

The following sample was used for QC: 248028005 (RE15-10-8391). The QC was from LANL work order 248028.

##### **QC Information**

All of the QC samples met the required acceptance limits.

##### **CSU**

The blank result is less than 1.65 times the CSU.

#### **Technical Information:**

##### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

##### **Sample Re-prep/Re-analysis**

Samples 247964004 (RE36-10-8462) and 247964005 (RE36-10-8463) were recounted due to high MDAs. Sample 1202068192 (MB) was recounted due to the quench number being outside the calibration range. Recount is being reported. Sample 247964002 (RE36-10-8486) was recounted to verify sample activity. Second count being reported.

#### **Miscellaneous Information:**

##### **Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

##### **Additional Comments**

Additional comments were not required for this sample set.

##### **Blank Decision Level**

The blank result is less than the decision level.

#### **Qualifier information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

**Reviewer/Date:**\_\_\_\_\_

 3/23/10



# SAMPLE DATA SUMMARY

## GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

### Certificate of Analysis Report for

LANL010 Los Alamos National Laboratory (72733-001-09)

Client SDG: 10-2026 GEL Work Order: 247964

**The Qualifiers in this report are defined as follows:**

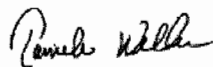
- \* Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
- \*\* Indicates the analyte is a surrogate compound.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis.

Reviewed by



# GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

## Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8489  
Sample ID: 247964001  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 4.81%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result   | DL     | TPU        | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|----------|--------|------------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |          |        |            |       |       |    |         |          |      |        |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |          |        |            |       |       |    |         |          |      |        |      |
| Americium-241                            | U         | 0.0014   | 0.0207 | +/-0.00211 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 1114 | 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |          |        |            |       |       |    |         |          |      |        |      |
| Plutonium-238                            | U         | 0.00291  | 0.0197 | +/-0.00484 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 2224 | 962402 | 2    |
| Plutonium-239/240                        | U         | 0.000178 | 0.0166 | +/-0.00334 | 0.050 | pCi/g |    |         |          |      |        |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |          |        |            |       |       |    |         |          |      |        |      |
| Uranium-233/234                          |           | 1.47     | 0.112  | +/-0.131   | 0.100 | pCi/g |    | JXH2    | 03/22/10 | 2119 | 962404 | 3    |
| Uranium-235/236                          | U         | 0.0489   | 0.0682 | +/-0.0159  | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-238                              |           | 1.40     | 0.0785 | +/-0.126   | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Gamma Spec Analysis</b>           |           |          |        |            |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |          |        |            |       |       |    |         |          |      |        |      |
| Americium-241                            | U         | 0.0447   | 0.266  | +/-0.0792  | 0.200 | pCi/g |    | MXR1    | 03/10/10 | 2117 | 958216 | 4    |
| Bismuth-211                              | UI        | 6.26     | 0.333  | +/-0.417   |       | pCi/g |    |         |          |      |        |      |
| Bismuth-214                              |           | 1.91     | 0.110  | +/-0.135   | 0.200 | pCi/g |    |         |          |      |        |      |
| Cadmium-109                              | UI        | 5.44     | 1.24   | +/-0.646   |       | pCi/g |    |         |          |      |        |      |
| Cerium-139                               | U         | -0.0167  | 0.0499 | +/-0.0148  | 0.050 | pCi/g |    |         |          |      |        |      |
| Cesium-134                               | U         | 0.102    | 0.103  | +/-0.0328  | 0.100 | pCi/g |    |         |          |      |        |      |
| Cesium-137                               | U         | -0.0305  | 0.0576 | +/-0.0188  | 0.100 | pCi/g |    |         |          |      |        |      |
| Cobalt-60                                | U         | 0.0402   | 0.0679 | +/-0.0187  | 0.100 | pCi/g |    |         |          |      |        |      |
| Europium-152                             | U         | -0.0538  | 0.154  | +/-0.0471  | 0.200 | pCi/g |    |         |          |      |        |      |
| Lanthanum-140                            | U         | 0.033    | 0.168  | +/-0.055   |       | pCi/g |    |         |          |      |        |      |
| Lead-212                                 |           | 2.58     | 0.0963 | +/-0.166   | 0.100 | pCi/g |    |         |          |      |        |      |
| Lead-214                                 |           | 2.27     | 0.122  | +/-0.164   | 0.100 | pCi/g |    |         |          |      |        |      |
| Mercury-203                              | UI        | 0.0828   | 0.0669 | +/-0.0376  | 0.100 | pCi/g |    |         |          |      |        |      |
| Potassium-40                             |           | 37.6     | 0.574  | +/-1.91    | 1.00  | pCi/g |    |         |          |      |        |      |
| Radium-223                               | U         | 0.292    | 1.07   | +/-0.360   |       | pCi/g |    |         |          |      |        |      |
| Radium-224                               | UI        | 8.17     | 1.03   | +/-0.819   |       | pCi/g |    |         |          |      |        |      |
| Radium-226                               |           | 1.91     | 0.110  | +/-0.135   |       | pCi/g |    |         |          |      |        |      |
| Radium-228                               |           | 2.47     | 0.230  | +/-0.229   | 0.500 | pCi/g |    |         |          |      |        |      |
| Ruthenium-106                            | U         | -0.163   | 0.499  | +/-0.157   | 0.800 | pCi/g |    |         |          |      |        |      |
| Sodium-22                                | U         | -0.0211  | 0.071  | +/-0.0228  | 0.080 | pCi/g |    |         |          |      |        |      |
| Strontium-85                             | U         | 0.0237   | 0.0666 | +/-0.0215  |       | pCi/g |    |         |          |      |        |      |

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## Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8489  
Sample ID: 247964001

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|--------|-----------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |           |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |        |           |       |       |    |         |          |      |        |      |
| Thallium-208                             |           | 0.844   | 0.0601 | +/-0.062  | 0.080 | pCi/g |    |         |          |      |        |      |
| Thorium-227                              | U         | -0.107  | 0.423  | +/-0.130  |       | pCi/g |    |         |          |      |        |      |
| Thorium-231                              | U         | 0.292   | 1.07   | +/-0.360  |       | pCi/g |    |         |          |      |        |      |
| Thorium-234                              | U         | 1.40    | 2.45   | +/-0.721  | 2.00  | pCi/g |    |         |          |      |        |      |
| Tin-113                                  | U         | -0.0398 | 0.0736 | +/-0.0225 | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-235                              | UI        | 0.390   | 0.330  | +/-0.143  | 0.500 | pCi/g |    |         |          |      |        |      |
| Yttrium-88                               | U         | 0.028   | 0.0651 | +/-0.0176 | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |         |        |           |       |       |    |         |          |      |        |      |
| <i>H3 "As Received"</i>                  |           |         |        |           |       |       |    |         |          |      |        |      |
| Tritium                                  | U         | 137     | 181    | +/-56.6   | 250   | pCi/L |    | KXX2    | 03/19/10 | 1445 | 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery % | Acceptable Limits |
|---------------------------|------------------------------|------------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 90.9       | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 93.7       | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 86.3       | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8489 Project: LANL01004  
Sample ID: 247964001 Client ID: LANL010

| Parameter | Qualifier | Result | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|

H Analytical holding time was exceeded

J Value is estimated

M M if above MDC and less than LLD

M Matrix Related Failure

N/A RPD or %Recovery limits do not apply.

ND Analyte concentration is not detected above the detection limit

NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

R Sample results are rejected

U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

UI Gamma Spectroscopy--Uncertain identification

UJ Gamma Spectroscopy--Uncertain identification

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Y QC Samples were not spiked with this compound

^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.

h Preparation or preservation holding time was exceeded

The above sample is reported on a dry weight basis.

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8486  
Sample ID: 247964002  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 3.41%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result    | DL     | TPU        | RL    | Units | DF   | Analyst  | Date | Time   | Batch | Mtd. |
|--|-----------|-----------|--------|------------|-------|-------|------|----------|------|--------|-------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |           |        |            |       |       |      |          |      |        |       |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |           |        |            |       |       |      |          |      |        |       |      |
| Americium-241                            | U         | -0.00182  | 0.0216 | +/-0.00148 | 0.050 | pCi/g | JXH2 | 03/22/10 | 1114 | 962401 | 1     |      |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |           |        |            |       |       |      |          |      |        |       |      |
| Plutonium-238                            | U         | 0.0149    | 0.021  | +/-0.00979 | 0.050 | pCi/g | JXH2 | 03/22/10 | 2224 | 962402 | 2     |      |
| Plutonium-239/240                        | U         | -0.000506 | 0.0178 | +/-0.00422 | 0.050 | pCi/g |      |          |      |        |       |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |           |        |            |       |       |      |          |      |        |       |      |
| Uranium-233/234                          |           | 1.56      | 0.109  | +/-0.137   | 0.100 | pCi/g | JXH2 | 03/22/10 | 2119 | 962404 | 3     |      |
| Uranium-235/236                          |           | 0.0762    | 0.0664 | +/-0.0198  | 0.100 | pCi/g |      |          |      |        |       |      |
| Uranium-238                              |           | 1.41      | 0.0764 | +/-0.126   | 0.100 | pCi/g |      |          |      |        |       |      |
| <b>Rad Gamma Spec Analysis</b>           |           |           |        |            |       |       |      |          |      |        |       |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |           |        |            |       |       |      |          |      |        |       |      |
| Americium-241                            | U         | -0.0476   | 0.0858 | +/-0.0286  | 0.200 | pCi/g | MXR1 | 03/10/10 | 2117 | 958216 | 4     |      |
| Bismuth-211                              | UI        | 6.74      | 0.328  | +/-0.443   |       | pCi/g |      |          |      |        |       |      |
| Bismuth-214                              |           | 2.10      | 0.121  | +/-0.163   | 0.200 | pCi/g |      |          |      |        |       |      |
| Cadmium-109                              | UI        | 6.00      | 0.774  | +/-0.503   |       | pCi/g |      |          |      |        |       |      |
| Cerium-139                               | U         | -0.0221   | 0.0444 | +/-0.0134  | 0.050 | pCi/g |      |          |      |        |       |      |
| Cesium-134                               | UI        | 0.137     | 0.110  | +/-0.0395  | 0.100 | pCi/g |      |          |      |        |       |      |
| Cesium-137                               | U         | 0.0042    | 0.0858 | +/-0.0243  | 0.100 | pCi/g |      |          |      |        |       |      |
| Cobalt-60                                | U         | -0.0128   | 0.085  | +/-0.0264  | 0.100 | pCi/g |      |          |      |        |       |      |
| Europium-152                             | U         | 0.00603   | 0.165  | +/-0.0512  | 0.200 | pCi/g |      |          |      |        |       |      |
| Lanthanum-140                            | U         | -0.0855   | 0.160  | +/-0.0545  |       | pCi/g |      |          |      |        |       |      |
| Lead-212                                 |           | 2.60      | 0.0867 | +/-0.161   | 0.100 | pCi/g |      |          |      |        |       |      |
| Lead-214                                 |           | 2.45      | 0.119  | +/-0.174   | 0.100 | pCi/g |      |          |      |        |       |      |
| Mercury-203                              | U         | 0.00796   | 0.0718 | +/-0.0244  | 0.100 | pCi/g |      |          |      |        |       |      |
| Potassium-40                             |           | 39.0      | 0.468  | +/-1.94    | 1.00  | pCi/g |      |          |      |        |       |      |
| Radium-223                               | U         | -0.0827   | 1.04   | +/-0.343   |       | pCi/g |      |          |      |        |       |      |
| Radium-224                               | UI        | 7.93      | 0.930  | +/-0.820   |       | pCi/g |      |          |      |        |       |      |
| Radium-226                               |           | 2.10      | 0.121  | +/-0.163   |       | pCi/g |      |          |      |        |       |      |
| Radium-228                               |           | 2.78      | 0.230  | +/-0.239   | 0.500 | pCi/g |      |          |      |        |       |      |
| Ruthenium-106                            | U         | -0.0604   | 0.543  | +/-0.161   | 0.800 | pCi/g |      |          |      |        |       |      |
| Sodium-22                                | U         | -0.00188  | 0.0868 | +/-0.0263  | 0.080 | pCi/g |      |          |      |        |       |      |
| Strontium-85                             | U         | 0.0625    | 0.0755 | +/-0.0236  |       | pCi/g |      |          |      |        |       |      |
| Thallium-208                             |           | 0.785     | 0.068  | +/-0.0675  | 0.080 | pCi/g |      |          |      |        |       |      |

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8486  
Sample ID: 247964002

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|--------|-----------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |           |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |        |           |       |       |    |         |          |      |        |      |
| Thorium-227                              | U         | -0.0777 | 0.400  | +/-0.123  |       | pCi/g |    |         |          |      |        |      |
| Thorium-231                              | U         | -0.0827 | 1.04   | +/-0.343  |       | pCi/g |    |         |          |      |        |      |
| Thorium-234                              |           | 2.61    | 0.867  | +/-0.540  | 2.00  | pCi/g |    |         |          |      |        |      |
| Tin-113                                  | U         | 0.0074  | 0.079  | +/-0.023  | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-235                              | U         | 0.144   | 0.327  | +/-0.0932 | 0.500 | pCi/g |    |         |          |      |        |      |
| Yttrium-88                               | U         | 0.0382  | 0.0699 | +/-0.0186 | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |         |        |           |       |       |    |         |          |      |        |      |
| <i>H3 "As Received"</i>                  |           |         |        |           |       |       |    |         |          |      |        |      |
| Tritium                                  | U         | -18.1   | 176    | +/-48.5   | 250   | pCi/L |    | KXK2    | 03/15/10 | 1024 | 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery% | Acceptable Limits |
|---------------------------|------------------------------|-----------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 85.7      | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 94.0      | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 89.4      | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded

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Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8486  
Sample ID: 247964002

Project: LANL01004  
Client ID: LANL010

| Parameter | Qualifier | Result | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|

J Value is estimated  
M M if above MDC and less than LLD  
M Matrix Related Failure  
N/A RPD or %Recovery limits do not apply.  
ND Analyte concentration is not detected above the detection limit  
NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy--Uncertain identification  
UJ Gamma Spectroscopy--Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.



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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8487  
Sample ID: 247964003  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 5.4%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU        | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|--------|------------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |         |        |            |       |       |    |         |          |      |        |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |         |        |            |       |       |    |         |          |      |        |      |
| Americium-241                            | U         | 0.00218 | 0.0195 | +/-0.00171 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 1114 | 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |         |        |            |       |       |    |         |          |      |        |      |
| Plutonium-238                            | U         | 0.00386 | 0.020  | +/-0.00339 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 2224 | 962402 | 2    |
| Plutonium-239/240                        | U         | 0.00193 | 0.0169 | +/-0.00239 | 0.050 | pCi/g |    |         |          |      |        |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |         |        |            |       |       |    |         |          |      |        |      |
| Uranium-233/234                          |           | 1.40    | 0.0992 | +/-0.123   | 0.100 | pCi/g |    | JXH2    | 03/22/10 | 2119 | 962404 | 3    |
| Uranium-235/236                          |           | 0.0957  | 0.0606 | +/-0.0224  | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-238                              |           | 1.40    | 0.0698 | +/-0.123   | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |            |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |        |            |       |       |    |         |          |      |        |      |
| Americium-241                            | UI        | 0.116   | 0.0992 | +/-0.0313  | 0.200 | pCi/g |    | MXR1    | 03/10/10 | 2308 | 958216 | 4    |
| Bismuth-211                              | UI        | 6.26    | 0.306  | +/-0.330   |       | pCi/g |    |         |          |      |        |      |
| Bismuth-214                              |           | 2.05    | 0.105  | +/-0.119   | 0.200 | pCi/g |    |         |          |      |        |      |
| Cadmium-109                              | UI        | 5.88    | 0.867  | +/-0.445   |       | pCi/g |    |         |          |      |        |      |
| Cerium-139                               | U         | 0.00166 | 0.0466 | +/-0.0139  | 0.050 | pCi/g |    |         |          |      |        |      |
| Cesium-134                               | UI        | 0.131   | 0.0886 | +/-0.0343  | 0.100 | pCi/g |    |         |          |      |        |      |
| Cesium-137                               | U         | -0.0138 | 0.0592 | +/-0.0185  | 0.100 | pCi/g |    |         |          |      |        |      |
| Cobalt-60                                | U         | 0.0214  | 0.0608 | +/-0.018   | 0.100 | pCi/g |    |         |          |      |        |      |
| Europium-152                             | U         | -0.0853 | 0.147  | +/-0.0783  | 0.200 | pCi/g |    |         |          |      |        |      |
| Lanthanum-140                            | U         | 0.141   | 0.170  | +/-0.050   |       | pCi/g |    |         |          |      |        |      |
| Lead-212                                 |           | 2.57    | 0.0833 | +/-0.149   | 0.100 | pCi/g |    |         |          |      |        |      |
| Lead-214                                 |           | 2.27    | 0.105  | +/-0.135   | 0.100 | pCi/g |    |         |          |      |        |      |
| Mercury-203                              | U         | 0.0465  | 0.0628 | +/-0.0201  | 0.100 | pCi/g |    |         |          |      |        |      |
| Potassium-40                             |           | 35.5    | 0.505  | +/-1.33    | 1.00  | pCi/g |    |         |          |      |        |      |
| Radium-223                               | U         | -0.167  | 0.954  | +/-0.326   |       | pCi/g |    |         |          |      |        |      |
| Radium-224                               | UI        | 7.22    | 0.892  | +/-0.650   |       | pCi/g |    |         |          |      |        |      |
| Radium-226                               |           | 2.05    | 0.105  | +/-0.119   |       | pCi/g |    |         |          |      |        |      |
| Radium-228                               |           | 2.71    | 0.217  | +/-0.225   | 0.500 | pCi/g |    |         |          |      |        |      |
| Ruthenium-106                            | U         | 0.275   | 0.519  | +/-0.152   | 0.800 | pCi/g |    |         |          |      |        |      |
| Sodium-22                                | U         | -0.0139 | 0.0696 | +/-0.0219  | 0.080 | pCi/g |    |         |          |      |        |      |
| Strontium-85                             | UI        | 0.083   | 0.0638 | +/-0.020   |       | pCi/g |    |         |          |      |        |      |
| Thallium-208                             |           | 0.847   | 0.0543 | +/-0.0481  | 0.080 | pCi/g |    |         |          |      |        |      |

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Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID:  
Sample ID:

RE36-10-8487  
247964003

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result   | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time Batch  | Mtd. |
|--|-----------|----------|--------|-----------|-------|-------|----|---------|----------|-------------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |          |        |           |       |       |    |         |          |             |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |          |        |           |       |       |    |         |          |             |      |
| Thorium-227                              | U         | 0.057    | 0.385  | +/-0.111  |       | pCi/g |    |         |          |             |      |
| Thorium-231                              | U         | -0.167   | 0.954  | +/-0.326  |       | pCi/g |    |         |          |             |      |
| Thorium-234                              |           | 1.61     | 0.990  | +/-0.434  | 2.00  | pCi/g |    |         |          |             |      |
| Tin-113                                  | U         | -0.00234 | 0.0704 | +/-0.0209 | 0.100 | pCi/g |    |         |          |             |      |
| Uranium-235                              | U         | 0.265    | 0.318  | +/-0.0947 | 0.500 | pCi/g |    |         |          |             |      |
| Yttrium-88                               | U         | 0.0161   | 0.0521 | +/-0.0149 | 0.100 | pCi/g |    |         |          |             |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |          |        |           |       |       |    |         |          |             |      |
| <i>H3 "As Received"</i>                  |           |          |        |           |       |       |    |         |          |             |      |
| Tritium                                  | U         | -8.27    | 178    | +/-49.3   | 250   | pCi/L |    | KXK2    | 03/15/10 | 1102 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery % | Acceptable Limits |
|---------------------------|------------------------------|------------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 94.0       | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 99.0       | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 96.9       | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8487  
Sample ID: 247964003  
Project: LANL01004  
Client ID: LANL010

| Parameter | Qualifier | Result | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|

J Value is estimated  
M M if above MDC and less than LLD  
M Matrix Related Failure  
N/A RPD or %Recovery limits do not apply.  
ND Analyte concentration is not detected above the detection limit  
NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy--Uncertain identification  
UJ Gamma Spectroscopy--Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8462  
Sample ID: 247964004  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 1.51%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU        | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|--------|------------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |         |        |            |       |       |    |         |          |      |        |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |         |        |            |       |       |    |         |          |      |        |      |
| Americium-241                            | U         | 0.0025  | 0.0211 | +/-0.0019  | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 0305 | 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |         |        |            |       |       |    |         |          |      |        |      |
| Plutonium-238                            | U         | 0.00943 | 0.0252 | +/-0.00704 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 2224 | 962402 | 2    |
| Plutonium-239/240                        | U         | 0.00433 | 0.0213 | +/-0.00357 | 0.050 | pCi/g |    |         |          |      |        |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |         |        |            |       |       |    |         |          |      |        |      |
| Uranium-233/234                          |           | 1.16    | 0.100  | +/-0.105   | 0.100 | pCi/g |    | JXH2    | 03/22/10 | 2119 | 962404 | 3    |
| Uranium-235/236                          | U         | 0.0439  | 0.0611 | +/-0.0155  | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-238                              |           | 1.26    | 0.0703 | +/-0.113   | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |            |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |        |            |       |       |    |         |          |      |        |      |
| Americium-241                            | U         | -0.0424 | 0.0916 | +/-0.0299  | 0.200 | pCi/g |    | MXR1    | 03/10/10 | 2309 | 958216 | 4    |
| Bismuth-211                              | UI        | 5.60    | 0.324  | +/-0.333   |       | pCi/g |    |         |          |      |        |      |
| Bismuth-214                              |           | 1.92    | 0.118  | +/-0.129   | 0.200 | pCi/g |    |         |          |      |        |      |
| Cadmium-109                              | UI        | 4.96    | 0.872  | +/-0.419   |       | pCi/g |    |         |          |      |        |      |
| Cerium-139                               | U         | -0.0279 | 0.0439 | +/-0.0129  | 0.050 | pCi/g |    |         |          |      |        |      |
| Cesium-134                               | UI        | 0.172   | 0.0923 | +/-0.0477  | 0.100 | pCi/g |    |         |          |      |        |      |
| Cesium-137                               | U         | -0.0406 | 0.0577 | +/-0.0199  | 0.100 | pCi/g |    |         |          |      |        |      |
| Cobalt-60                                | U         | 0.0225  | 0.0682 | +/-0.0198  | 0.100 | pCi/g |    |         |          |      |        |      |
| Europium-152                             | U         | -0.0145 | 0.151  | +/-0.0528  | 0.200 | pCi/g |    |         |          |      |        |      |
| Lanthanum-140                            | U         | 0.0109  | 0.189  | +/-0.0573  |       | pCi/g |    |         |          |      |        |      |
| Lead-212                                 |           | 2.38    | 0.0835 | +/-0.133   | 0.100 | pCi/g |    |         |          |      |        |      |
| Lead-214                                 |           | 2.03    | 0.118  | +/-0.133   | 0.100 | pCi/g |    |         |          |      |        |      |
| Mercury-203                              | U         | 0.0629  | 0.0647 | +/-0.0208  | 0.100 | pCi/g |    |         |          |      |        |      |
| Potassium-40                             |           | 35.1    | 0.584  | +/-1.74    | 1.00  | pCi/g |    |         |          |      |        |      |
| Radium-223                               | U         | -0.131  | 0.978  | +/-0.350   |       | pCi/g |    |         |          |      |        |      |
| Radium-224                               | UI        | 5.46    | 0.895  | +/-0.539   |       | pCi/g |    |         |          |      |        |      |
| Radium-226                               |           | 1.92    | 0.118  | +/-0.129   |       | pCi/g |    |         |          |      |        |      |
| Radium-228                               |           | 2.71    | 0.238  | +/-0.226   | 0.500 | pCi/g |    |         |          |      |        |      |
| Ruthenium-106                            | U         | -0.193  | 0.498  | +/-0.155   | 0.800 | pCi/g |    |         |          |      |        |      |
| Sodium-22                                | U         | 0.0143  | 0.0736 | +/-0.0216  | 0.080 | pCi/g |    |         |          |      |        |      |
| Strontium-85                             | UI        | 0.121   | 0.0725 | +/-0.0225  |       | pCi/g |    |         |          |      |        |      |
| Thallium-208                             |           | 0.775   | 0.0573 | +/-0.0536  | 0.080 | pCi/g |    |         |          |      |        |      |

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8462  
Sample ID: 247964004

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result  | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|---------|--------|-----------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |         |        |           |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |         |        |           |       |       |    |         |          |      |        |      |
| Thorium-227                              | U         | 0.244   | 0.382  | +/-0.110  |       | pCi/g |    |         |          |      |        |      |
| Thorium-231                              | U         | -0.131  | 0.978  | +/-0.350  |       | pCi/g |    |         |          |      |        |      |
| Thorium-234                              |           | 2.45    | 0.919  | +/-0.527  | 2.00  | pCi/g |    |         |          |      |        |      |
| Tin-113                                  | U         | -0.0107 | 0.0718 | +/-0.0209 | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-235                              | U         | 0.0302  | 0.305  | +/-0.0887 | 0.500 | pCi/g |    |         |          |      |        |      |
| Yttrium-88                               | U         | 0.00844 | 0.0562 | +/-0.0164 | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |         |        |           |       |       |    |         |          |      |        |      |
| <i>H3 "As Received"</i>                  |           |         |        |           |       |       |    |         |          |      |        |      |
| Tritium                                  | U         | 93.2    | 158    | +/-48.9   | 250   | pCi/L |    | KXK2    | 03/22/10 | 1753 | 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery% | Acceptable Limits |
|---------------------------|------------------------------|-----------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 90.8      | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 88.8      | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 95.8      | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded

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Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8462  
Sample ID: 247964004

Project: LANL01004  
Client ID: LANL010

| Parameter | Qualifier | Result | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|

J Value is estimated  
M M if above MDC and less than LLD  
M Matrix Related Failure  
N/A RPD or %Recovery limits do not apply.  
ND Analyte concentration is not detected above the detection limit  
NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy--Uncertain identification  
UJ Gamma Spectroscopy--Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.

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Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8463  
Sample ID: 247964005  
Matrix: R  
Collect Date: 19-FEB-10  
Receive Date: 25-FEB-10  
Collector: Client  
Moisture: 2.73%

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result   | DL     | TPU        | RL    | Units | DF | Analyst | Date     | Time Batch  | Mtd. |
|--|-----------|----------|--------|------------|-------|-------|----|---------|----------|-------------|------|
| <b>Rad Alpha Spec Analysis</b>           |           |          |        |            |       |       |    |         |          |             |      |
| <i>AM241 "Dry Weight Corrected"</i>      |           |          |        |            |       |       |    |         |          |             |      |
| Americium-241                            | U         | 0.00178  | 0.0206 | +/-0.00272 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 0305 962401 | 1    |
| <i>ISOPU "Dry Weight Corrected"</i>      |           |          |        |            |       |       |    |         |          |             |      |
| Plutonium-238                            | U         | -0.00443 | 0.0223 | +/-0.00586 | 0.050 | pCi/g |    | JXH2    | 03/22/10 | 2224 962402 | 2    |
| Plutonium-239/240                        | U         | 0.00717  | 0.0188 | +/-0.00396 | 0.050 | pCi/g |    |         |          |             |      |
| <i>ISOU "Dry Weight Corrected"</i>       |           |          |        |            |       |       |    |         |          |             |      |
| Uranium-233/234                          |           | 1.24     | 0.0958 | +/-0.110   | 0.100 | pCi/g |    | JXH2    | 03/22/10 | 2119 962404 | 3    |
| Uranium-235/236                          |           | 0.0714   | 0.0585 | +/-0.019   | 0.100 | pCi/g |    |         |          |             |      |
| Uranium-238                              |           | 1.20     | 0.0673 | +/-0.107   | 0.100 | pCi/g |    |         |          |             |      |
| <b>Rad Gamma Spec Analysis</b>           |           |          |        |            |       |       |    |         |          |             |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |          |        |            |       |       |    |         |          |             |      |
| Americium-241                            | U         | 0.296    | 0.424  | +/-0.136   | 0.200 | pCi/g |    | MXR1    | 03/10/10 | 2310 958216 | 4    |
| Bismuth-211                              | UI        | 6.50     | 0.338  | +/-0.391   |       | pCi/g |    |         |          |             |      |
| Bismuth-214                              |           | 1.89     | 0.109  | +/-0.122   | 0.200 | pCi/g |    |         |          |             |      |
| Cadmium-109                              | UI        | 4.72     | 1.36   | +/-0.583   |       | pCi/g |    |         |          |             |      |
| Cerium-139                               | U         | -0.014   | 0.0532 | +/-0.0163  | 0.050 | pCi/g |    |         |          |             |      |
| Cesium-134                               | UI        | 0.121    | 0.0892 | +/-0.0254  | 0.100 | pCi/g |    |         |          |             |      |
| Cesium-137                               | U         | -0.0275  | 0.0559 | +/-0.0172  | 0.100 | pCi/g |    |         |          |             |      |
| Cobalt-60                                | U         | 0.0216   | 0.0643 | +/-0.0191  | 0.100 | pCi/g |    |         |          |             |      |
| Europium-152                             | U         | -0.0271  | 0.162  | +/-0.0534  | 0.200 | pCi/g |    |         |          |             |      |
| Lanthanum-140                            | U         | 0.103    | 0.162  | +/-0.0494  |       | pCi/g |    |         |          |             |      |
| Lead-212                                 |           | 2.58     | 0.096  | +/-0.165   | 0.100 | pCi/g |    |         |          |             |      |
| Lead-214                                 |           | 2.36     | 0.122  | +/-0.156   | 0.100 | pCi/g |    |         |          |             |      |
| Mercury-203                              | UI        | 0.0988   | 0.0777 | +/-0.0247  | 0.100 | pCi/g |    |         |          |             |      |
| Potassium-40                             |           | 36.1     | 0.502  | +/-1.96    | 1.00  | pCi/g |    |         |          |             |      |
| Radium-223                               | U         | 0.528    | 1.10   | +/-0.363   |       | pCi/g |    |         |          |             |      |
| Radium-224                               | UI        | 6.50     | 1.03   | +/-0.713   |       | pCi/g |    |         |          |             |      |
| Radium-226                               |           | 1.89     | 0.109  | +/-0.122   |       | pCi/g |    |         |          |             |      |
| Radium-228                               |           | 2.67     | 0.216  | +/-0.215   | 0.500 | pCi/g |    |         |          |             |      |
| Ruthenium-106                            | U         | 0.0196   | 0.507  | +/-0.155   | 0.800 | pCi/g |    |         |          |             |      |
| Sodium-22                                | U         | -0.0045  | 0.0737 | +/-0.0229  | 0.080 | pCi/g |    |         |          |             |      |
| Strontium-85                             | UI        | 0.122    | 0.0755 | +/-0.0237  |       | pCi/g |    |         |          |             |      |
| Thallium-208                             |           | 0.810    | 0.0577 | +/-0.0551  | 0.080 | pCi/g |    |         |          |             |      |

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Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8463  
Sample ID: 247964005

Project: LANL01004  
Client ID: LANL010

| Parameter                                | Qualifier | Result   | DL     | TPU       | RL    | Units | DF | Analyst | Date     | Time | Batch  | Mtd. |
|--|-----------|----------|--------|-----------|-------|-------|----|---------|----------|------|--------|------|
| <b>Rad Gamma Spec Analysis</b>           |           |          |        |           |       |       |    |         |          |      |        |      |
| <i>GAMMA SPEC "Dry Weight Corrected"</i> |           |          |        |           |       |       |    |         |          |      |        |      |
| Thorium-227                              | U         | -0.0775  | 0.434  | +/-0.128  |       | pCi/g |    |         |          |      |        |      |
| Thorium-231                              | U         | 0.528    | 1.10   | +/-0.363  |       | pCi/g |    |         |          |      |        |      |
| Thorium-234                              |           | 3.37     | 3.15   | +/-1.37   | 2.00  | pCi/g |    |         |          |      |        |      |
| Tin-113                                  | U         | -0.00493 | 0.0794 | +/-0.0238 | 0.100 | pCi/g |    |         |          |      |        |      |
| Uranium-235                              | U         | -0.0144  | 0.353  | +/-0.109  | 0.500 | pCi/g |    |         |          |      |        |      |
| Yttrium-88                               | U         | 0.0119   | 0.0548 | +/-0.016  | 0.100 | pCi/g |    |         |          |      |        |      |
| <b>Rad Liquid Scintillation Analysis</b> |           |          |        |           |       |       |    |         |          |      |        |      |
| <i>H3 "As Received"</i>                  |           |          |        |           |       |       |    |         |          |      |        |      |
| Tritium                                  | U         | -8.15    | 195    | +/-55.2   | 250   | pCi/L |    | KXK2    | 03/15/10 | 1217 | 964049 | 5    |

### The following Analytical Methods were performed

| Method | Description                         |
|--------|-------------------------------------|
| 1      | DOE EML HASL-300, Am-05-RC Modified |
| 2      | DOE EML HASL-300, Pu-11-RC Modified |
| 3      | DOE EML HASL-300, U-02-RC Modified  |
| 4      | DOE HASL 300, 4.5.2.3/Ga-01-R       |
| 5      | GL-RAD-A-002                        |

| Surrogate/Tracer recovery | Test                         | Recovery % | Acceptable Limits |
|---------------------------|------------------------------|------------|-------------------|
| Americium-243 Tracer      | AM241 "Dry Weight Corrected" | 91.8       | (50%-105%)        |
| Plutonium-236 Tracer      | ISOPU "Dry Weight Corrected" | 88.9       | (50%-105%)        |
| Uranium-232 Tracer        | ISOU "Dry Weight Corrected"  | 97.2       | (50%-105%)        |

### Notes:

TPU is calculated at the 67% confidence level (1-sigma).

The Qualifiers in this report are defined as follows :

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded



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## Certificate of Analysis

Company : Los Alamos National Laboratory  
Address : PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico 87545  
Contact: Ms. Joylene Valdez  
Project: LANL ER Project

Report Date: March 23, 2010

Client Sample ID: RE36-10-8463 Project: LANL01004  
Sample ID: 247964005 Client ID: LANL010

| Parameter | Qualifier | Result | DL | TPU | RL | Units | DF | Analyst | Date | Time | Batch | Mtd. |
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|
|-----------|-----------|--------|----|-----|----|-------|----|---------|------|------|-------|------|

J Value is estimated  
M M if above MDC and less than LLD  
M Matrix Related Failure  
N/A RPD or %Recovery limits do not apply.  
ND Analyte concentration is not detected above the detection limit  
NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
R Sample results are rejected  
U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.  
UI Gamma Spectroscopy--Uncertain identification  
UJ Gamma Spectroscopy--Uncertain identification  
X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier  
Y QC Samples were not spiked with this compound  
^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.  
h Preparation or preservation holding time was exceeded  
The above sample is reported on a dry weight basis.

# QUALITY CONTROL DATA

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## QC Summary

Report Date: March 23, 2010

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**Client :** Los Alamos National Laboratory  
PO Box 1663  
TA-03, SM271, Drop Pt. 02U, Rm  
Los Alamos, New Mexico  
**Contact:** Ms. Joylene Valdez  
**Workorder:** 247964

| Parmname              | NOM       | Sample | Qual       | QC | Units      | RER   | REC%   | Range      | Anlst | Date          | Time |
|-----------------------|-----------|--------|------------|----|------------|-------|--------|------------|-------|---------------|------|
| <b>Rad Alpha Spec</b> |           |        |            |    |            |       |        |            |       |               |      |
| Batch                 | 962401    |        |            |    |            |       |        |            |       |               |      |
| QC1202064504          | 247970001 | DUP    |            |    |            |       |        |            |       |               |      |
| Americium-241         |           | U      | 0.00284    | U  | 0.0027     | pCi/g | 0.0128 | (0-1)      | JXH2  | 03/22/1003:06 |      |
|                       |           | TPU:   | +/-0.00257 |    | +/-0.00319 |       |        |            |       |               |      |
|                       |           | Yield: | 90.5       |    | 63.2       |       |        |            |       |               |      |
| QC1202064505          | LCS       |        |            |    |            |       |        |            |       |               |      |
| Americium-241         |           | 33.1   |            |    | 30.5       | pCi/g | 91.9   | (75%-125%) |       | 03/22/1003:06 |      |
|                       |           | TPU:   |            |    | +/-2.22    |       |        |            |       |               |      |
|                       |           | Yield: |            |    | 97.9       |       |        |            |       |               |      |
| QC1202064503          | MB        |        |            |    |            |       |        |            |       |               |      |
| Americium-241         |           | U      | -0.000603  |    | pCi/g      |       |        |            |       | 03/22/1003:06 |      |
|                       |           | TPU:   | +/-0.00168 |    |            |       |        |            |       |               |      |
|                       |           | Yield: | 93.8       |    |            |       |        |            |       |               |      |
| Batch                 | 962402    |        |            |    |            |       |        |            |       |               |      |
| QC1202064507          | 247970001 | DUP    |            |    |            |       |        |            |       |               |      |
| Plutonium-238         |           | U      | 0.00492    | U  | 0.00327    | pCi/g | 0.160  | (0-1)      | JXH2  | 03/22/1022:24 |      |
|                       |           | TPU:   | +/-0.00286 |    | +/-0.00232 |       |        |            |       |               |      |
|                       |           | Yield: | 86.7       |    | 85.0       |       |        |            |       |               |      |
| Plutonium-239/240     |           | U      | 0.00164    | U  | 0.000458   | pCi/g | 0.162  | (0-1)      |       |               |      |
|                       |           | TPU:   | +/-0.00164 |    | +/-0.00202 |       |        |            |       |               |      |
|                       |           | Yield: | 86.7       |    | 85.0       |       |        |            |       |               |      |
| QC1202064508          | LCS       |        |            |    |            |       |        |            |       |               |      |
| Plutonium-238         |           |        |            |    | 7.32       | pCi/g |        | (75%-125%) |       | 03/22/1009:59 |      |
|                       |           | TPU:   |            |    | +/-0.607   |       |        |            |       |               |      |
|                       |           | Yield: |            |    | 93.4       |       |        |            |       |               |      |
| Plutonium-239/240     |           | 41.8   |            |    | 38.0       | pCi/g | 90.9   | (75%-125%) |       |               |      |
|                       |           | TPU:   |            |    | +/-2.61    |       |        |            |       |               |      |
|                       |           | Yield: |            |    | 93.4       |       |        |            |       |               |      |
| QC1202064506          | MB        |        |            |    |            |       |        |            |       |               |      |
| Plutonium-238         |           | U      | 0.00841    |    | pCi/g      |       |        |            |       | 03/22/1022:24 |      |
|                       |           | TPU:   | +/-0.00464 |    |            |       |        |            |       |               |      |
|                       |           | Yield: | 90.6       |    |            |       |        |            |       |               |      |
| Plutonium-239/240     |           | U      | 0.00165    |    | pCi/g      |       |        |            |       |               |      |
|                       |           | TPU:   | +/-0.00419 |    |            |       |        |            |       |               |      |
|                       |           | Yield: | 90.6       |    |            |       |        |            |       |               |      |
| Batch                 | 962404    |        |            |    |            |       |        |            |       |               |      |
| QC1202064510          | 247970001 | DUP    |            |    |            |       |        |            |       |               |      |
| Uranium-233/234       |           |        | 0.853      |    | 0.879      | pCi/g | 0.079  | (0-1)      | JXH2  | 03/20/1012:43 |      |
|                       |           | TPU:   | +/-0.0808  |    | +/-0.0807  |       |        |            |       |               |      |
|                       |           | Yield: | 98.9       |    | 96.9       |       |        |            |       |               |      |
| Uranium-235/236       |           | U      | 0.0532     | U  | 0.0473     | pCi/g | 0.0931 | (0-1)      |       |               |      |
|                       |           | TPU:   | +/-0.0163  |    | +/-0.0154  |       |        |            |       |               |      |
|                       |           | Yield: | 98.9       |    | 96.9       |       |        |            |       |               |      |
| Uranium-238           |           |        | 0.814      |    | 0.974      | pCi/g | 0.483  | (0-1)      |       |               |      |
|                       |           | TPU:   | +/-0.0781  |    | +/-0.0873  |       |        |            |       |               |      |

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## QC Summary

Workorder: 247964

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| Parmname        | NOM       | Sample | Qual      | QC         | Units     | RER   | REC%    | Range      | Anlst | Date     | Time  |
|-----------------|-----------|--------|-----------|------------|-----------|-------|---------|------------|-------|----------|-------|
| Rad Alpha Spec  |           |        |           |            |           |       |         |            |       |          |       |
| Batch           | 962404    |        |           |            |           |       |         |            |       |          |       |
|                 |           | Yield: | 98.9      | 96.9       |           |       |         |            |       |          |       |
| QC1202064511    | LCS       |        |           |            |           |       |         |            |       |          |       |
| Uranium-233/234 |           |        |           | 6.71       | pCi/g     |       |         |            |       |          |       |
|                 |           | TPU:   |           | +/-0.641   |           |       |         |            |       |          |       |
|                 |           | Yield: |           | 74.0       |           |       |         |            |       |          |       |
| Uranium-235/236 |           |        |           | 0.358      | pCi/g     |       |         |            |       |          |       |
|                 |           | TPU:   |           | +/-0.0966  |           |       |         |            |       |          |       |
|                 |           | Yield: |           | 74.0       |           |       |         |            |       |          |       |
| Uranium-238     | 5.75      |        |           | 5.52       | pCi/g     |       | 96      | (75%-125%) |       |          |       |
|                 |           | TPU:   |           | +/-0.546   |           |       |         |            |       |          |       |
|                 |           | Yield: |           | 74.0       |           |       |         |            |       |          |       |
| QC1202064509    | MB        |        |           |            |           |       |         |            |       |          |       |
| Uranium-233/234 |           |        | U         | 0.00681    | pCi/g     |       |         |            |       |          |       |
|                 |           | TPU:   |           | +/-0.00298 |           |       |         |            |       |          |       |
|                 |           | Yield: |           | 104        |           |       |         |            |       |          |       |
| Uranium-235/236 |           |        | U         | 0.00157    | pCi/g     |       |         |            |       |          |       |
|                 |           | TPU:   |           | +/-0.00414 |           |       |         |            |       |          |       |
|                 |           | Yield: |           | 104        |           |       |         |            |       |          |       |
| Uranium-238     |           |        | U         | 0.0114     | pCi/g     |       |         |            |       |          |       |
|                 |           | TPU:   |           | +/-0.00428 |           |       |         |            |       |          |       |
|                 |           | Yield: |           | 104        |           |       |         |            |       |          |       |
| Rad Gamma Spec  |           |        |           |            |           |       |         |            |       |          |       |
| Batch           | 958216    |        |           |            |           |       |         |            |       |          |       |
| QC1202054949    | 247970001 | DUP    |           |            |           |       |         |            |       |          |       |
| Americium-241   |           | U      | 0.0561    | U          | -0.328    | pCi/g | 0.969   | (0-1)      | MXR1  | 03/11/10 | 19:27 |
|                 |           | TPU:   | +/-0.0848 |            | +/-0.114  |       |         |            |       |          |       |
| Bismuth-211     |           | UI     | 4.41      | UI         | 3.76      | pCi/g | 0.640   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.235  |            | +/-0.273  |       |         |            |       |          |       |
| Bismuth-214     |           |        | 1.19      |            | 1.25      | pCi/g | 0.136   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.0956 |            | +/-0.114  |       |         |            |       |          |       |
| Cadmium-109     |           | UI     | 3.51      | UI         | 3.95      | pCi/g | 0.187   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.530  |            | +/-0.665  |       |         |            |       |          |       |
| Cerium-139      |           | U      | 0.0125    | U          | 0.00328   | pCi/g | 0.151   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.013  |            | +/-0.0174 |       |         |            |       |          |       |
| Cesium-134      |           | UI     | 0.102     | U          | 0.0941    | pCi/g | 0.0636  | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.0315 |            | +/-0.0298 |       |         |            |       |          |       |
| Cesium-137      |           | U      | -0.0137   | U          | 0.0241    | pCi/g | 0.490   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.0155 |            | +/-0.0231 |       |         |            |       |          |       |
| Cobalt-60       |           | U      | 0.0227    | U          | 0.00845   | pCi/g | 0.184   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.0156 |            | +/-0.0231 |       |         |            |       |          |       |
| Europium-152    |           | U      | -0.0631   | U          | -0.089    | pCi/g | 0.113   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.0443 |            | +/-0.0699 |       |         |            |       |          |       |
| Lanthanum-140   |           | U      | -0.0724   | U          | -0.0741   | pCi/g | 0.00948 | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.0371 |            | +/-0.0525 |       |         |            |       |          |       |
| Lead-212        |           |        | 1.90      |            | 1.84      | pCi/g | 0.161   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.0858 |            | +/-0.0915 |       |         |            |       |          |       |
| Lead-214        |           |        | 1.60      |            | 1.36      | pCi/g | 0.585   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.096  |            | +/-0.106  |       |         |            |       |          |       |
| Mercury-203     |           | UI     | 0.059     | U          | 0.0214    | pCi/g | 0.400   | (0-1)      |       |          |       |
|                 |           | TPU:   | +/-0.0245 |            | +/-0.0225 |       |         |            |       |          |       |

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## QC Summary

Workorder: 247964

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| Parmname              | NOM    | Sample    | Qual | QC        | Units | RER     | REC% | Range      | Anlst | Date Time     |
|-----------------------|--------|-----------|------|-----------|-------|---------|------|------------|-------|---------------|
| <b>Rad Gamma Spec</b> |        |           |      |           |       |         |      |            |       |               |
| Batch                 | 958216 |           |      |           |       |         |      |            |       |               |
| Potassium-40          |        | 38.4      |      | 35.4      | pCi/g | 0.442   |      | (0-1)      |       |               |
|                       | TPU:   | +/-1.66   |      | +/-1.69   |       |         |      |            |       |               |
| Radium-223            | U      | 0.0551    | U    | -0.744    | pCi/g | 0.574   |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.299  |      | +/-0.397  |       |         |      |            |       |               |
| Radium-224            | UI     | 4.74      | UI   | 4.90      | pCi/g | 0.0641  |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.568  |      | +/-0.719  |       |         |      |            |       |               |
| Radium-226            |        | 1.19      |      | 1.25      | pCi/g | 0.136   |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.0956 |      | +/-0.114  |       |         |      |            |       |               |
| Radium-228            |        | 2.15      |      | 2.22      | pCi/g | 0.0755  |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.198  |      | +/-0.225  |       |         |      |            |       |               |
| Ruthenium-106         | U      | -0.0502   | U    | 0.110     | pCi/g | 0.244   |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.137  |      | +/-0.191  |       |         |      |            |       |               |
| Sodium-22             | U      | -0.0162   | U    | -0.0314   | pCi/g | 0.150   |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.0212 |      | +/-0.0295 |       |         |      |            |       |               |
| Strontium-85          | UI     | 0.0725    | U    | 0.00568   | pCi/g | 0.773   |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.0194 |      | +/-0.0238 |       |         |      |            |       |               |
| Thallium-208          |        | 0.602     |      | 0.602     | pCi/g | 0.00374 |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.0406 |      | +/-0.0529 |       |         |      |            |       |               |
| Thorium-227           | U      | -0.121    | U    | -0.0806   | pCi/g | 0.0777  |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.109  |      | +/-0.149  |       |         |      |            |       |               |
| Thorium-231           | U      | 0.0551    | U    | -0.744    | pCi/g | 0.574   |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.299  |      | +/-0.397  |       |         |      |            |       |               |
| Thorium-234           | U      | 1.51      | U    | 2.30      | pCi/g | 0.231   |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.754  |      | +/-0.962  |       |         |      |            |       |               |
| Tin-113               | U      | 0.00257   | U    | -0.00139  | pCi/g | 0.0438  |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.0181 |      | +/-0.0271 |       |         |      |            |       |               |
| Uranium-235           | U      | 0.0604    | U    | 0.140     | pCi/g | 0.183   |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.0981 |      | +/-0.119  |       |         |      |            |       |               |
| Yttrium-88            | U      | -0.00182  | U    | 0.00479   | pCi/g | 0.0968  |      | (0-1)      |       |               |
|                       | TPU:   | +/-0.0135 |      | +/-0.0206 |       |         |      |            |       |               |
| QC1202054950          | LCS    |           |      |           |       |         |      |            |       |               |
| Americium-241         | 15.9   |           |      | 13.4      | pCi/g |         | 84.1 | (75%-125%) |       | 03/11/1019:35 |
|                       | TPU:   |           |      | +/-0.594  |       |         |      |            |       |               |
| Bismuth-211           |        |           |      | 2.12      | pCi/g |         |      |            |       |               |
|                       | TPU:   |           |      | +/-0.346  |       |         |      |            |       |               |
| Bismuth-214           |        |           |      | 0.940     | pCi/g |         |      |            |       |               |
|                       | TPU:   |           |      | +/-0.138  |       |         |      |            |       |               |
| Cadmium-109           |        |           |      | 31.3      | pCi/g |         |      |            |       |               |
|                       | TPU:   |           |      | +/-1.76   |       |         |      |            |       |               |
| Cerium-139            |        |           | U    | 0.0126    | pCi/g |         |      |            |       |               |
|                       | TPU:   |           |      | +/-0.0194 |       |         |      |            |       |               |
| Cesium-134            |        |           | U    | -0.0112   | pCi/g |         |      |            |       |               |
|                       | TPU:   |           |      | +/-0.0579 |       |         |      |            |       |               |
| Cesium-137            | 5.55   |           |      | 6.05      | pCi/g |         | 109  | (75%-125%) |       |               |
|                       | TPU:   |           |      | +/-0.373  |       |         |      |            |       |               |
| Cobalt-60             | 6.35   |           |      | 6.62      | pCi/g |         | 104  | (75%-125%) |       |               |
|                       | TPU:   |           |      | +/-0.340  |       |         |      |            |       |               |
| Europium-152          |        |           | U    | -0.0255   | pCi/g |         |      |            |       |               |
|                       | TPU:   |           |      | +/-0.0928 |       |         |      |            |       |               |
| Lanthanum-140         |        |           | U    | -0.0849   | pCi/g |         |      |            |       |               |
|                       | TPU:   |           |      | +/-0.0513 |       |         |      |            |       |               |

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## QC Summary

Workorder: 247964

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| Parmname        | NOM    | Sample Qual | QC         | Units | RER | REC% | Range | Anlst | Date Time     |
|-----------------|--------|-------------|------------|-------|-----|------|-------|-------|---------------|
| Rad Gamma Spec  |        |             |            |       |     |      |       |       |               |
| Batch           | 958216 |             |            |       |     |      |       |       |               |
| Lead-212        |        |             | 1.12       | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0882  |       |     |      |       |       |               |
| Lcad-214        |        |             | 0.770      | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.127   |       |     |      |       |       |               |
| Mercury-203     |        | U           | -0.033     | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0286  |       |     |      |       |       |               |
| Potassium-40    |        | U           | 1.28       | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.337   |       |     |      |       |       |               |
| Radium-223      |        | U           | -0.0389    | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.570   |       |     |      |       |       |               |
| Radium-224      |        |             | 2.55       | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.720   |       |     |      |       |       |               |
| Radium-226      |        |             | 0.940      | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.138   |       |     |      |       |       |               |
| Radium-228      |        |             | 1.97       | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.448   |       |     |      |       |       |               |
| Ruthenium-106   |        | U           | 0.028      | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.318   |       |     |      |       |       |               |
| Sodium-22       |        | U           | -0.0527    | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.027   |       |     |      |       |       |               |
| Strontium-85    |        | U           | -0.165     | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0403  |       |     |      |       |       |               |
| Thallium-208    |        |             | 0.337      | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0719  |       |     |      |       |       |               |
| Thorium-227     |        | U           | 0.072      | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.209   |       |     |      |       |       |               |
| Thorium-231     |        | U           | -0.0389    | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.570   |       |     |      |       |       |               |
| Thorium-234     |        | U           | 0.382      | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.337   |       |     |      |       |       |               |
| Tin-113         |        | U           | -0.0366    | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0444  |       |     |      |       |       |               |
| Uranium-235     |        |             | 0.445      | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.159   |       |     |      |       |       |               |
| Yttrium-88      |        | U           | 0.0342     | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0319  |       |     |      |       |       |               |
| QC1202054948 MB |        |             |            |       |     |      |       |       |               |
| Americium-241   |        | U           | -0.0085    | pCi/g |     |      |       |       | 03/11/1019:26 |
|                 | TPU:   |             | +/-0.0196  |       |     |      |       |       |               |
| Bismuth-211     |        | U           | 0.0282     | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0505  |       |     |      |       |       |               |
| Bismuth-214     |        | U           | -0.0166    | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0208  |       |     |      |       |       |               |
| Cadmium-109     |        | U           | 0.0734     | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.147   |       |     |      |       |       |               |
| Cerium-139      |        | U           | -0.00955   | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.00616 |       |     |      |       |       |               |
| Cesium-134      |        | U           | 0.00514    | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.00948 |       |     |      |       |       |               |
| Cesium-137      |        | U           | -0.00452   | pCi/g |     |      |       |       |               |
|                 | TPU:   |             | +/-0.0082  |       |     |      |       |       |               |

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## QC Summary

Workorder: 247964

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| Parmname                        | NOM       | Sample | Qual | QC         | Units | RER     | REC%  | Range  | Anlst      | Date  | Time          |
|---------------------------------|-----------|--------|------|------------|-------|---------|-------|--------|------------|-------|---------------|
| <b>Rad Gamma Spec</b>           |           |        |      |            |       |         |       |        |            |       |               |
| Batch                           | 958216    |        |      |            |       |         |       |        |            |       |               |
| Cobalt-60                       |           |        | U    | -0.0121    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.00908 |       |         |       |        |            |       |               |
| Europium-152                    |           |        | U    | -0.0349    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0203  |       |         |       |        |            |       |               |
| Lanthanum-140                   |           |        | U    | 0.0102     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0159  |       |         |       |        |            |       |               |
| Lead-212                        |           |        | U    | -0.0104    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0148  |       |         |       |        |            |       |               |
| Lead-214                        |           |        | U    | 0.0169     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0182  |       |         |       |        |            |       |               |
| Mercury-203                     |           |        | U    | -0.00477   | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0072  |       |         |       |        |            |       |               |
| Potassium-40                    |           |        | U    | 0.0544     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.108   |       |         |       |        |            |       |               |
| Radium-223                      |           |        | U    | -0.227     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.141   |       |         |       |        |            |       |               |
| Radium-224                      |           |        | U    | -0.358     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.142   |       |         |       |        |            |       |               |
| Radium-226                      |           |        | U    | -0.0166    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0208  |       |         |       |        |            |       |               |
| Radium-228                      |           |        | U    | 0.0226     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0326  |       |         |       |        |            |       |               |
| Ruthenium-106                   |           |        | U    | 0.0159     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.079   |       |         |       |        |            |       |               |
| Sodium-22                       |           |        | U    | -0.0119    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.00955 |       |         |       |        |            |       |               |
| Strontium-85                    |           |        | U    | -0.0722    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0161  |       |         |       |        |            |       |               |
| Thallium-208                    |           |        | U    | -0.0218    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0097  |       |         |       |        |            |       |               |
| Thorium-227                     |           |        | U    | 0.00998    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0535  |       |         |       |        |            |       |               |
| Thorium-231                     |           |        | U    | -0.227     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.141   |       |         |       |        |            |       |               |
| Thorium-234                     |           |        | U    | 0.0538     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.222   |       |         |       |        |            |       |               |
| Tin-113                         |           |        | U    | 0.000136   | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.00869 |       |         |       |        |            |       |               |
| Uranium-235                     |           |        | U    | 0.0726     | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.0447  |       |         |       |        |            |       |               |
| Yttrium-88                      |           |        | U    | 0.00542    | pCi/g |         |       |        |            |       |               |
|                                 | TPU:      |        |      | +/-0.00837 |       |         |       |        |            |       |               |
| <b>Rad Liquid Scintillation</b> |           |        |      |            |       |         |       |        |            |       |               |
| Batch                           | 964049    |        |      |            |       |         |       |        |            |       |               |
| QC1202068193                    | 248028005 | DUP    |      |            |       |         |       |        |            |       |               |
| Tritium                         |           |        | U    | 87.9       | U     | 92.1    | pCi/L | 0.0195 | (0-1)      | KXXK2 | 03/15/1022:10 |
|                                 |           |        | TPU: | +/-54.2    |       | +/-54.0 |       |        |            |       |               |
| QC1202068194                    | LCS       |        |      |            |       |         |       |        |            |       |               |
| Tritium                         | 5530      |        |      |            |       | 5500    | pCi/L | 99.3   | (80%-120%) |       | 03/15/1022:48 |
|                                 |           |        | TPU: |            |       | +/-456  |       |        |            |       |               |

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## QC Summary

Workorder: 247964

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| Parmname                 | NOM    | Sample Qual | QC      | Units | RER | REC% | Range | Anlst | Date Time     |
|--------------------------|--------|-------------|---------|-------|-----|------|-------|-------|---------------|
| Rad Liquid Scintillation |        |             |         |       |     |      |       |       |               |
| Batch                    | 964049 |             |         |       |     |      |       |       |               |
| QC1202068192             | MB     |             |         |       |     |      |       |       |               |
| Tritium                  |        | U           | -36.1   | pCi/L |     |      |       |       | 03/17/1015:23 |
|                          | TPU:   |             | +/-47.0 |       |     |      |       |       |               |

### Notes:

The Qualifiers in this report are defined as follows:

- \*\* Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- UJ Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- h Preparation or preservation holding time was exceeded

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

\*\* Indicates analyte is a surrogate compound.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



# RAW DATA

## Radiochemistry Batch Checklist, Rev10

Batch# 962401 Product: Am Date: 3/23/10

| Criteria:   | Yes | No | Comments |
|---|-----|----|----------|
| Sample Solids are less than or equal to 100 mg for GAB.   |     |    | N/A      |
| Samples have been blank corrected (if required)   | ✓   |    |          |
| If activity less 10" MDA/ MDC, error is 150% or less of sample activity. If greater 10" MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay. | ✓   |    |          |
| Instrument source check is within limits.   | ✓   |    |          |
| Instrument bkg check is within limits.  | ✓   |    |          |
| Method RDL/ LLD has been met.   | ✓   |    |          |
| If duplicate activities are less 5" MDA/ MDC, then RPD is 100% or less. If greater 5" MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.   | ✓   |    |          |
| Or meets the client's required RER acceptance criteria.   |     |    |          |
| Tracer yield is 15-125% . Carrier yield 25-125%.  | ✓   |    |          |
| Or meets the client's contract acceptance criteria.   |     |    |          |
| Method blank is less than the RDL/ LLD.   | ✓   |    |          |
| (If rad samples, < 5% of lowest activity)   | ✓   |    |          |
| Sample was run within hold time.  | ✓   |    |          |
| Sample was correctly preserved if required.   |     |    | N/A      |
| Smears Taken for Radioactive batches.   |     |    | N/A      |
| Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.   | ✓   |    |          |
| No blank spaces on data forms.  | ✓   |    |          |
| All line outs initialed and dated.  |     |    |          |
| No transcription errors are apparent.   |     |    |          |
| Aux data is correct.  |     |    | N/A      |
| Client Special requirements page has been checked.  | ✓   |    |          |
| Raw Data and/ or spectrum are included and properly statused.   | ✓   |    |          |
| QC data entered into QC database and batch is in REVW   | ✓   |    |          |
| Hit notification complete (if necessary)  |     |    | N/A      |
| Batch entered into Case Narrative.  | ✓   |    |          |
| Batch Data Exception Reports (DER) completed, if applicable.  |     |    | N/A      |
| Batch Data Exception Reports (DER) second reviewed and disposition verified to be completed.  |     |    | N/A      |
| Aliquot Correction completed if required.   |     |    | N/A      |
| Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)                  | ✓   |    |          |

GEL Laboratories, LLC

RADchecklistrev10, revised 1/13/2010

Primary Review Performed By:

JapLMF- 3/23/10

Secondary Review Performed By:

MgBdun 3/23/10

3/25

LANL

# Am/Cm Que Sheet

08-MAR-10

Batch #: 962401

Tracer(s): Am243/Cm244

LCS Isotope(s): Am241/Cm244

Spike Isotope(s): Am241/Cm244

Prep Date: 03/15/10 Initials: JCS

Analyst: JXH2

Tracer Code: 45-16-2-53

LCS Code(s):

Spike Code(s):

Balance ID: 50410272

Pipet ID: 2526038

Internal Due Date: 14-MAR-10

Expiration Date: 05/14/10

Expiration Date:

Expiration Date:

Comments:

Vol: 0.1

Vol(s):

Vol(s):

Witness: JCS

Wet/Dry

Label #

Pos.

Am/Cm

Det #

|                               |  |                |  |                   |  |                      |  |
|-------------------------------|--|----------------|--|-------------------|--|----------------------|--|
| LCS Isotope(s): Am241/Cm244   |  | LCS Code(s):   |  | Expiration Date:  |  | Vol(s):              |  |
| Spike Isotope(s): Am241/Cm244 |  | Spike Code(s): |  | Expiration Date:  |  | Vol(s):              |  |
| Prep Date: 03/15/08           |  | Initials: JAO  |  | Pipet ID: 2576087 |  | Balance ID: 50-10272 |  |
| Witness: JNO 3/15/08          |  |                |  |                   |  |                      |  |

| Sample ID    | Client Description          | Type   | Hazard Code | Min CRDL | Matrix | Client     | Collection Date | Pos. | Label # | Aliquot (g 1/1) | Am/Cm | Det # |
|--------------|-----------------------------|--------|-------------|----------|--------|------------|-----------------|------|---------|-----------------|-------|-------|
| 247964001-1  | RE36-10-8489                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 19-FEB-10       | 1    | 1       | 1.259           |       | 209   |
| 247964002-1  | RE36-10-8486                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 19-FEB-10       | 2    | 2       | 1.255           |       | 210   |
| 247964003-1  | RE36-10-8487                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 19-FEB-10       | 3    | 3       | 1.254           |       | 211   |
| 247964004-1  | RE36-10-8462                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 19-FEB-10       | 4    | 4       | 1.250           |       | 215   |
| 247964005-1  | RE36-10-8463                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 19-FEB-10       | 5    | 5       | 1.254           |       | 214   |
| 247969001-1  | RE36-10-8490                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 20-FEB-10       | 6    | 6       | 1.258           |       | 217   |
| 247969002-1  | RE36-10-8470                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 20-FEB-10       | 7    | 7       | 1.260           |       | 216   |
| 247969003-1  | RE36-10-8476                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 20-FEB-10       | 8    | 8       | 1.250           |       | 219   |
| 247969004-1  | RE36-10-8480                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 20-FEB-10       | 9    | 9       | 1.251           |       | 220   |
| 247969005-1  | RE36-10-8474                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 20-FEB-10       | 10   | 10      | 1.254           |       | 221   |
| 247969006-1  | RE36-10-8478                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 20-FEB-10       | 11   | 11      | 1.257           |       | 222   |
| 247969007-1  | RE36-10-8483                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 20-FEB-10       | 12   | 12      | 1.258           |       | 223   |
| 247969008-1  | RE36-10-8482                | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 20-FEB-10       | 13   | 13      | 1.259           |       | 224   |
| 247970001-1  | RE46-10-13181               | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 23-FEB-10       | 14   | 14      | 1.254           |       | 225   |
| 247970002-1  | RE46-10-13178               | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 23-FEB-10       | 15   | 15      | 1.256           |       | 224   |
| 247970003-1  | RE46-10-13179               | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 23-FEB-10       | 16   | 16      | 1.250           |       | 229   |
| 247970004-1  | RE46-10-13180               | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 23-FEB-10       | 17   | 17      | 1.260           |       | 230   |
| 247970005-1  | RE46-10-13177               | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 23-FEB-10       | 18   | 18      | 1.253           |       | 231   |
| 247970006-1  | RE46-10-13176               | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 23-FEB-10       | 19   | 19      | 1.259           |       | 232   |
| 247970007-1  | RE46-10-13182               | SAMPLE | .05         | pCi/g    | SOIL   | LANL010    | 23-FEB-10       | 20   | 20      | 1.260           |       | 233   |
| 1202064503-1 | MB for batch 962401         | MB     | .05         | pCi/g    | SOIL   | QC ACCOUNT |                 | 21   | 21      |                 |       | 234   |
| 1202064504-1 | RE46-10-13181(247970001DUP) | DUP    | .05         | pCi/g    | SOIL   | QC ACCOUNT | 23-FEB-10       | 22   | 22      | 1.260           |       | 235   |
| 1202064505-1 | LCS for batch 962401        | LCS    | .05         | pCi/g    | SOIL   | QC ACCOUNT |                 | 23   | 23      |                 |       | 236   |

\*SRM 0244-B exp 04/30/20 0.103g

Choose SOP Used/CL-RAD-A-011  
CL-RAD-A-036

Solid Sample Dissolution by: LEACH or DIGESTION  
Circle One

Data Reviewed By: JCS 03/23/10

# Blank Correction Report

**Batch ID 962401**

| GEL Sample ID | Client sample ID | Parameter     | Aliquot | Result    | TPU     | MDA    | Aliquot Corrected Blank Result | Units | Activity <5X Corrected Blank |
|---------------|------------------|---------------|---------|-----------|---------|--------|--------------------------------|-------|------------------------------|
| 1202064504    | DUP              | Americium-241 | 1.26 g  | 0.0027    | 0.00319 | 0.029  | -0.00047857                    | pCi/g | NO                           |
| 1202064505    | LCS              | Americium-241 | 0.103 g | 30.5      | 2.22    | 0.220  | -0.00585437                    | pCi/g | NO                           |
| 1202064503    | MB               | Americium-241 | 1.00 g  | -0.000603 | 0.00168 | 0.0246 | -0.000603                      | pCi/g | NO                           |
| 247964001     | RE36-10-8489     | Americium-241 | 1.26 g  | 0.0014    | 0.00211 | 0.0207 | -0.00047857                    | pCi/g | NO                           |
| 247964002     | RE36-10-8486     | Americium-241 | 1.26 g  | -0.00182  | 0.00148 | 0.0216 | -0.00047857                    | pCi/g | NO                           |
| 247964003     | RE36-10-8487     | Americium-241 | 1.25 g  | 0.00218   | 0.00171 | 0.0195 | -0.0004824                     | pCi/g | NO                           |
| 247964004     | RE36-10-8462     | Americium-241 | 1.25 g  | 0.0025    | 0.0019  | 0.0211 | -0.0004824                     | pCi/g | NO                           |
| 247964005     | RE36-10-8463     | Americium-241 | 1.25 g  | 0.00178   | 0.00272 | 0.0206 | -0.0004824                     | pCi/g | NO                           |
| 247969001     | RE36-10-8490     | Americium-241 | 1.26 g  | -0.000985 | 0.00212 | 0.0217 | -0.00047857                    | pCi/g | NO                           |
| 247969002     | RE36-10-8470     | Americium-241 | 1.26 g  | -0.00372  | 0.00319 | 0.0212 | -0.00047857                    | pCi/g | YES                          |
| 247969003     | RE36-10-8476     | Americium-241 | 1.25 g  | 0.00098   | 0.00141 | 0.0206 | -0.0004824                     | pCi/g | NO                           |
| 247969004     | RE36-10-8480     | Americium-241 | 1.25 g  | 0.00129   | 0.00156 | 0.0228 | -0.0004824                     | pCi/g | NO                           |
| 247969005     | RE36-10-8474     | Americium-241 | 1.25 g  | -0.00124  | 0.00338 | 0.0214 | -0.0004824                     | pCi/g | NO                           |
| 247969006     | RE36-10-8478     | Americium-241 | 1.26 g  | 0.00385   | 0.00235 | 0.0208 | -0.00047857                    | pCi/g | NO                           |
| 247969007     | RE36-10-8483     | Americium-241 | 1.26 g  | -0.00247  | 0.00212 | 0.0218 | -0.00047857                    | pCi/g | YES                          |
| 247969008     | RE36-10-8482     | Americium-241 | 1.26 g  | 0.00171   | 0.00237 | 0.0227 | -0.00047857                    | pCi/g | NO                           |
| 247970001     | RE46-10-13181    | Americium-241 | 1.25 g  | 0.00284   | 0.00257 | 0.0209 | -0.0004824                     | pCi/g | NO                           |
| 247970002     | RE46-10-13178    | Americium-241 | 1.26 g  | -0.00182  | 0.00146 | 0.0214 | -0.00047857                    | pCi/g | NO                           |
| 247970003     | RE46-10-13179    | Americium-241 | 1.25 g  | 0.000999  | 0.00142 | 0.0207 | -0.0004824                     | pCi/g | NO                           |
| 247970004     | RE46-10-13180    | Americium-241 | 1.26 g  | 0.00153   | 0.00222 | 0.0215 | -0.00047857                    | pCi/g | NO                           |
| 247970005     | RE46-10-13177    | Americium-241 | 1.25 g  | 0.00517   | 0.00303 | 0.0256 | -0.0004824                     | pCi/g | NO                           |
| 247970006     | RE46-10-13176    | Americium-241 | 1.26 g  | -0.00163  | 0.00297 | 0.0221 | -0.00047857                    | pCi/g | NO                           |
| 247970007     | RE46-10-13182    | Americium-241 | 1.26 g  | 0.00275   | 0.00205 | 0.0223 | -0.00047857                    | pCi/g | NO                           |

# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|  |   |   |
|--|---|---|
| <p>BATCH NUMBER : 962401<br/> SAMPLE ID : S0247964001_AM<br/> SAMPLE QTY : 1.259 G<br/> SAMPLE DATE : 19-FEB-2010 00:00:00<br/> ANALYST : JXH2<br/> % YIELD : 90.859</p> | <p>CHAMBER : 209<br/> DETECTOR S/N : 79188<br/> AVERAGE %EFFICIENCY : 38.7951<br/> COUNT DATE : 22-MAR-2010 11:14:25<br/> ELAPSED LIVE TIME(SEC) : 43200.00</p> | <p>LIB FILE : ENV_ALPHA_AM<br/> BKG FILE : B209.CNF;92<br/> BKG DATE : 21-MAR-2010<br/> BKG LIVE TIME(SEC) : 60000.00<br/> EFF FILE : W209.CNF;33<br/> CAL DATE : 28-FEB-2010</p> |
|--|---|---|

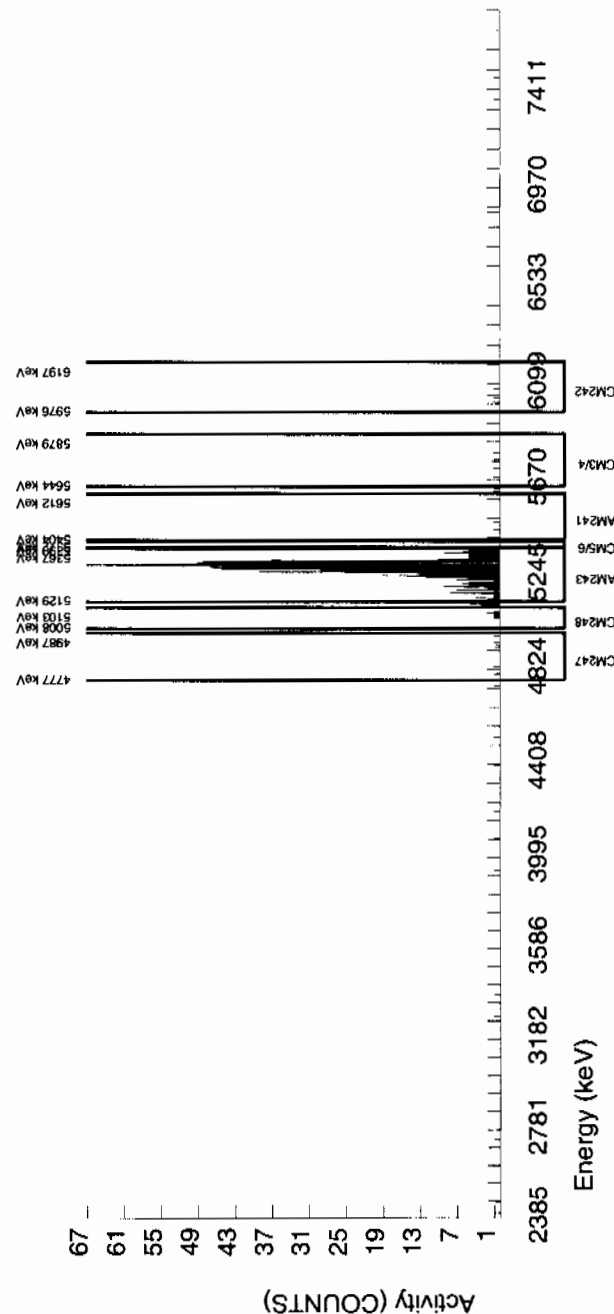
|  |  |  |
|--|--|--|
| <p>TRACER<br/> ID : 445-96-2-SS<br/> NUCLIDE : AM243<br/> NOMINAL : 2.9165E+00 dpm<br/> RESULTS : 2.6499E+00 dpm</p> | <p>MS/MSD<br/> ID : 0244-B<br/> NUCLIDE : AM-241<br/> NOMINAL : 3.3153E+01 pCi/G</p> | <p>LCS/LCSD<br/> ID : 0244-B<br/> NUCLIDE : AM-241<br/> NOMINAL : 3.3153E+01 pCi/G</p> |
|--|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|---------|----------|----------------|-------------|-----------|-----------|-----------|
| AM-241  | 5479.150       | 5519.414    | 0.000     | 3.000      | 0.995    | 0.720    | 2.7707  | 99.94000 | 1.40E-03       | 2.11E-03    | 8.43E-03  | 2.07E-02  | 2.11E-03  |
| AM243   | 5270.000       | 5281.701    | 51.725    | 740.000    | 738.560  | 1.440    | 1.2000  | 99.78000 | 1.04E+00       | 7.62E-02    | 3.66E-03  | 1.11E-02  | 3.85E-02  |
| CM-242  | 6102.000       | 6048.326    | 4.929     | 6.000      | 6.000    | 0.000    | 4.0092  | 100.0000 | 9.68E-03       | 4.00E-03    | 1.22E-02  | 2.82E-02  | 3.95E-03  |
| CM-3/4  | 5795.020       | 5752.839    | 7.239     | 7.000      | 5.560    | 1.440    | 4.8510  | 100.0000 | 7.86E-03       | 4.04E-03    | 1.48E-02  | 3.33E-02  | 4.01E-03  |
| CM-5/6  | 5386.000       | 5381.088    | 8.004     | 8.000      | 8.000    | 0.000    | 6.1294  | 86.09000 | 1.31E-02       | 4.70E-03    | 2.17E-02  | 4.77E-02  | 4.63E-03  |
| CM-247  | 4946.000       | 4907.461    | 162.655   | 6.000      | 4.560    | 1.440    | 6.3427  | 79.30000 | 8.11E-03       | 4.74E-03    | 2.43E-02  | 5.35E-02  | 4.72E-03  |
| CM-248  | 5078.600       | 5073.249    | 0.000     | 8.000      | 8.000    | 0.000    | 11.0244 | 91.00000 | 1.24E-02       | 4.45E-03    | 3.68E-02  | 7.79E-02  | 4.38E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of AM243 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
AM-241



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

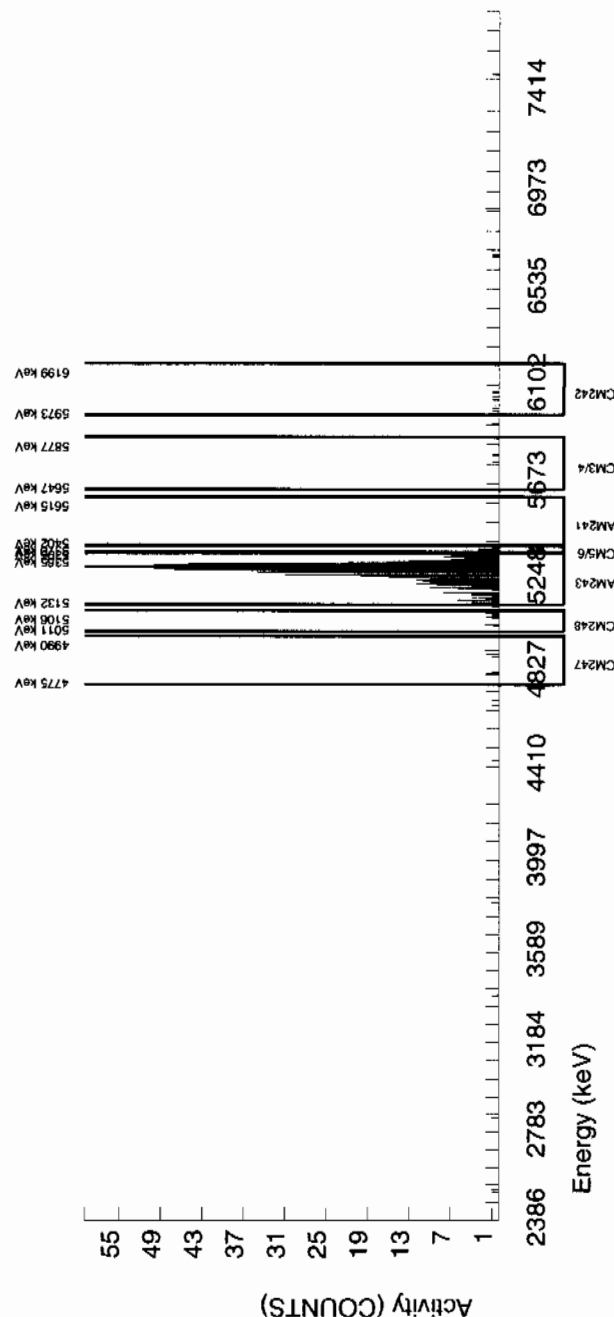
|   |  |   |  |
|---|--|---|--|
| <b>BATCH NUMBER :</b> 962401<br><b>SAMPLE ID :</b> S0247964002_AM<br><b>SAMPLE QTY :</b> 1.255 G<br><b>SAMPLE DATE :</b> 19-FEB-2010 00:00:00<br><b>ANALYST :</b> JXH2<br><b>% YIELD :</b> 85.721 |  | <b>CHAMBER :</b> 210<br><b>DETECTOR S/N :</b> 79189<br><b>AVERAGE %EFFICIENCY :</b> 39.4745<br><b>COUNT DATE :</b> 22-MAR-2010 11:14:27<br><b>ELAPSED LIVE TIME(SEC) :</b> 43200.00 | <b>LIB FILE :</b> ENV_ALPHA_AM<br><b>BKG FILE :</b> B210.CNF:91<br><b>BKG DATE :</b> 21-MAR-2010<br><b>BKG LIVE TIME(SEC) :</b> 60000.00<br><b>EFF FILE :</b> W210.CNF:31<br><b>CAL DATE :</b> 28-FEB-2010 |
|---|--|---|--|

|  |   |   |
|--|---|---|
| <b>TRACER</b><br><b>ID :</b> 445-96-2-SS<br><b>NUCLIDE :</b> AM243<br><b>NOMINAL :</b> 2.9165E+00 dpm<br><b>RESULTS :</b> 2.5001E+00 dpm | <b>MS/MSD</b><br><b>ID :</b> 0244-B<br><b>NUCLIDE :</b> AM-241<br><b>NOMINAL :</b> 3.3153E+01 pCi/G | <b>LCS/LCSD</b><br><b>ID :</b> 0244-B<br><b>NUCLIDE :</b> AM-241<br><b>NOMINAL :</b> 3.3153E+01 pCi/G |
|--|---|---|

| NUCLIDE ACTIVITY SUMMARY |                |             |           |            |          |          |         |          |                |             |
|--------------------------|----------------|-------------|-----------|------------|----------|----------|---------|----------|----------------|-------------|
| NUCLIDE                  | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA |
| AM-241                   | 5479.150       | 5508.022    | 0.000     | 0.000      | -1.234   | 0.000    | 2.7707  | 99.94000 | -1.82E-03      | 1.48E-03    |
| AM243                    | 5270.000       | 5287.245    | 52.577    | 709.000    | 709.000  | 0.000    | 0.0000  | 99.78000 | 1.05E+00       | 7.72E-02    |
| CM-242                   | 6102.000       | 6043.814    | 83.854    | 7.000      | 7.000    | 0.000    | 4.0092  | 100.0000 | 1.18E-02       | 4.52E-03    |
| CM-3/4                   | 5795.020       | 5782.234    | 0.000     | 5.000      | 5.000    | 0.000    | 4.8510  | 100.0000 | 7.39E-03       | 3.34E-03    |
| CM-5/6                   | 5386.000       | 5378.883    | 0.000     | 19.000     | 18.280   | 0.720    | 6.1294  | 86.09000 | 3.13E-02       | 7.82E-03    |
| CM-247                   | 4946.000       | 4876.969    | 103.584   | 6.000      | 5.280    | 0.720    | 6.3427  | 79.30000 | 9.81E-03       | 4.78E-03    |
| CM-248                   | 5078.600       | 5076.456    | 0.000     | 13.000     | 13.000   | 0.000    | 11.0244 | 91.00000 | 2.10E-02       | 5.99E-03    |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of AM243 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
AM-241



GEL Laboratories LLC  
ALPHA SPECTROSCOPY REPORT

|   |  |  |
|---|--|--|
| BATCH NUMBER : 962401<br>SAMPLE ID : S0247964003_AM<br>SAMPLE QTY : 1.254 G<br>SAMPLE DATE : 19-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 93.987 | CHAMBER : 211<br>DETECTOR S/N : 79190<br>AVERAGE %EFFICIENCY : 39.8764<br>COUNT DATE : 22-MAR-2010 11:14:30<br>ELAPSED LIVE TIME(SEC) : 43200.00 | LIB FILE : ENV_ALPHA_AM<br>BKG FILE : B211.CNF:91<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W211.CNF:31<br>CAL DATE : 28-FEB-2010 |
|---|--|--|

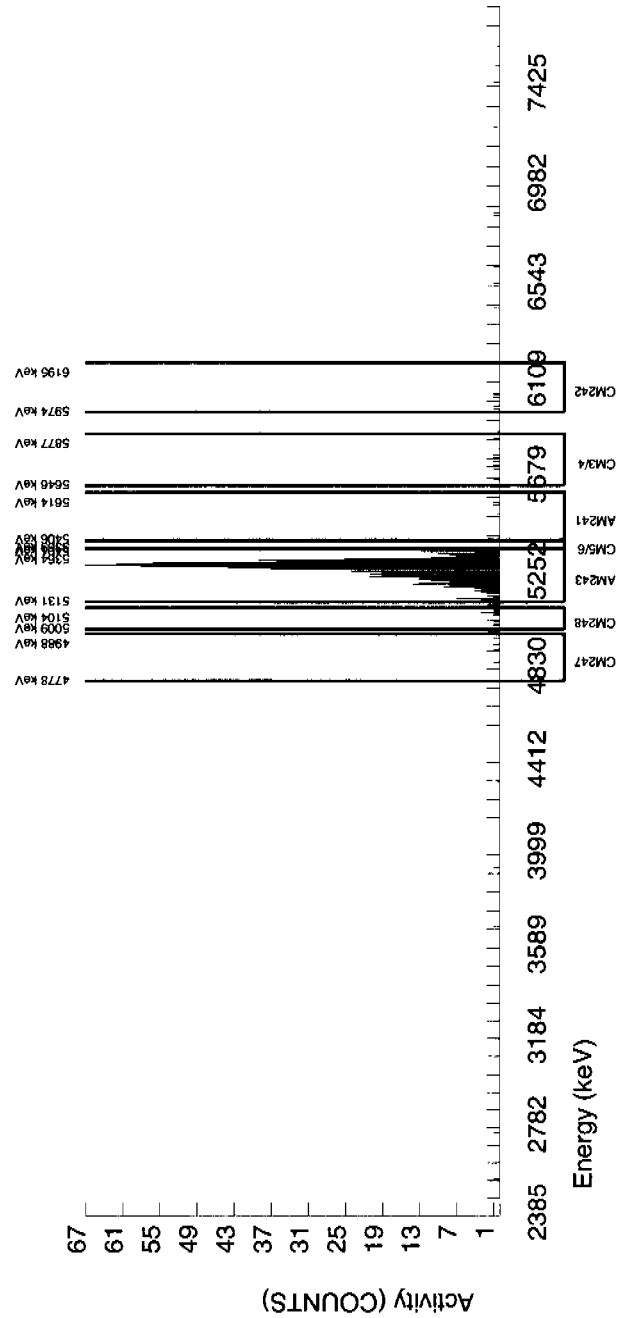
|   |   |   |
|---|---|---|
| TRACER<br>ID : 445-96-2-SS<br>NUCLIDE : AM243<br>NOMINAL : 2.9165E+00 dpm<br>RESULTS : 2.7412E+00 dpm | MS/MSD<br>ID : 0244-B<br>NUCLIDE : AM-241<br>NOMINAL : 3.3153E+01 pCi/G | LCS/LCSD<br>ID : 0244-B<br>NUCLIDE : AM-241<br>NOMINAL : 3.3153E+01 pCi/G |
|---|---|---|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|---------|----------|----------------|-------------|-----------|-----------|-----------|
| AM-241  | 5479.150       | 5555.548    | 54.303    | 3.000      | 1.634    | 0.000    | 2.7707  | 99.94000 | 2.18E-03       | 1.71E-03    | 7.96E-03  | 1.95E-02  | 1.70E-03  |
| AM243   | 5270.000       | 5282.939    | 43.857    | 786.000    | 785.280  | 0.720    | 0.8485  | 99.78000 | 1.05E+00       | 7.53E-02    | 2.44E-03  | 8.50E-03  | 3.74E-02  |
| CM-242  | 6102.000       | 6032.191    | 64.177    | 5.000      | 5.000    | 0.000    | 4.0092  | 100.0000 | 7.62E-03       | 3.44E-03    | 1.15E-02  | 2.66E-02  | 3.41E-03  |
| CM-3/4  | 5795.020       | 5755.910    | 7.251     | 9.000      | 8.280    | 0.720    | 4.8510  | 100.0000 | 1.11E-02       | 4.18E-03    | 1.39E-02  | 3.15E-02  | 4.12E-03  |
| CM-5/6  | 5386.000       | 5373.079    | 0.000     | 8.000      | 8.000    | 0.000    | 6.1294  | 86.09000 | 1.24E-02       | 4.44E-03    | 2.04E-02  | 4.51E-02  | 4.37E-03  |
| CM-247  | 4946.000       | 4925.900    | 103.670   | 5.000      | 5.000    | 0.000    | 6.3427  | 79.30000 | 8.39E-03       | 3.79E-03    | 2.30E-02  | 5.05E-02  | 3.75E-03  |
| CM-248  | 5078.600       | 5071.288    | 35.791    | 14.000     | 14.000   | 0.000    | 11.0244 | 91.00000 | 2.05E-02       | 5.62E-03    | 3.48E-02  | 7.35E-02  | 5.47E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of AM243 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
AM-241



**GEL Laboratories LLC**  
**ALPHA SPECTROSCOPY REPORT**

BATCH NUMBER : 962401  
SAMPLE ID : S0247964004\_AM  
SAMPLE QTY : 1.250 G  
SAMPLE DATE : 19-FEB-2010 00:00:00  
ANALYST : JXH2  
% YIELD : 90.808

CHAMBER : 215  
DETECTOR S/N : 79468  
AVERAGE %EFFICIENCY : 38.2619  
COUNT DATE : 22-MAR-2010 03:05:28  
ELAPSED LIVE TIME(SEC) : 43200.00

```
LIB FILE      : ENV_ALPHA_AM
BKG FILE     : B215.CNF;91
BKG DATE     : 21-MAR-2010
BKG LIVE TIME(SEC) : 60000.00
EFF FILE     : W215.CNF;35
CAL DATE     : 28-FEB-2010
```

## TRACER

ID : 445-96-2-SS  
NUCLIDE : AM243  
NOMINAL : 2.9166E+00 dpm  
RESULTS : 2.6485E+00 dpm

## MS/MSD

ID : 0244-B  
NUCLIDE : AM-241  
NOMINAL : 3.3153E+01 pCi/G

## LCS/LCSD

|         |         |                    |
|---------|---------|--------------------|
| LOG/LOC | ID      | : 0244-B           |
|         | NUCLIDE | : AM-241           |
|         | NOMINAL | : 3.3153E+01 pCi/G |

## NUCLIDE ACTIVITY SUMMARY

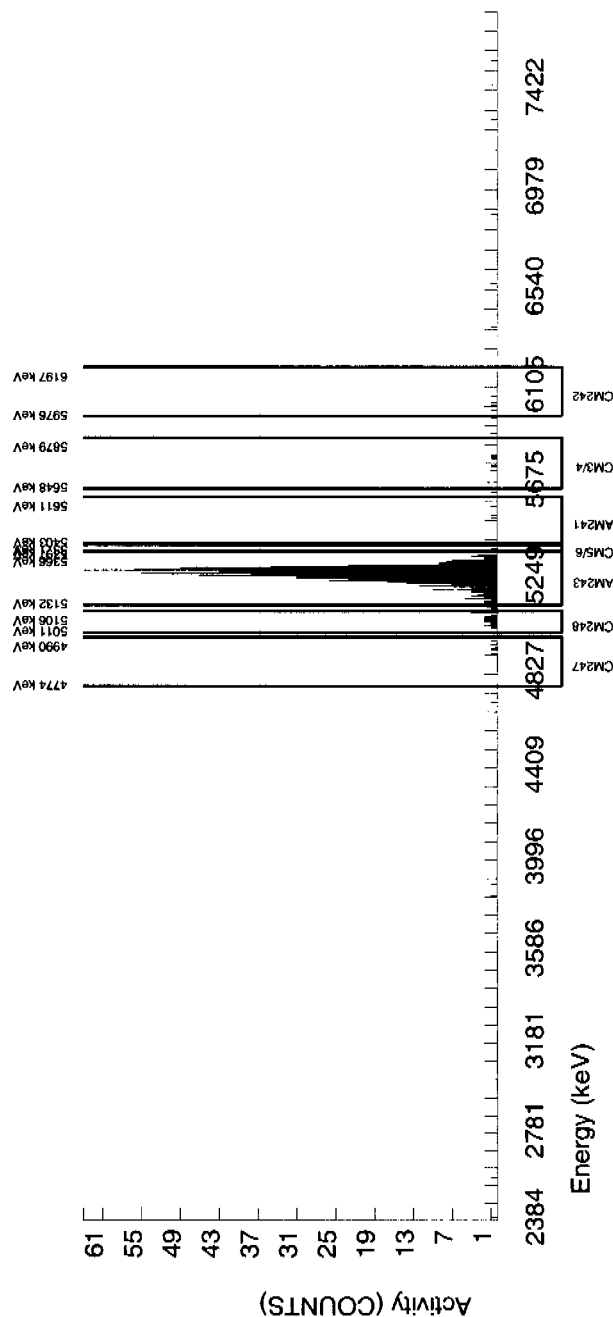
| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|---------|----------|----------------|-------------|-----------|-----------|-----------|
| AM-241  | 5479.150       | 5543.149    | 54.221    | 3.000      | 1.733    | 0.000    | 2.7707  | 99.94000 | 2.50E-03       | 1.90E-03    | 8.62E-03  | 2.11E-02  | 1.90E-03  |
| AM-243  | 5270.000       | 5271.659    | 44.964    | 728.000    | 728.000  | 0.000    | 0.0000  | 99.78000 | 1.05E+00       | 7.69E-02    | 0.00E+00  | 3.91E-03  | 3.90E-02  |
| CM-242  | 6102.000       | 6037.939    | 64.079    | 4.000      | 4.000    | 0.000    | 4.0092  | 100.0000 | 6.58E-03       | 3.32E-03    | 1.25E-02  | 2.88E-02  | 3.29E-03  |
| CM-3/4  | 5795.020       | 5774.568    | 69.008    | 7.000      | 7.000    | 0.000    | 4.8510  | 100.0000 | 1.01E-02       | 3.88E-03    | 1.51E-02  | 3.41E-02  | 3.82E-03  |
| CM-5/6  | 5386.000       | 5376.221    | 0.000     | 5.000      | 5.000    | 0.000    | 6.1294  | 86.09000 | 8.37E-03       | 3.78E-03    | 2.21E-02  | 4.88E-02  | 3.74E-03  |
| CM-247  | 4946.000       | 4950.720    | 0.000     | 7.000      | 6.280    | 0.720    | 6.3427  | 79.30000 | 1.14E-02       | 5.03E-03    | 2.49E-02  | 5.46E-02  | 4.98E-03  |
| CM-248  | 5078.600       | 5076.255    | 0.000     | 26.000     | 26.000   | 0.000    | 11.0244 | 91.00000 | 4.12E-02       | 8.48E-03    | 3.76E-02  | 7.96E-02  | 8.07E-03  |

## NOTES:

\* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)

\* BKG Sg of AM243 calculated as sqrt(BKG AREA).

\* Corrections made to the following net area due to tracer impurity:  
AM-24<sup>1</sup>





**GEL Laboratories LLC**  
**ALPHA SPECTROSCOPY REPORT**

|              |               |
|--------------|---------------|
| BATCH NUMBER | : 962401      |
| SAMPLE ID    | : S024799     |
| SAMPLE QTY   | : 1.25        |
| SAMPLE DATE  | : 19-FEB-2019 |
| ANALYST      | : JXH2        |
| % YIELD      | : 91.809      |

CHAMBER : 216  
DETECTOR S/N : 79195  
AVERAGE %EFFICIENCY : 38.6826  
COUNT DATE : 22-MAR-2010 03:05:30  
ELAPSED LIVE TIME(SEC) : 43200.00

```
LIB FILE      : ENV_ALPHA_AM
BKG FILE     : B216.CNF;91
BKG DATE     : 21-MAR-2010
BKG LIVE TIME(SEC) : 60000.00
EFF FILE     : W216.CNF;30
CAL DATE     : 28-FEB-2010
```

|         |   |                |
|---------|---|----------------|
| TRACER  | : | 445-96-2-SS    |
| ID      | : | AM243          |
| NUCLIDE | : | 2.9166E+00 dpm |
| NOMINAL | : | 2.6777E+00 dpm |
| RESULTS | : |                |

MS/MSD  
ID : 0244-B  
NUCLIDE : AM-241  
NOMINAL : 3.3153E+01 pCi/G

|           |                  |
|-----------|------------------|
| LCS/LCSD  |                  |
| ID :      | 0244-B           |
| NUCLIDE : | AM-241           |
| NOMINAL : | 3.3153E+01 pCi/G |

## NUCLIDE ACTIVITY SUMMARY

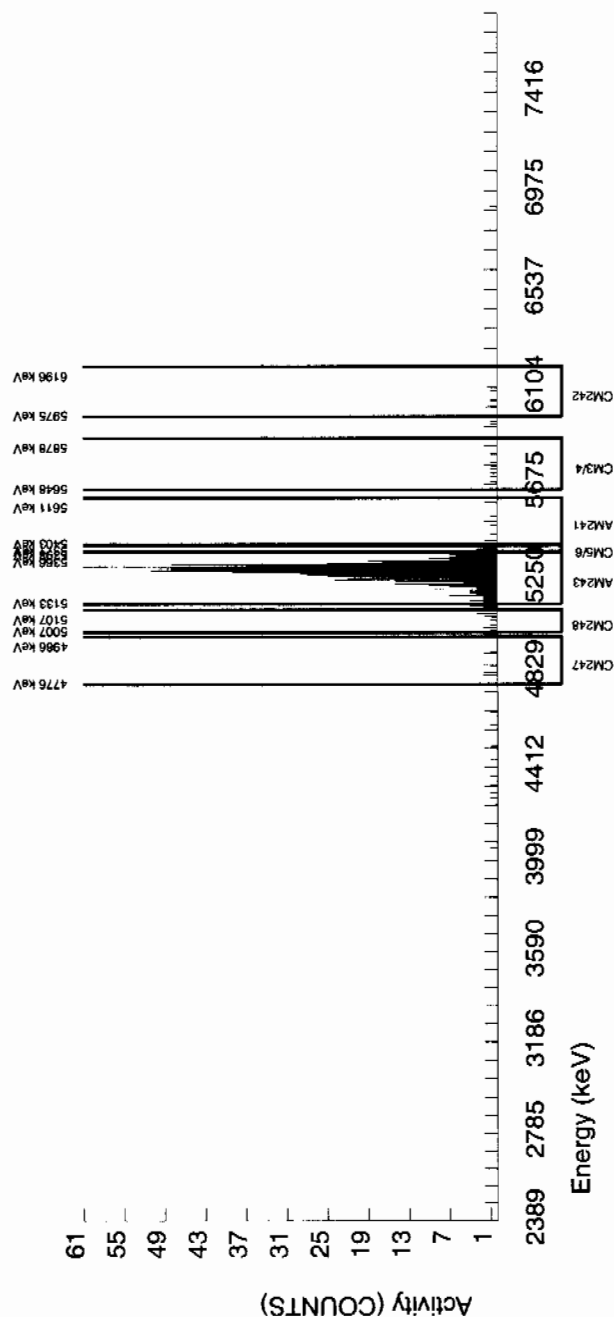
| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|---------|----------|----------------|-------------|-----------|-----------|-----------|
| AM-241  | 5479.150       | 5472.284    | 0.000     | 4.000      | 1.265    | 1.440    | 2.7707  | 99.94000 | 1.78E-03       | 2.72E-03    | 8.40E-03  | 2.06E-02  | 2.72E-03  |
| AM243   | 5270.000       | 5283.480    | 42.294    | 747.000    | 744.120  | 2.880    | 1.6971  | 99.78000 | 1.05E+00       | 7.64E-02    | 5.15E-03  | 1.41E-02  | 3.85E-02  |
| CM-242  | 6102.000       | 6030.110    | 4.929     | 7.000      | 6.280    | 0.720    | 4.0092  | 100.0000 | 1.01E-02       | 4.45E-03    | 1.22E-02  | 2.81E-02  | 4.40E-03  |
| CM-3/4  | 5795.020       | 5747.268    | 118.285   | 7.000      | 7.000    | 0.000    | 4.8510  | 100.0000 | 9.87E-03       | 3.78E-03    | 1.47E-02  | 3.32E-02  | 3.73E-03  |
| CM-5/6  | 5386.000       | 5384.134    | 0.000     | 10.000     | 10.000   | 0.000    | 6.1294  | 86.09000 | 1.63E-02       | 5.26E-03    | 2.16E-02  | 4.76E-02  | 5.16E-03  |
| CM-247  | 4946.000       | 4884.245    | 49.285    | 8.000      | 8.000    | 0.000    | 6.3427  | 79.30000 | 1.42E-02       | 5.09E-03    | 2.42E-02  | 5.33E-02  | 5.01E-03  |
| CM-248  | 5078.600       | 5063.134    | 62.839    | 9.000      | 7.560    | 1.440    | 11.0244 | 91.00000 | 1.17E-02       | 4.95E-03    | 3.67E-02  | 7.76E-02  | 4.89E-03  |

## NOTES:

\* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)

\* BKG Sg of AM243 calculated as  $\sqrt{\text{BKG AREA}}$ .

\* Corrections made to the following net area due to tracer impurity:  
AM-241



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|   |  |  |  |
|---|--|--|--|
| BATCH NUMBER : 962401<br>SAMPLE ID : S0247970001_AM<br>SAMPLE QTY : 1.254 G<br>SAMPLE DATE : 23-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 90.477 |  | CHAMBER : 225<br>DETECTOR S/N : 79418<br>AVERAGE %EFFICIENCY : 38.8004<br>COUNT DATE : 22-MAR-2010 03:05:59<br>ELAPSED LIVE TIME(SEC) : 43200.00 | LIB FILE : ENV_ALPHA_AM<br>BKG FILE : B225.CNF.91<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W225.CNF.30<br>CAL DATE : 28-FEB-2010 |
|---|--|--|--|

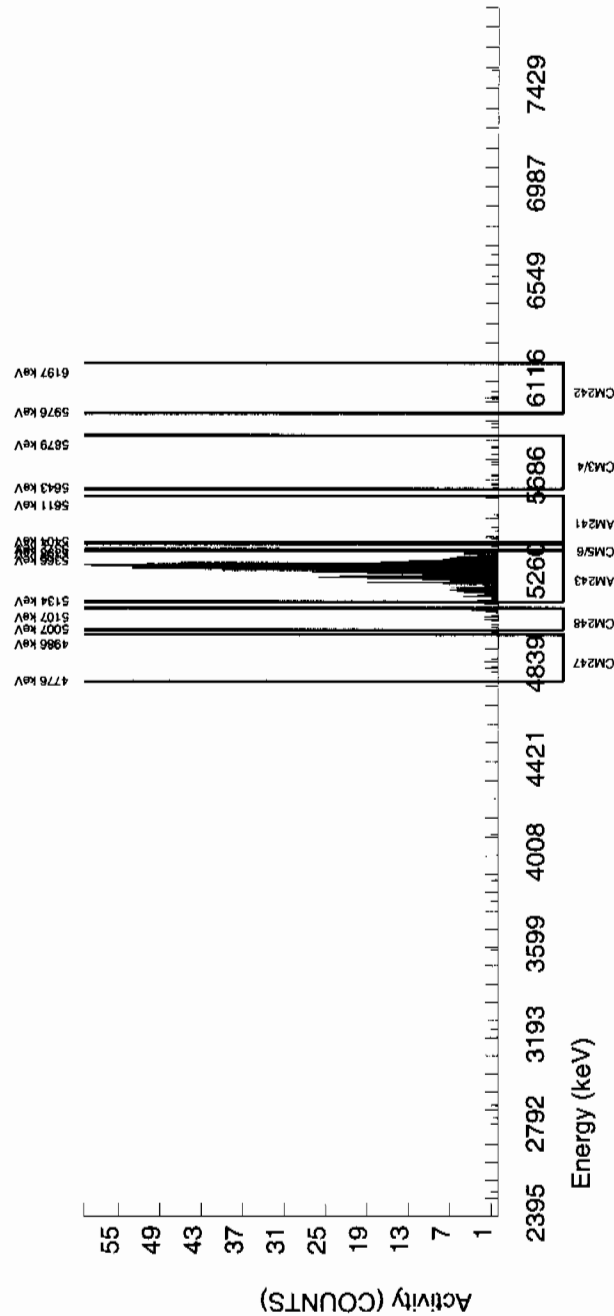
|  |  |  |
|--|--|--|
| TRACER<br>ID : 445-96-2-SS<br>NUCLEIDE : AM243<br>NOMINAL : 2.9165E+00 dpm<br>RESULTS : 2.6388E+00 dpm | MS/MSD<br>ID : 0244-B<br>NUCLEIDE : AM-241<br>NOMINAL : 3.3152E+01 pCi/G | LCS/LCSD<br>ID : 0244-B<br>NUCLEIDE : AM-241<br>NOMINAL : 3.3152E+01 pCi/G |
|--|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|---------|----------|----------------|-------------|-----------|-----------|-----------|
| AM-241  | 5479.150       | 5474.013    | 103.723   | 4.000      | 2.000    | 0.720    | 2.7707  | 99.94000 | 2.84E-03       | 2.57E-03    | 8.50E-03  | 2.09E-02  | 2.56E-03  |
| AM243   | 5270.000       | 5281.089    | 40.194    | 737.000    | 735.560  | 1.440    | 1.2000  | 99.78000 | 1.05E+00       | 7.65E-02    | 3.69E-03  | 1.12E-02  | 3.87E-02  |
| CM-242  | 6102.000       | 6052.722    | 9.878     | 6.000      | 6.000    | 0.000    | 4.0092  | 100.0000 | 9.58E-03       | 3.96E-03    | 1.23E-02  | 2.84E-02  | 3.91E-03  |
| CM-3/4  | 5795.020       | 5752.315    | 162.376   | 10.000     | 9.280    | 0.720    | 4.8510  | 100.0000 | 1.32E-02       | 4.70E-03    | 1.49E-02  | 3.36E-02  | 4.62E-03  |
| CM-5/6  | 5386.000       | 5376.438    | 0.000     | 9.000      | 9.000    | 0.000    | 6.1294  | 86.09000 | 1.49E-02       | 5.04E-03    | 2.18E-02  | 4.81E-02  | 4.95E-03  |
| CM-247  | 4946.000       | 4859.838    | 4.939     | 5.000      | 5.000    | 0.000    | 6.3427  | 79.30000 | 8.96E-03       | 4.05E-03    | 2.45E-02  | 5.39E-02  | 4.01E-03  |
| CM-248  | 5078.600       | 5071.849    | 5.737     | 16.000     | 16.000   | 0.000    | 11.0244 | 91.00000 | 2.50E-02       | 6.44E-03    | 3.71E-02  | 7.85E-02  | 6.25E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of AM243 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
AM-241



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|   |   |  |
|---|---|--|
| <p>BATCH NUMBER : 962401<br/>SAMPLE ID : S1202064503_AM<br/>SAMPLE QTY : 1.000 G<br/>SAMPLE DATE : 15-MAR-2010 00:00:00<br/>ANALYST : JXH2<br/>% YIELD : 93.799</p> | <p>CHAMBER : 234<br/>DETECTOR S/N : 79427<br/>AVERAGE %EFFICIENCY : 39.7384<br/>COUNT DATE : 22-MAR-2010 03:06:21<br/>ELAPSED LIVE TIME(SEC) : 43200.00</p> | <p>LIB FILE : ENV_ALPHA_AM<br/>BKG FILE : B234.CNF:92<br/>BKG DATE : 21-MAR-2010<br/>BKG LIVE TIME(SEC) : 60000.00<br/>EFF FILE : W234.CNF:30<br/>CAL DATE : 28-FEB-2010</p> |
|---|---|--|

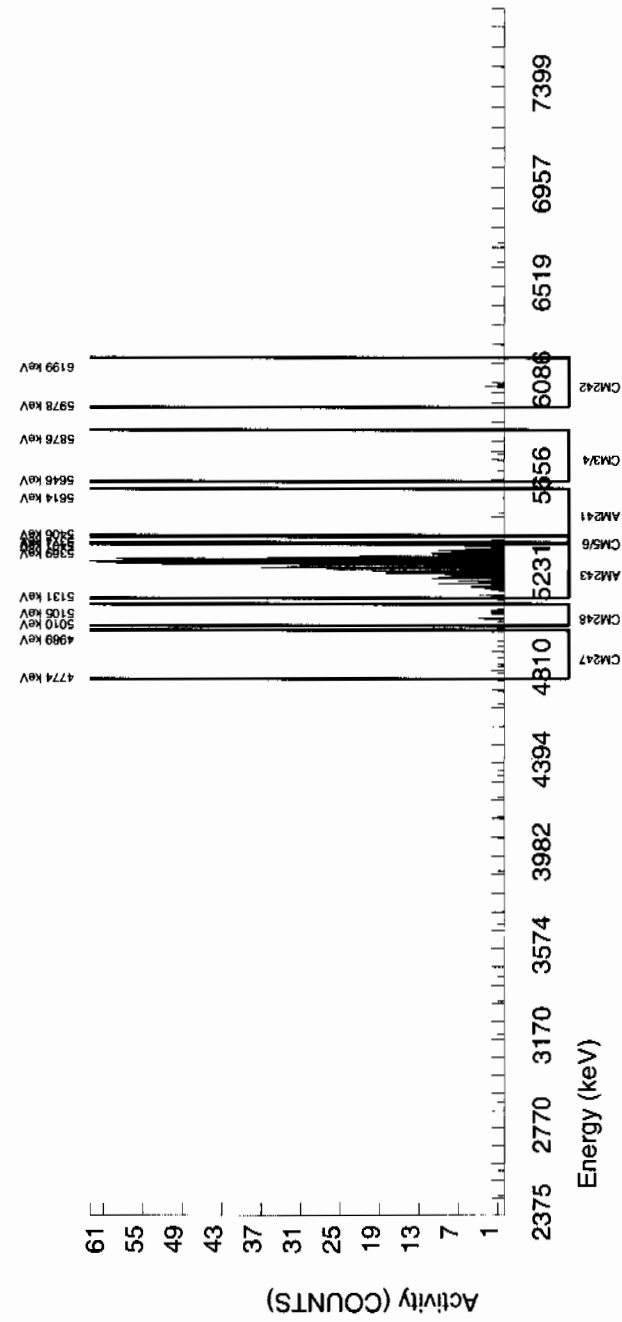
|  |   |   |
|--|---|---|
| <p>TRACER<br/>ID : 445-96-2-SS<br/>NUCLIDE : AM243<br/>NOMINAL : 2.9165E+00 dpm<br/>RESULTS : 2.7357E+00 dpm</p> | <p>MS/MSD<br/>ID : 0244-B<br/>NUCLIDE : AM-241<br/>NOMINAL : 3.3149E+01 pCi/G</p> | <p>LCS/LCSD<br/>ID : 0244-B<br/>NUCLIDE : AM-241<br/>NOMINAL : 3.3149E+01 pCi/G</p> |
|--|---|---|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|---------|----------|----------------|-------------|-----------|-----------|-----------|
| AM-241  | 5478.150       | 5512.361    | 4.914     | 1.000      | -0.359   | 0.000    | 2.7707  | 99.94000 | -6.03E-04      | 1.68E-03    | 1.00E-02  | 2.46E-02  | 1.68E-03  |
| AM243   | 5270.000       | 5283.005    | 48.367    | 781.000    | 781.000  | 0.000    | 0.0000  | 99.78000 | 1.31E+00       | 9.46E-02    | 0.00E+00  | 4.56E-03  | 4.70E-02  |
| CM-242  | 6102.000       | 6069.386    | 29.484    | 8.000      | 8.000    | 0.000    | 4.0092  | 100.0000 | 1.39E-02       | 4.97E-03    | 1.45E-02  | 3.36E-02  | 4.90E-03  |
| CM-3/4  | 5795.020       | 5776.589    | 4.914     | 6.000      | 5.280    | 0.720    | 4.8510  | 100.0000 | 8.87E-03       | 4.32E-03    | 1.76E-02  | 3.97E-02  | 4.29E-03  |
| CM-5/6  | 5386.000       | 5379.532    | 0.000     | 11.000     | 11.000   | 0.000    | 6.1294  | 86.09000 | 2.14E-02       | 6.60E-03    | 2.58E-02  | 5.68E-02  | 6.47E-03  |
| CM-247  | 4946.000       | 4862.838    | 162.161   | 8.000      | 6.560    | 1.440    | 6.3427  | 79.30000 | 1.39E-02       | 6.42E-03    | 2.90E-02  | 6.37E-02  | 6.36E-03  |
| CM-248  | 5078.600       | 5056.114    | 8.686     | 20.000     | 20.000   | 0.000    | 11.0244 | 91.00000 | 3.69E-02       | 8.56E-03    | 4.39E-02  | 9.27E-02  | 8.25E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of AM243 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
AM-241



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|   |  |   |  |
|---|--|---|--|
| <b>BATCH NUMBER :</b> 962401<br><b>SAMPLE ID :</b> S1202064504_AM<br><b>SAMPLE QTY :</b> 1.260 G<br><b>SAMPLE DATE :</b> 23-FEB-2010 00:00:00<br><b>ANALYST :</b> JXH2<br><b>% YIELD :</b> 63.192 |  | <b>CHAMBER :</b> 235<br><b>DETECTOR S/N :</b> 79428<br><b>AVERAGE %EFFICIENCY :</b> 39.7692<br><b>COUNT DATE :</b> 22-MAR-2010 03:06:26<br><b>ELAPSED LIVE TIME(SEC) :</b> 43200.00 | <b>LIB FILE :</b> ENV_ALPHA_AM<br><b>BKG FILE :</b> B235.CNF:91<br><b>BKG DATE :</b> 21-MAR-2010<br><b>BKG LIVE TIME(SEC) :</b> 60000.00<br><b>EFF FILE :</b> W235.CNF:30<br><b>CAL DATE :</b> 28-FEB-2010 |
|---|--|---|--|

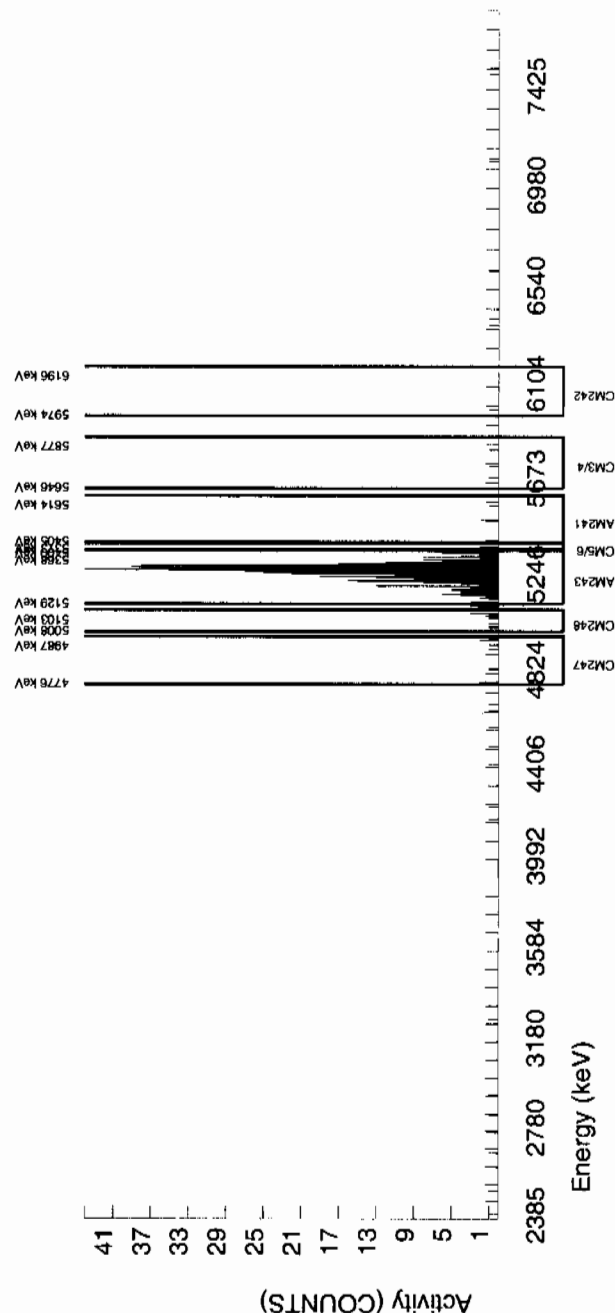
|  |   |   |
|--|---|---|
| <b>TRACER ID :</b> 445-96-2-SS<br><b>NUCLIDE :</b> AM243<br><b>NOMINAL :</b> 2.9165E+00 dpm<br><b>RESULTS :</b> 1.8430E+00 dpm | <b>MS/MSD ID :</b> 0244-B<br><b>NUCLIDE :</b> AM-241<br><b>NOMINAL :</b> 3.3152E+01 pCi/G | <b>LCS/LCSD ID :</b> 0244-B<br><b>NUCLIDE :</b> AM-241<br><b>NOMINAL :</b> 3.3152E+01 pCi/G |
|--|---|---|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|---------|----------|----------------|-------------|-----------|-----------|-----------|
| AM-241  | 5479.150       | 5531.604    | 4.911     | 3.000      | 1.364    | 0.720    | 2.7707  | 99.94000 | 2.70E-03       | 3.19E-03    | 1.18E-02  | 2.90E-02  | 3.19E-03  |
| AM-243  | 5270.000       | 5276.923    | 42.961    | 528.000    | 526.560  | 1.440    | 1.2000  | 99.78000 | 1.04E+00       | 8.36E-02    | 5.13E-03  | 1.56E-02  | 4.55E-02  |
| CM-242  | 6102.000       | 6014.570    | 19.645    | 2.000      | 2.000    | 0.000    | 4.0092  | 100.0000 | 4.44E-03       | 3.15E-03    | 1.71E-02  | 3.95E-02  | 3.14E-03  |
| CM-3/4  | 5795.020       | 5788.059    | 0.000     | 4.000      | -0.320   | 4.320    | 4.8510  | 100.0000 | -6.34E-04      | 5.29E-03    | 2.07E-02  | 4.67E-02  | 5.28E-03  |
| CM-5/6  | 5386.000       | 5378.017    | 0.000     | 8.000      | 8.000    | 0.000    | 6.1294  | 86.09000 | 1.84E-02       | 6.61E-03    | 3.03E-02  | 6.69E-02  | 6.49E-03  |
| CM-247  | 4946.000       | 4894.217    | 181.507   | 11.000     | 11.000   | 0.000    | 6.3427  | 79.30000 | 2.74E-02       | 8.47E-03    | 3.41E-02  | 7.49E-02  | 8.26E-03  |
| CM-248  | 5078.600       | 5057.850    | 72.388    | 14.000     | 14.000   | 0.000    | 11.0244 | 91.00000 | 3.04E-02       | 8.38E-03    | 5.16E-02  | 1.09E-01  | 8.12E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of AM243 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
AM-241



GEL Laboratories LLC  
ALPHA SPECTROSCOPY REPORT

|   |  |  |
|---|--|--|
| BATCH NUMBER : 962401<br>SAMPLE ID : S1202064505_AM<br>SAMPLE QTY : 0.103 G<br>SAMPLE DATE : 15-MAR-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 97.882 | CHAMBER : 236<br>DETECTOR S/N : 79429<br>AVERAGE %EFFICIENCY : 41.3400<br>COUNT DATE : 22-MAR-2010 03:06:28<br>ELAPSED LIVE TIME(SEC) : 43200.00 | LIB FILE : ENV_ALPHA_AM<br>BKG FILE : B236.CNF:91<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W236.CNF:30<br>CAL DATE : 28-FEB-2010 |
|---|--|--|

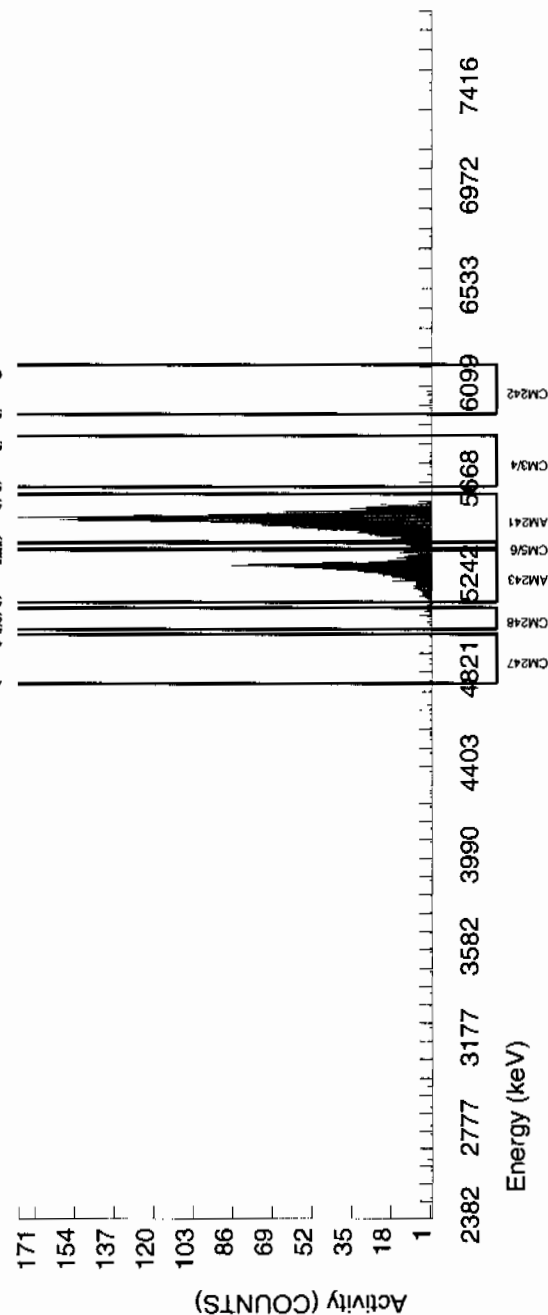
|   |   |   |
|---|---|---|
| TRACER<br>ID : 445-96-2-SS<br>NUCLIDE : AM243<br>NOMINAL : 2.9165E+00 dpm<br>RESULTS : 2.8547E+00 dpm | MS/MSD<br>ID : 0244-B<br>NUCLIDE : AM-241<br>NOMINAL : 3.3149E+01 pCi/G | LCS/LCSD<br>ID : 0244-B<br>NUCLIDE : AM-241<br>NOMINAL : 3.3149E+01 pCi/G |
|---|---|---|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg  | %ABUN     | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|---------|-----------|----------------|-------------|-----------|-----------|-----------|
| AM-241  | 5479.150       | 5501.644    | 38.180    | 2034.000   | 2032.525 | 0.000    | 2.7707  | 99.94000  | 3.05E+01       | 2.22E+00    | 8.98E-02  | 2.20E-01  | 6.77E-01  |
| AM243   | 5270.000       | 5282.669    | 28.696    | 850.000    | 847.840  | 2.160    | 1.4697  | 99.78000  | 1.28E+01       | 9.85E-01    | 4.77E-02  | 1.36E-01  | 4.39E-01  |
| CM-242  | 6102.000       | 6052.023    | 19.672    | 8.000      | 8.000    | 0.000    | 4.0092  | 100.00000 | 1.24E-01       | 4.46E-02    | 1.30E-01  | 3.00E-01  | 4.38E-02  |
| CM-3/4  | 5795.020       | 5748.092    | 4.918     | 10.000     | 6.400    | 3.600    | 4.8510  | 100.00000 | 9.61E-02       | 5.37E-02    | 1.57E-01  | 3.55E-01  | 5.33E-02  |
| CM-5/6  | 5386.000       | 5385.199    | 0.000     | 47.000     | 47.000   | 0.000    | 6.1294  | 86.09000  | 8.20E-01       | 1.32E-01    | 2.31E-01  | 5.08E-01  | 1.20E-01  |
| CM-247  | 4946.000       | 4877.526    | 0.000     | 7.000      | 4.840    | 2.160    | 6.3427  | 79.30000  | 9.16E-02       | 5.57E-02    | 2.59E-01  | 5.69E-01  | 5.54E-02  |
| CM-248  | 5078.600       | 5077.441    | 0.000     | 18.000     | 18.000   | 0.000    | 11.0244 | 91.00000  | 2.97E-01       | 7.29E-02    | 3.92E-01  | 8.29E-01  | 7.00E-02  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of AM243 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
AM-241



# Radiochemistry Batch Checklist, Rev10

Batch# 962402

Product: Pu

Date: 3/23/10

| Criteria:   | Yes | No | Comments       |
|---|-----|----|----------------|
| Sample Solids are less than or equal to 100 mg for GAB.   |     |    | N/A            |
| Samples have been blank corrected (if required)   | ✓   |    |                |
| If activity less 10" MDA/ MDC, error is 150% or less of sample activity. If greater 10" MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay. | ✓   |    |                |
| Instrument source check is within limits.   | ✓   |    |                |
| Instrument bkg check is within limits.  | ✓   |    |                |
| Method RDL/ LLD has been met.   | ✓   |    |                |
| If duplicate activities are less 5" MDA/ MDC, then RPD is 100% or less. If greater 5" MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.   | ✓   |    |                |
| Or meets the client's required RER acceptance criteria.   | ✓   |    |                |
| Tracer yield is 15-125% . Carrier yield 25-125%.  | ✓   |    |                |
| Or meets the client's contract acceptance criteria.   | ✓   |    |                |
| Method blank is less than the RDL/ LLD.   | ✓   |    | Case narrative |
| (If rad samples, < 5% of lowest activity)   | ✓   |    |                |
| Sample was run within hold time.  | ✓   |    |                |
| Sample was correctly preserved if required.   | ✓   |    |                |
| Smears Taken for Radioactive batches.   |     |    | N/A            |
| Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.   | ✓   |    |                |
| No blank spaces on data forms.  | ✓   |    |                |
| All line outs Initialed and dated.  | ✓   |    |                |
| No transcription errors are apparent.   | ✓   |    |                |
| Aux data is correct.  |     |    | N/A            |
| Client Special requirements page has been checked.  | ✓   |    |                |
| Raw Data and/ or spectrum are included and properly statused.   | ✓   |    |                |
| QC data entered into QC database and batch is in REVW   | ✓   |    |                |
| Hit notification complete (if necessary)  |     |    | N/A            |
| Batch entered into Case Narrative.  | ✓   |    |                |
| Batch Data Exception Reports (DER) completed, if applicable.  |     |    | N/A            |
| Batch Data Exception Reports (DER) second reviewed and disposition verified to be completed.  |     |    | N/A            |
| Aliquot Correction completed if required.   |     |    | N/A            |
| Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)                  | ✓   |    |                |

GEL Laboratories, LLC

RADchecklistrev10, revised 1/13/2010

Primary Review Performed By: [Signature] 3/23/10

Secondary Review Performed By: [Signature] 3/23/10

LANL

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# Plutonium Que Sheet

08-MAR-10

Batch #: 962402

Analyst: JXH2

First Client Due Date: 25-MAR-10

Internal Due Date: 14-MAR-10

Tracer Isotope(s): Pu-239

Expiration Date: 3-4-11

Vol: 0.1

LCS Isotope(s): Pu-239

Expiration Date:

Vol:

Spike Isotope(s): Pu-239

Expiration Date:

Vol:

Prep Date: 03/15/10 Initials: JXH2 Pipet ID: 221058 Balance ID: 5040272

Witness: JXH2

| Sample ID    | Client Description          | Type   | Hazard Code | Min CRDL  | Matrix | Client     | Collection Date | Pos. | Label # | Wet/Dry | Aliquot (g/1/1) | Pu Det # |
|--------------|-----------------------------|--------|-------------|-----------|--------|------------|-----------------|------|---------|---------|-----------------|----------|
| 247964001-1  | RE36-10-4489                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 19-FEB-10       | 1    | 1       | 1.259   |                 | 13       |
| 247964002-1  | RE36-10-4486                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 19-FEB-10       | 2    | 2       | 1.255   |                 | 14       |
| 247964003-1  | RE36-10-4487                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 19-FEB-10       | 3    | 3       | 1.254   |                 | 16       |
| 247964004-1  | RE36-10-4462                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 19-FEB-10       | 4    | 4       | 1.250   |                 | 17       |
| 247964005-1  | RE36-10-4463                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 19-FEB-10       | 5    | 5       | 1.254   |                 | 18       |
| 247969001-1  | RE36-10-4490                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 20-FEB-10       | 6    | 6       | 1.258   |                 | 83       |
| 247969002-1  | RE36-10-4470                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 20-FEB-10       | 7    | 7       | 1.260   |                 | 84       |
| 247969003-1  | RE36-10-4476                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 20-FEB-10       | 8    | 8       | 1.250   |                 | 85       |
| 247969004-1  | RE36-10-4480                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 20-FEB-10       | 9    | 9       | 1.251   |                 | 86       |
| 247969005-1  | RE36-10-4474                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 20-FEB-10       | 10   | 10      | 1.254   |                 | 87       |
| 247969006-1  | RE36-10-4478                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 20-FEB-10       | 11   | 11      | 1.257   |                 | 88       |
| 247969007-1  | RE36-10-4483                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 20-FEB-10       | 12   | 12      | 1.258   |                 | 89       |
| 247969008-1  | RE36-10-4482                | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 20-FEB-10       | 13   | 13      | 1.259   |                 | 90       |
| 247970001-1  | RE46-10-13181               | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 23-FEB-10       | 14   | 14      | 1.254   |                 | 91       |
| 247970002-1  | RE46-10-13178               | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 23-FEB-10       | 15   | 15      | 1.256   |                 | 93       |
| 247970003-1  | RE46-10-13179               | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 23-FEB-10       | 16   | 16      | 1.250   |                 | 94       |
| 247970004-1  | RE46-10-13180               | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 23-FEB-10       | 17   | 17      | 1.260   |                 | 95       |
| 247970005-1  | RE46-10-13177               | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 23-FEB-10       | 18   | 18      | 1.253   |                 | 96       |
| 247970006-1  | RE46-10-13176               | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 23-FEB-10       | 19   | 19      | 1.259   |                 | 97       |
| 247970007-1  | RE46-10-13182               | SAMPLE |             | .05 pCi/g | SOIL   | LANL010    | 23-FEB-10       | 20   | 20      | 1.260   |                 | 98       |
| 1202064506-1 | MB for batch 962402         | MB     |             | .05 pCi/g | SOIL   | QC ACCOUNT |                 | 21   | 21      | 1.0     |                 | 99       |
| 1202064507-1 | RE46-10-13181(247970001DUP) | DUP    |             | .05 pCi/g | SOIL   | QC ACCOUNT |                 | 22   | 22      | 1.260   |                 | 100      |
| 1202064508-1 | LCS for batch 962402        | LCS    |             | .05 pCi/g | SOIL   | QC ACCOUNT |                 | 23   | 23      | 0.103   |                 | 112      |

Choose SOP Used: GL-RAD-A-011, GL-RAD-A-036, GL-RAD-A-045, GL-RAD-A-043

\* SRM 0244-B exp 04/30/20 0.103g

Solid Sample Dissolution by: LEACH or DIGESTION Circle One

Data Reviewed By: JXH2 3/23/10

GEL Laboratories LLC, Radiochemistry Division

Page: 1 of 1

# Blank Correction Report

**Batch ID 962402**

| GEL Sample ID | Client sample ID | Parameter         | Aliquot | Result    | TPU     | MDA    | Aliquot Corrected Blank Result | Units | Activity <5X Corrected Blank |
|---------------|------------------|-------------------|---------|-----------|---------|--------|--------------------------------|-------|------------------------------|
| 1202064507    | DUP              | Plutonium-238     | 1.26 g  | 0.00327   | 0.00232 | 0.0217 | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.000458  | 0.00202 | 0.0183 | .001309524                     | pCi/g | YES                          |
| 1202064508    | LCS              | Plutonium-238     | 0.103 g | 7.32      | 0.607   | 0.258  | .081650485                     | pCi/g | NO                           |
|               |                  | Plutonium-239/240 | 0.103 g | 38.0      | 2.61    | 0.218  | .016019417                     | pCi/g | NO                           |
| 1202064506    | MB               | Plutonium-238     | 1.00 g  | 0.00841   | 0.00464 | 0.0261 | .00841                         | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.00 g  | 0.00165   | 0.00419 | 0.022  | .00165                         | pCi/g | YES                          |
| 247964001     | RE36-10-8489     | Plutonium-238     | 1.26 g  | 0.00291   | 0.00484 | 0.0197 | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.000178  | 0.00334 | 0.0166 | .001309524                     | pCi/g | YES                          |
| 247964002     | RE36-10-8486     | Plutonium-238     | 1.26 g  | 0.0149    | 0.00979 | 0.021  | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | -0.000506 | 0.00422 | 0.0178 | .001309524                     | pCi/g | YES                          |
| 247964003     | RE36-10-8487     | Plutonium-238     | 1.25 g  | 0.00386   | 0.00339 | 0.020  | .006728                        | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.00193   | 0.00239 | 0.0169 | .00132                         | pCi/g | YES                          |
| 247964004     | RE36-10-8462     | Plutonium-238     | 1.25 g  | 0.00943   | 0.00704 | 0.0252 | .006728                        | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.00433   | 0.00357 | 0.0213 | .00132                         | pCi/g | YES                          |
| 247964005     | RE36-10-8463     | Plutonium-238     | 1.25 g  | -0.00443  | 0.00586 | 0.0223 | .006728                        | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.00717   | 0.00396 | 0.0188 | .00132                         | pCi/g | NO                           |
| 247969001     | RE36-10-8490     | Plutonium-238     | 1.26 g  | 0.00754   | 0.00581 | 0.0191 | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.00471   | 0.00307 | 0.0181 | .001309524                     | pCi/g | YES                          |
| 247969002     | RE36-10-8470     | Plutonium-238     | 1.26 g  | 0.000938  | 0.00292 | 0.0222 | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.00763   | 0.00446 | 0.0188 | .001309524                     | pCi/g | NO                           |
| 247969003     | RE36-10-8476     | Plutonium-238     | 1.25 g  | -0.002    | 0.00276 | 0.0229 | .006728                        | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.00518   | 0.00301 | 0.0194 | .00132                         | pCi/g | YES                          |
| 247969004     | RE36-10-8480     | Plutonium-238     | 1.25 g  | -0.000858 | 0.00279 | 0.0259 | .006728                        | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.0114    | 0.00606 | 0.0219 | .00132                         | pCi/g | NO                           |
| 247969005     | RE36-10-8474     | Plutonium-238     | 1.25 g  | -0.0036   | 0.00454 | 0.0234 | .006728                        | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.000423  | 0.00562 | 0.0198 | .00132                         | pCi/g | YES                          |
| 247969006     | RE36-10-8478     | Plutonium-238     | 1.26 g  | 0.000815  | 0.00667 | 0.0227 | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.0041    | 0.00501 | 0.0192 | .001309524                     | pCi/g | YES                          |
| 247969007     | RE36-10-8483     | Plutonium-238     | 1.26 g  | 0.00359   | 0.00254 | 0.0238 | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.00537   | 0.00312 | 0.0201 | .001309524                     | pCi/g | YES                          |
| 247969008     | RE36-10-8482     | Plutonium-238     | 1.26 g  | 0.00365   | 0.00259 | 0.0243 | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.00183   | 0.00183 | 0.0205 | .001309524                     | pCi/g | YES                          |
| 247970001     | RE46-10-13181    | Plutonium-238     | 1.25 g  | 0.00492   | 0.00286 | 0.0218 | .006728                        | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.00164   | 0.00164 | 0.0184 | .00132                         | pCi/g | YES                          |
| 247970002     | RE46-10-13178    | Plutonium-238     | 1.26 g  | 0.000909  | 0.00283 | 0.0215 | .006674603                     | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.00532   | 0.00346 | 0.0182 | .001309524                     | pCi/g | YES                          |
| 247970003     | RE46-10-13179    | Plutonium-238     | 1.25 g  | 0.00314   | 0.00223 | 0.0208 | .006728                        | pCi/g | YES                          |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.00785   | 0.00354 | 0.0176 | .00132                         | pCi/g | NO                           |
| 247970004     | RE46-10-13180    | Plutonium-238     | 1.26 g  | 0.0194    | 0.00865 | 0.0245 | .006674603                     | pCi/g | YES                          |



## Blank Correction Report

| GEL Sample ID | Client sample ID | Parameter         | Aliquot | Result    | TPU     | MDA    | Aliquot<br>Corrected<br>Blank Result | Units | Activity <5X<br>Corrected<br>Blank |
|---------------|------------------|-------------------|---------|-----------|---------|--------|--------------------------------------|-------|------------------------------------|
| 247970004     | RE46-10-13180    | Plutonium-239/240 | 1.26 g  | -0.000295 | 0.00347 | 0.0207 | .001309524                           | pCi/g | YES                                |
| 247970005     | RE46-10-13177    | Plutonium-238     | 1.25 g  | 0.00103   | 0.0032  | 0.0244 | .006728                              | pCi/g | YES                                |
|               |                  | Plutonium-239/240 | 1.25 g  | 0.00705   | 0.00506 | 0.0206 | .00132                               | pCi/g | NO                                 |
| 247970006     | RE46-10-13176    | Plutonium-238     | 1.26 g  | 0.00475   | 0.00434 | 0.0202 | .006674603                           | pCi/g | YES                                |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.00914   | 0.00377 | 0.0171 | .001309524                           | pCi/g | NO                                 |
| 247970007     | RE46-10-13182    | Plutonium-238     | 1.26 g  | 0.00505   | 0.00329 | 0.0204 | .006674603                           | pCi/g | YES                                |
|               |                  | Plutonium-239/240 | 1.26 g  | 0.00351   | 0.00289 | 0.0173 | .001309524                           | pCi/g | YES                                |

GEL Laboratories LLC  
ALPHA SPECTROSCOPY REPORT

|   |  |  |
|---|--|--|
| BATCH NUMBER : 962402<br>SAMPLE ID : S1202064508_PU<br>SAMPLE QTY : 0.103 G<br>SAMPLE DATE : 15-MAR-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 93.444 | CHAMBER : 112<br>DETECTOR S/N : 78261<br>AVERAGE %EFFICIENCY : 33.5504<br>COUNT DATE : 22-MAR-2010 09:59:08<br>ELAPSED LIVE TIME(SEC) : 43199.99 | LIB FILE : ENV ALPHA PU<br>BKG FILE : B112.CNF:698<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 59999.99<br>EFF FILE : W112.CNF:223<br>CAL DATE : 12-MAR-2010 |
|---|--|--|

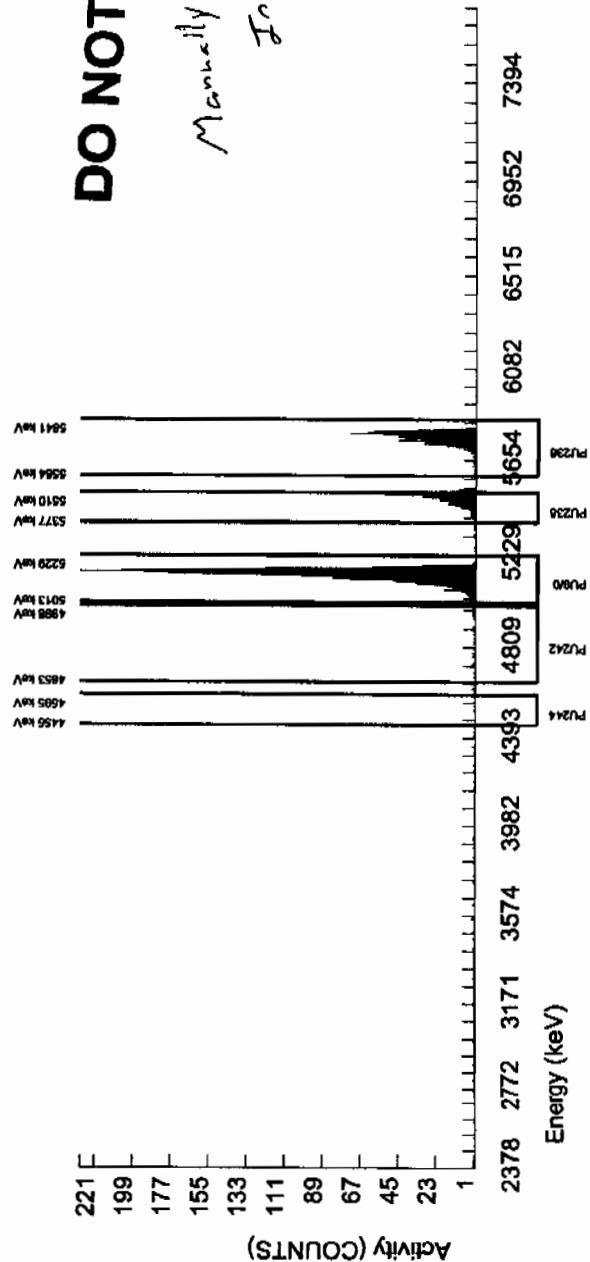
|   |   |   |
|---|---|---|
| TRACER<br>ID : 1430-C<br>NUCLIDE : PU-236<br>NOMINAL : 2.9801E+00 dpm<br>RESULTS : 2.7848E+00 dpm | MS/MSD<br>ID : 0244-B<br>NUCLIDE : PU-9/0<br>NOMINAL : 4.1778E+01 pCi/G | LCS/LCSD<br>ID : 0244-B<br>NUCLIDE : PU-9/0<br>NOMINAL : 4.1778E+01 pCi/G |
|---|---|---|

NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN     | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|-----------|----------------|-------------|-----------|-----------|-----------|
| PU-236  | 5749.000       | 5763.961    | 46.340    | 670.000    | 669.280  | 0.720    | 0.8485 | 100.0000  | 1.30E+01       | 9.85E-01    | 3.55E-02  | 1.23E-01  | 5.04E-01  |
| PU-238  | 5499.000       | 5481.196    | 16.787    | 283.000    | 282.280  | 0.720    | 2.4495 | 99.900000 | 5.48E+00       | 4.83E-01    | 1.02E-01  | 2.58E-01  | 3.27E-01  |
| PU-9/0  | 5155.000       | 5146.969    | 33.193    | 1959.000   | 1958.280 | 0.720    | 1.9732 | 99.900000 | 3.80E+01       | 2.61E+00    | 8.26E-02  | 2.18E-01  | 8.58E-01  |
| PU242   | 4890.000       | 4857.135    | 0.000     | 36.000     | 33.840   | 2.160    | *****  | 100.0000  | 6.56E-01       | 1.26E-01    | 5.21E+00  | 1.05E+01  | 1.19E-01  |
| PU-244  | 4589.000       | 4548.650    | 0.000     | 8.000      | 8.000    | 0.000    | 6.4609 | 99.900000 | 1.55E-01       | 5.58E-02    | 2.70E-01  | 5.93E-01  | 5.49E-02  |

NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of PU-236 calculated as sqrt(BKG AREA).



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

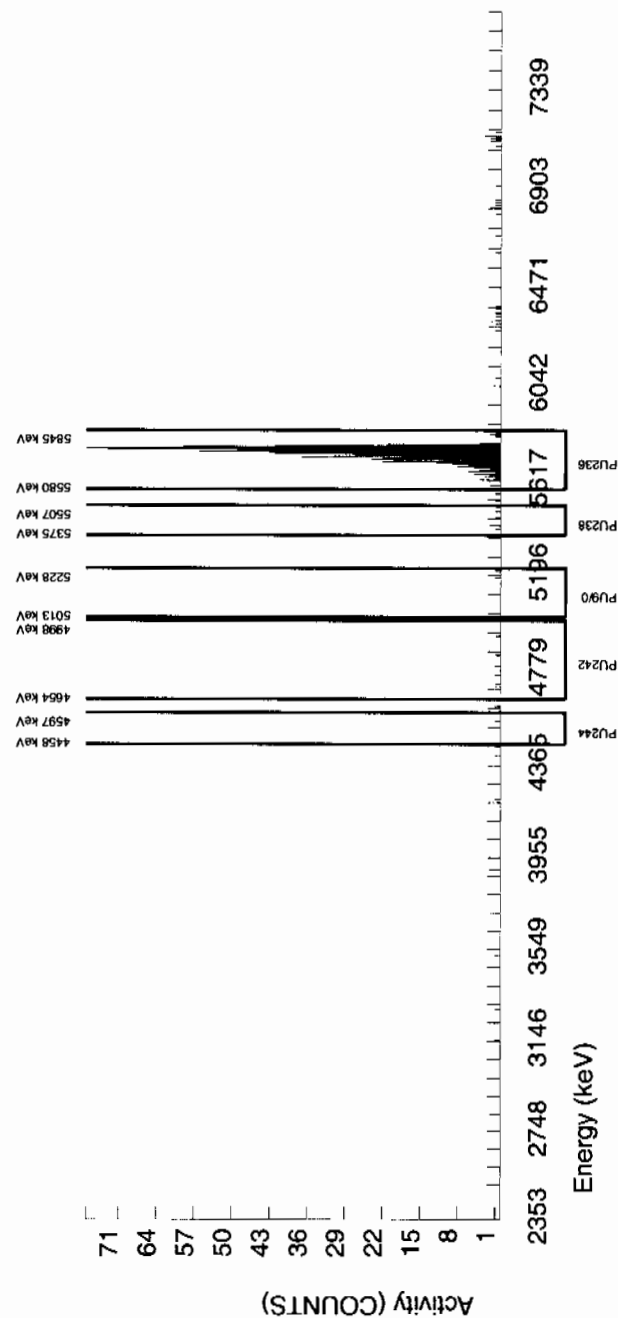
|   |  |  |  |
|---|--|--|--|
| BATCH NUMBER : 962402<br>SAMPLE ID : S0247964001_PU<br>SAMPLE QTY : 1.259 G<br>SAMPLE DATE : 19-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 93.667 |  | CHAMBER : 013<br>DETECTOR S/N : 78790<br>AVERAGE %EFFICIENCY : 35.8414<br>COUNT DATE : 22-MAR-2010 22:24:18<br>ELAPSED LIVE TIME(SEC) : 43200.00 | LIB FILE : ENV_ALPHA_PU<br>BKG FILE : B013.CNF;1105<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W013.CNF;330<br>CAL DATE : 4-MAR-2010 |
|---|--|--|--|

|   |   |   |
|---|---|---|
| TRACER<br>ID : 1430-C<br>NUCLIDE : PU-236<br>NOMINAL : 3.0280E+00 dpm<br>RESULTS : 2.8362E+00 dpm | MS/MSD<br>ID : 0244-B<br>NUCLIDE : PU-9/0<br>NOMINAL : 4.1778E+01 pCi/G | LCS/LCSD<br>ID : 0244-B<br>NUCLIDE : PU-9/0<br>NOMINAL : 4.1778E+01 pCi/G |
|---|---|---|

| NUCLIDE ACTIVITY SUMMARY |                |             |           |            |          |          |        |           |                |             |           |
|--------------------------|----------------|-------------|-----------|------------|----------|----------|--------|-----------|----------------|-------------|-----------|
| NUCLIDE                  | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN     | ACTIVITY pCi/G | TPU 1-SIGMA | UNC pCi/G |
| PU-236                   | 5749.000       | 5746.611    | 36.051    | 733.000    | 716.440  | 16.560   | 4.0694 | 100.0000  | 1.08E+00       | 7.38E-02    | 4.13E-02  |
| PU-238                   | 5499.000       | 5447.757    | 7.217     | 7.000      | 1.960    | 5.040    | 2.4495 | 99.900000 | 2.91E-03       | 4.84E-03    | 4.83E-03  |
| PU-9/0                   | 5155.000       | 5211.987    | 0.000     | 3.000      | 0.120    | 2.880    | 1.9732 | 99.900000 | 1.78E-04       | 3.34E-03    | 3.34E-03  |
| PU242                    | 4890.000       | 4799.615    | 211.302   | 6.000      | 5.280    | 0.720    | *****  | 100.0000  | 7.82E-03       | 3.80E-03    | 3.78E-03  |
| PU-244                   | 4589.000       | 4566.346    | 4.914     | 1.000      | 0.280    | 0.720    | 6.4609 | 99.900000 | 4.15E-04       | 1.83E-03    | 1.83E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.
- (Sg updated 8-MAR-2010)
- \* BKG Sg of PU-236 calculated as sqrt(BKG AREA).



**GEL Laboratories LLC**  
**ALPHA SPECTROSCOPY REPORT**

|              |                      |                        |                      |                    |               |
|--------------|----------------------|------------------------|----------------------|--------------------|---------------|
| BATCH NUMBER | 962402               | CHAMBER                | 014                  | LIB FILE           | ENV_ALPHA_PU  |
| SAMPLE ID    | S0247964002_PU       | DETECTOR S/N           | 67616                | BKG FILE           | B014.CNF;1106 |
| SAMPLE QTY   | 1.255 G              | AVERAGE %EFFICIENCY    | 33.5532              | BKG DATE           | 21-MAR-2010   |
| SAMPLE DATE  | 19-FEB-2010 00:00:00 | COUNT DATE             | 22-MAR-2010 22:24:18 | BKG LIVE TIME(SEC) | 60000.00      |
| ANALYST      | JXH2                 | ELAPSED LIVE TIME(SEC) | 43200.00             | EFF FILE           | W014.CNF;328  |
| % YIELD      | 93.982               |                        |                      | CAL DATE           | 4-MAR-2010    |

|                          |                            |                            |
|--------------------------|----------------------------|----------------------------|
| TRACER                   | MS/MSD                     | LCS/LCSD                   |
| ID : 1430-C              | ID : 0244-B                | ID : 0244-B                |
| NUCLIDE : PU-236         | NUCLIDE : PU-9/0           | NUCLIDE : PU-9/0           |
| NOMINAL : 3.0280E+00 dpm | NOMINAL : 4.1778E+01 pCi/G | NOMINAL : 4.1778E+01 pCi/G |

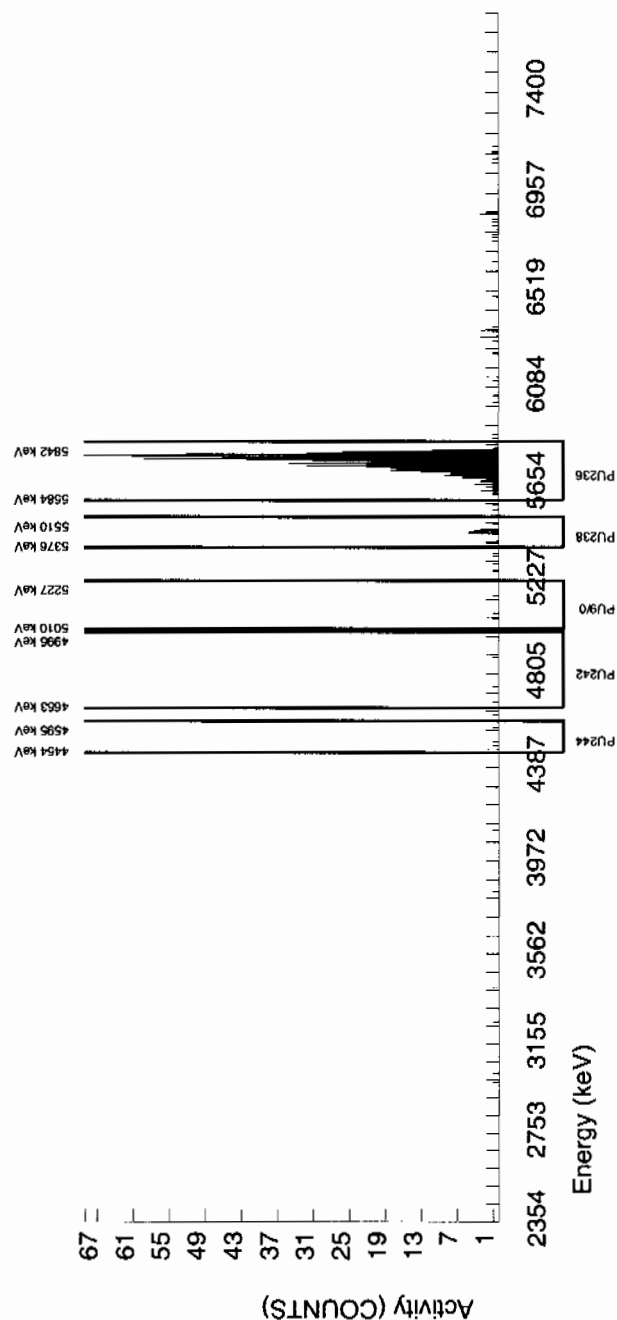
| LCS/LCSD<br>ID | NUCLIDE | NOMINAL |
|----------------|---------|---------|
|----------------|---------|---------|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN    | ACTIVITY pCi/g | TPU 1-SIGMA | DLC pCi/g | MDC pCi/g | UNC pCi/g |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|----------|----------------|-------------|-----------|-----------|-----------|
| PU-236  | 5749.000       | 5760.645    | 44.037    | 696.000    | 672.960  | 23.040   | 4.8000 | 100.0000 | 1.09E+00       | 7.59E-02    | 1.64E-02  | 3.70E-02  | 4.31E-02  |
| PU-238  | 5499.000       | 5444.272    | 21.367    | 26.000     | 9.440    | 16.560   | 2.4495 | 99.90000 | 1.49E-02       | 9.79E-03    | 8.36E-03  | 2.10E-02  | 9.75E-03  |
| PU-9/0  | 5155.000       | 5072.513    | 4.955     | 4.000      | -0.320   | 4.320    | 1.9732 | 99.90000 | -5.06E-04      | 4.22E-03    | 6.74E-03  | 1.78E-02  | 4.22E-03  |
| PU242   | 4890.000       | 4804.979    | 208.100   | 4.000      | 2.560    | 1.440    | *****  | 100.0000 | 4.05E-03       | 3.56E-03    | 4.25E-01  | 8.54E-01  | 3.55E-03  |
| PU-244  | 4589.000       | 4522.082    | 79.276    | 3.000      | 3.000    | 0.000    | 6.4609 | 99.90000 | 4.75E-03       | 2.75E-03    | 2.21E-02  | 4.84E-02  | 2.74E-03  |

## NOTES:

\* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)



**GEL Laboratories LLC**  
**ALPHA SPECTROSCOPY REPORT**

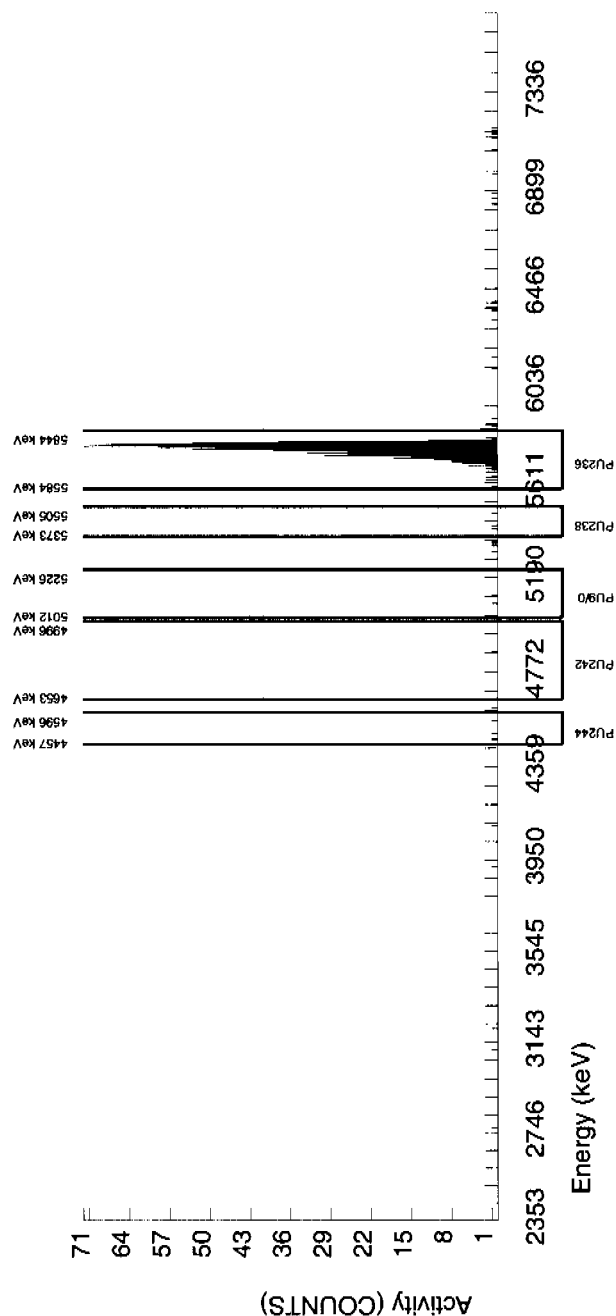
|   |                |             |           |  |          |          |        |  |                |             |           |           |           |
|---|----------------|-------------|-----------|--|----------|----------|--------|--|----------------|-------------|-----------|-----------|-----------|
| BATCH NUMBER : 962402<br>SAMPLE ID : S0247964003_PU<br>SAMPLE QTY : 1.254 G<br>SAMPLE DATE : 19-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 98.978 |                |             |           | CHAMBER : 016<br>DETECTOR S/N : 78774<br>AVERAGE %EFFICIENCY : 33.4863<br>COUNT DATE : 22-MAR-2010 22:24:18<br>ELAPSED LIVE TIME(SEC) : 43200.00 |          |          |        | LIB FILE : ENV_ALPHA_PU<br>BKG FILE : B016.CNF;1101<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W016.CNF;313<br>CAL DATE : 4-MAR-2010 |                |             |           |           |           |
| TRACER<br>ID : 1430-C<br>NUCLIDE : PU-236<br>NOMINAL : 3.0280E+00 dpm<br>RESULTS : 2.9971E+00 dpm   |                |             |           | MS/MSD<br>ID : 0244-B<br>NUCLIDE : PU-9/0<br>NOMINAL : 4.1778E+01 pCi/G  |          |          |        | LCS/LCSD<br>ID : 0244-B<br>NUCLIDE : PU-9/0<br>NOMINAL : 4.1778E+01 pCi/G  |                |             |           |           |           |
| NUCLEIDE ACTIVITY SUMMARY   |                |             |           |  |          |          |        |  |                |             |           |           |           |
| NUCLIDE   | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA   | NET AREA | BKG AREA | BKG Sg | %ABUN  | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
| PU-236  | 5749.000       | 5766.884    | 40.396    | 721.000  | 707.320  | 13.680   | 3.6986 | 100.0000   | 1.09E+00       | 7.42E-02    | 1.20E-02  | 2.81E-02  | 4.16E-02  |
| PU-238  | 5499.000       | 5432.693    | 67.836    | 4.000  | 2.560    | 1.440    | 2.4495 | 99.900000  | 3.86E-03       | 3.39E-03    | 7.96E-03  | 2.00E-02  | 3.38E-03  |
| PU-9/0  | 5155.000       | 5097.983    | 39.112    | 2.000  | 1.280    | 0.720    | 1.9732 | 99.900000  | 1.93E-03       | 2.39E-03    | 6.41E-03  | 1.69E-02  | 2.39E-03  |
| PU242   | 4890.000       | 4865.855    | 4.889     | 1.000  | -3.320   | 4.320    | *****  | 100.0000   | -5.00E-03      | 3.05E+03    | 4.05E-01  | 8.14E-01  | 3.05E-03  |
| PU-244  | 4589.000       | 4510.964    | 82.503    | 4.000  | 3.280    | 0.720    | 6.4609 | 99.900000  | 4.94E-03       | 3.22E-03    | 2.10E-02  | 4.61E-02  | 3.20E-03  |

## NOTES:

\* BKG Sg calculated via blank population.

(Sg updated 8-MAR-2010)

\* BKG Sg of PU-236 calculated as sqrt(BKG AREA).



GEL Laboratories LLC  
ALPHA SPECTROSCOPY REPORT

|                                    |                                   |                               |
|------------------------------------|-----------------------------------|-------------------------------|
| BATCH NUMBER : 962402              | CHAMBER : 017                     | LIB FILE : ENV_ALPHA_PU       |
| SAMPLE ID : S0247964004_PU         | DETECTOR S/N : 78791              | BKG FILE : B017.CNF;1948      |
| SAMPLE QTY : 1.250 G               | AVERAGE %EFFICIENCY : 29.7179     | BKG DATE : 21-MAR-2010        |
| SAMPLE DATE : 19-FEB-2010 00:00:00 | COUNT DATE : 22-MAR-2010 22:24:18 | BKG LIVE TIME(SEC) : 60000.00 |
| ANALYST : JXH2                     | ELAPSED LIVE TIME(SEC) : 43200.00 | EFF FILE : W017.CNF;1264      |
| % YIELD : 88.780                   |                                   | CAL DATE : 4-MAR-2010         |

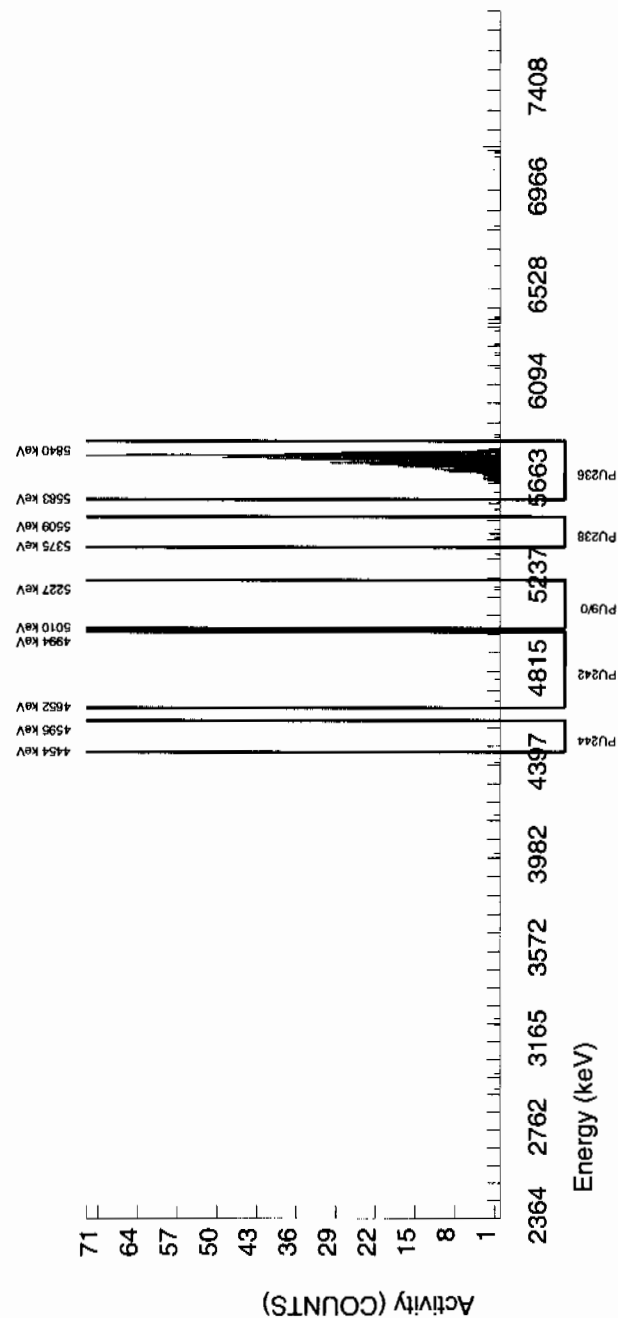
|                          |                            |                            |
|--------------------------|----------------------------|----------------------------|
| TRACER                   | MS/MSD                     | LCS/LCSD                   |
| ID : 1430-C              | ID : 0244-B                | ID : 0244-B                |
| NUCLIDE : PU-236         | NUCLIDE : PU-9/0           | NUCLIDE : PU-9/0           |
| NOMINAL : 3.0280E+00 dpm | NOMINAL : 4.1778E+01 pCi/G | NOMINAL : 4.1778E+01 pCi/G |
| RESULTS : 2.6883E+00 dpm |                            |                            |

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN     | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|-----------|----------------|-------------|-----------|-----------|-----------|
| PU-236  | 5749.000       | 5763.079    | 28.422    | 576.000    | 563.040  | 12.960   | 3.6000 | 100.0000  | 1.09E+00       | 8.04E-02    | 1.47E-02  | 3.46E-02  | 4.69E-02  |
| PU-238  | 5499.000       | 5416.314    | 0.000     | 10.000     | 4.960    | 5.040    | 2.4495 | 99.900000 | 9.43E-03       | 7.04E-03    | 1.00E-02  | 2.52E-02  | 7.02E-03  |
| PU-9/0  | 5155.000       | 5180.708    | 49.590    | 3.000      | 2.280    | 0.720    | 1.9732 | 99.900000 | 4.33E-03       | 3.57E-03    | 8.08E-03  | 2.13E-02  | 3.56E-03  |
| PU242   | 4890.000       | 4738.813    | 99.181    | 2.000      | 0.560    | 1.440    | *****  | 100.0000  | 1.06E-03       | 3.31E-03    | 5.10E-01  | 1.03E+00  | 3.31E-03  |
| PU-244  | 4589.000       | 4524.268    | 0.000     | 0.000      | -0.720   | 0.720    | 6.4609 | 99.900000 | -1.37E-03      | 2.34E-03    | 2.65E-02  | 5.81E-02  | 2.34E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.
- (Sg updated 8-MAR-2010)
- \* BKG Sg of PU-236 calculated as sqrt(BKG AREA).



**GEL Laboratories LLC**  
**ALPHA SPECTROSCOPY REPORT**

|              |                      |                        |                      |                    |               |
|--------------|----------------------|------------------------|----------------------|--------------------|---------------|
| BATCH NUMBER | 962402               | CHAMBER                | 018                  | LIB FILE           | ENV_ALPHA_PU  |
| SAMPLE ID    | S0247964005_PU       | DETECTOR S/N           | 78782                | BKG FILE           | B018.CNF;1100 |
| SAMPLE QTY   | 1.254 G              | AVERAGE %EFFICIENCY    | 33.5036              | BKG DATE           | 21-MAR-2010   |
| SAMPLE DATE  | 19-FEB-2010 00:00:00 | COUNT DATE             | 22-MAR-2010 22:24:18 | BKG LIVE TIME(SEC) | 60000.00      |
| ANALYST      | JXH2                 | ELAPSED LIVE TIME(SEC) | 43200.00             | EFF FILE           | W018.CNF;308  |
| % YIELD      | 88.947               |                        |                      | CAL DATE           | 4-MAR-2010    |

|         |                |         |                  |          |                  |
|---------|----------------|---------|------------------|----------|------------------|
| TRACER  | ID : 1430-C    | MS/MSD  | ID : 0244-B      | LCS/LCSD | ID : 0244-B      |
| NUCLIDE | PU-236         | NUCLIDE | PU-9/0           | NUCLIDE  | PU-9/0           |
| NOMINAL | 3.0280E+00 dpm | NOMINAL | 4.1778E+01 pCi/G | NOMINAL  | 4.1778E+01 pCi/G |
| RESULTS | 2.6933E+00 dpm |         |                  |          |                  |

## NUCLIDE ACTIVITY SUMMARY

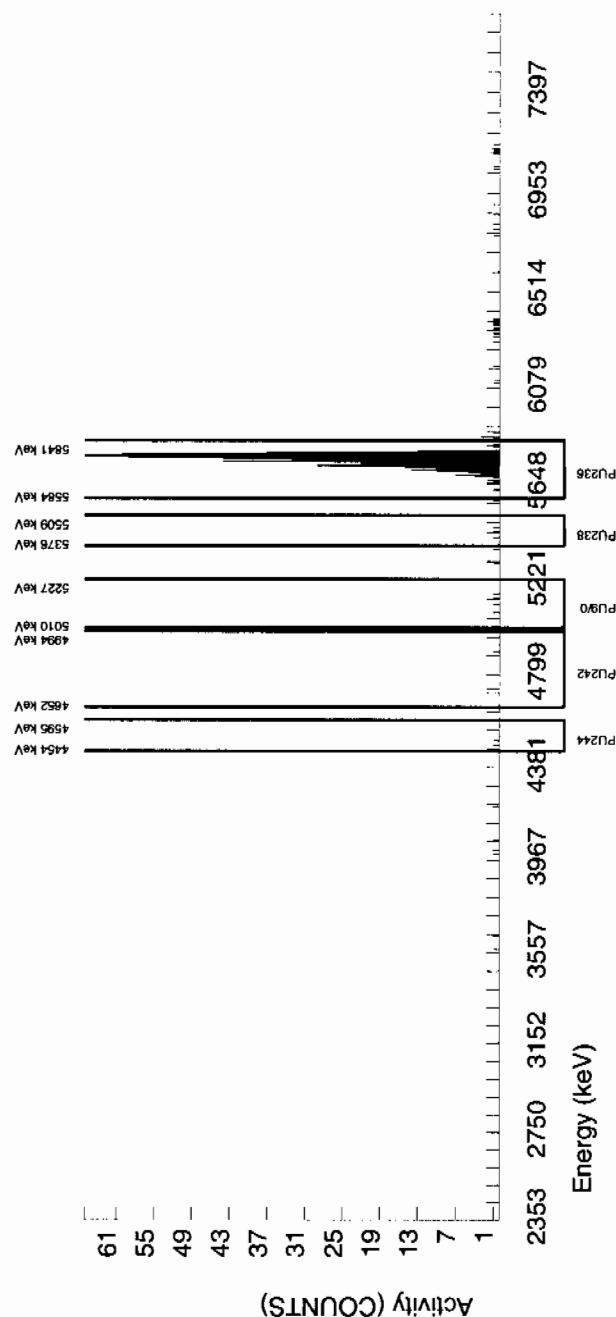
| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN     | ACTIVITY  | TPU 1-SIGMA | DLG pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|-----------|-----------|-------------|-----------|-----------|-----------|
| PU-236  | 5749.000       | 5759.799    | 38.351    | 641.000    | 635.960  | 5.040    | 2.2450 | 100.0000  | 1.09E+00  | 7.63E-02    | 8.11E-03  | 2.08E-02  | 4.34E-02  |
| PU-238  | 5499.000       | 5433.259    | 7.250     | 6.000      | -2.640   | 8.640    | 2.4495 | 99.900000 | -4.43E-03 | 5.86E-03    | 8.86E-03  | 2.23E-02  | 5.86E-03  |
| PU-9/0  | 5155.000       | 5109.023    | 138.207   | 5.000      | 4.280    | 0.720    | 1.9732 | 99.900000 | 7.17E-03  | 3.96E-03    | 7.13E-03  | 1.88E-02  | 3.94E-03  |
| PU242   | 4890.000       | 4795.475    | 4.936     | 3.000      | 0.120    | 2.880    | *****  | 100.0000  | 2.01E-04  | 3.77E-03    | 4.50E-01  | 9.05E-01  | 3.77E-03  |
| PU-244  | 4589.000       | 4495.385    | 24.680    | 2.000      | 2.000    | 0.000    | 6.4609 | 99.900000 | 3.35E-03  | 2.38E-03    | 2.34E-02  | 5.13E-02  | 2.37E-03  |

## NOTES:

\* BKG Sg calculated via blank population.

(Sg updated 8-MAR-2010)

\* BKG Sq of PU-236 calculated as sqrt(BKG AREA).



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|   |  |   |  |
|---|--|---|--|
| <b>BATCH NUMBER :</b> 962402<br><b>SAMPLE ID :</b> S0247970001_PU<br><b>SAMPLE QTY :</b> 1.254 G<br><b>SAMPLE DATE :</b> 23-FEB-2010 00:00:00<br><b>ANALYST :</b> JXH2<br><b>% YIELD :</b> 86.748 |  | <b>CHAMBER :</b> 091<br><b>DETECTOR S/N :</b> 78259<br><b>AVERAGE %EFFICIENCY :</b> 35.1113<br><b>COUNT DATE :</b> 22-MAR-2010 22:24:20<br><b>ELAPSED LIVE TIME(SEC) :</b> 43200.00 | <b>LIB FILE :</b> ENV_ALPHA_PU<br><b>BKG FILE :</b> B091.CNF:735<br><b>BKG DATE :</b> 21-MAR-2010<br><b>BKG LIVE TIME(SEC) :</b> 59999.99<br><b>EFF FILE :</b> W091.CNF:194<br><b>CAL DATE :</b> 12-MAR-2010 |
|---|--|---|--|

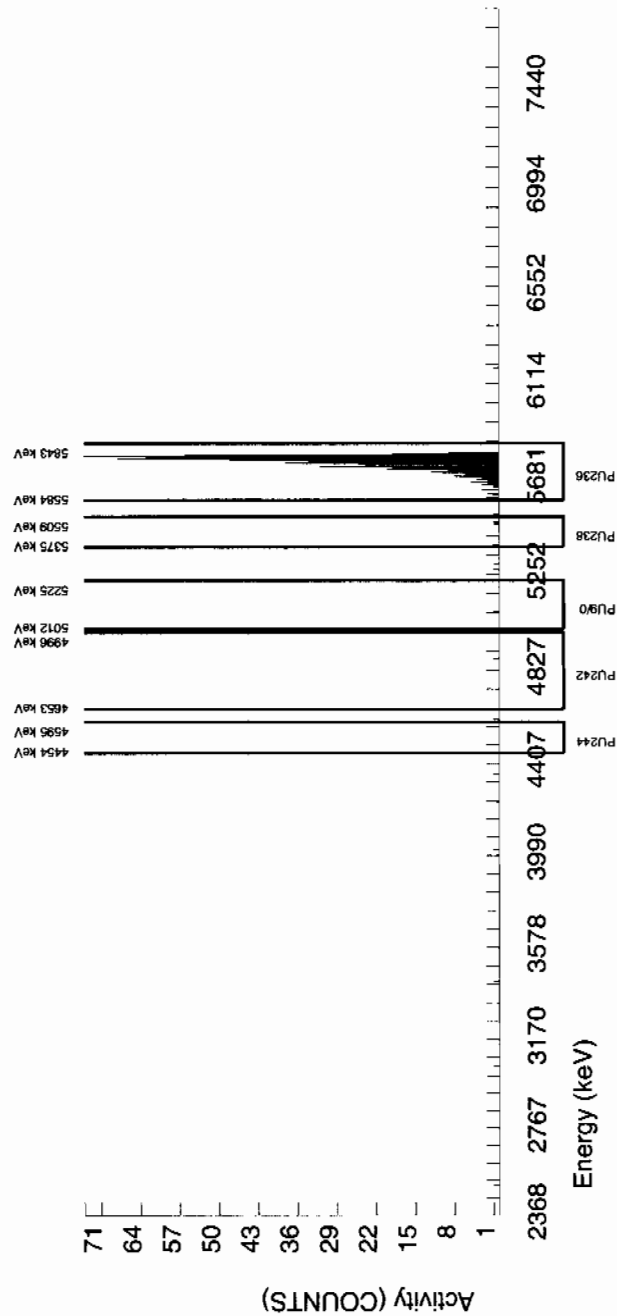
|  |   |   |
|--|---|---|
| <b>TRACER</b><br><b>ID :</b> 1430-C<br><b>NUCLIDE :</b> PU-236<br><b>NOMINAL :</b> 3.0200E+00 dpm<br><b>RESULTS :</b> 2.6198E+00 dpm | <b>MS/MSD</b><br><b>ID :</b> 0244-B<br><b>NUCLIDE :</b> PU-9/0<br><b>NOMINAL :</b> 4.1778E+01 pCi/G | <b>LCS/LCSD</b><br><b>ID :</b> 0244-B<br><b>NUCLIDE :</b> PU-9/0<br><b>NOMINAL :</b> 4.1778E+01 pCi/G |
|--|---|---|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN     | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|-----------|----------------|-------------|-----------|-----------|-----------|
| PU-236  | 5749.000       | 5761.071    | 33.797    | 650.000    | 650.000  | 0.000    | 0.0000 | 100.0000  | 1.08E+00       | 7.53E-02    | 0.00E+00  | 4.44E-03  | 4.25E-02  |
| PU-238  | 5499.000       | 5455.145    | 98.274    | 3.000      | 3.000    | 0.000    | 2.4495 | 99.900000 | 4.92E-03       | 2.86E-03    | 8.66E-03  | 2.18E-02  | 2.84E-03  |
| PU-9/0  | 5155.000       | 5092.066    | 4.964     | 1.000      | 1.000    | 0.000    | 1.9732 | 99.900000 | 1.64E-03       | 1.64E-03    | 6.98E-03  | 1.84E-02  | 1.64E-03  |
| PU242   | 4890.000       | 4885.217    | 4.964     | 1.000      | 1.000    | 0.000    | *****  | 100.0000  | 1.64E-03       | 1.64E-03    | 4.40E-01  | 8.85E-01  | 1.64E-03  |
| PU-244  | 4589.000       | 4524.354    | 0.000     | 0.000      | -2.160   | 2.160    | 6.4609 | 99.900000 | -3.54E-03      | 2.62E-03    | 2.29E-02  | 5.02E-02  | 2.62E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of PU-236 calculated as sqrt(BKG AREA).

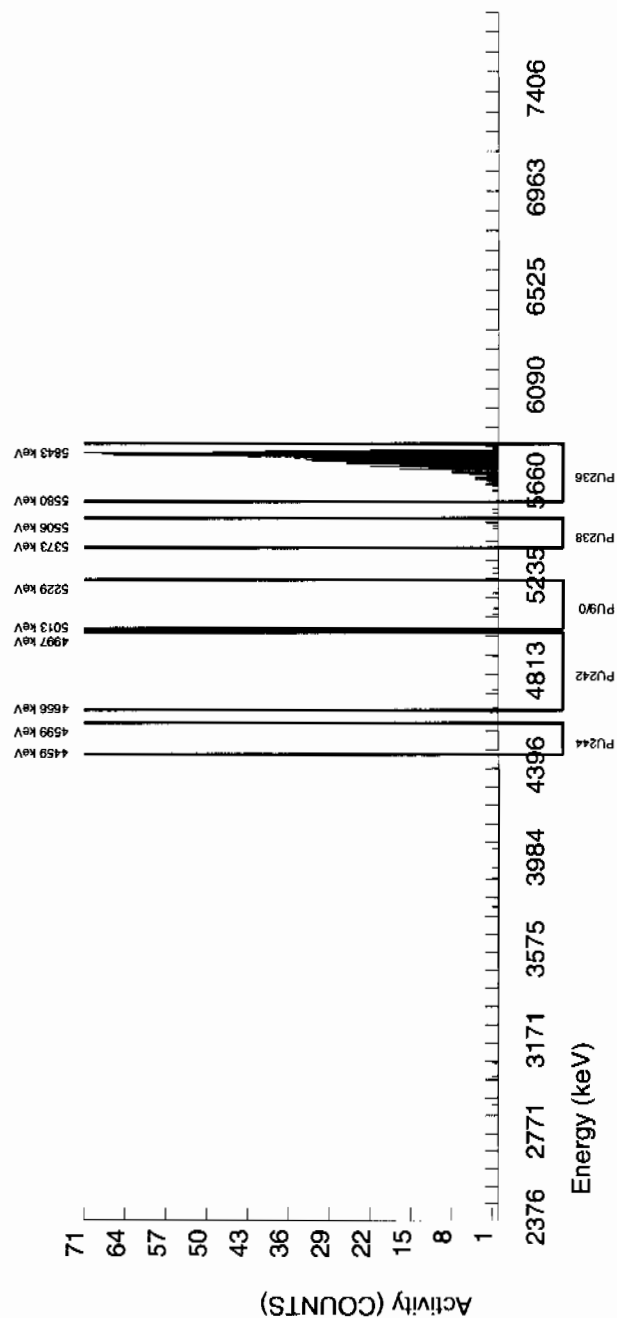




GEL Laboratories LLC  
ALPHA SPECTROSCOPY REPORT

|                                    |                |             |           |                                   |          |          |        |                               |                |             |           |           |           |
|------------------------------------|----------------|-------------|-----------|-----------------------------------|----------|----------|--------|-------------------------------|----------------|-------------|-----------|-----------|-----------|
| BATCH NUMBER : 962402              |                |             |           | CHAMBER : 099                     |          |          |        | LIB FILE : ENV_ALPHA_PU       |                |             |           |           |           |
| SAMPLE ID : S1202064506_PU         |                |             |           | DETECTOR S/N : 70317              |          |          |        | BKG FILE : B099.CNF:689       |                |             |           |           |           |
| SAMPLE QTY : 1.000 G               |                |             |           | AVERAGE %EFFICIENCY : 35.1904     |          |          |        | BKG DATE : 21-MAR-2010        |                |             |           |           |           |
| SAMPLE DATE : 15-MAR-2010 00:00:00 |                |             |           | COUNT DATE : 22-MAR-2010 22:24:21 |          |          |        | BKG LIVE TIME(SEC) : 60000.00 |                |             |           |           |           |
| ANALYST : JXH2                     |                |             |           | ELAPSED LIVE TIME(SEC) : 43199.99 |          |          |        | EFF FILE : W099.CNF:195       |                |             |           |           |           |
| % YIELD : 90.622                   |                |             |           |                                   |          |          |        | CAL DATE : 12-MAR-2010        |                |             |           |           |           |
| TRACER                             |                |             |           | MS/MSD                            |          |          |        | LCS/LCSD                      |                |             |           |           |           |
| ID : 1430-C                        |                |             |           | ID : 0244-B                       |          |          |        | ID : 0244-B                   |                |             |           |           |           |
| NUCLIDE : PU-236                   |                |             |           | NUCLIDE : PU-9/0                  |          |          |        | NUCLIDE : PU-9/0              |                |             |           |           |           |
| NOMINAL : 2.9801E+00 dpm           |                |             |           | NOMINAL : 4.1778E+01 pCi/G        |          |          |        | NOMINAL : 4.1778E+01 pCi/G    |                |             |           |           |           |
| RESULTS : 2.7007E+00 dpm           |                |             |           |                                   |          |          |        |                               |                |             |           |           |           |
| NUCLIDE ACTIVITY SUMMARY           |                |             |           |                                   |          |          |        |                               |                |             |           |           |           |
| NUCLIDE                            | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA                        | NET AREA | BKG AREA | BKG Sg | %ABUN                         | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
| PU-236                             | 5749.000       | 5778.249    | 29.614    | 682.000                           | 680.560  | 1.440    | 1.2000 | 100.0000                      | 1.34E+00       | 9.20E-02    | 5.08E-03  | 1.55E-02  | 5.16E-02  |
| PU-238                             | 5499.000       | 5486.406    | 4.915     | 5.000                             | 4.280    | 0.720    | 2.4495 | 99.90000                      | 8.41E-03       | 4.64E-03    | 1.04E-02  | 2.61E-02  | 4.61E-03  |
| PU-9/0                             | 5155.000       | 5121.910    | 93.394    | 3.000                             | 0.840    | 2.160    | 1.9732 | 99.90000                      | 1.65E-03       | 4.19E-03    | 8.36E-03  | 2.20E-02  | 4.19E-03  |
| PU242                              | 4890.000       | 4773.165    | 216.281   | 3.000                             | 2.280    | 0.720    | *****  | 100.0000                      | 4.47E-03       | 3.69E-03    | 5.28E-01  | 1.06E+00  | 3.68E-03  |
| PU-244                             | 4589.000       | 4528.731    | 0.000     | 0.000                             | -0.720   | 0.720    | 6.4609 | 99.90000                      | -1.41E-03      | 2.42E-03    | 2.74E-02  | 6.01E-02  | 2.42E-03  |

## NOTES:

\* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)\* BKG Sg of PU-236 calculated as  $\sqrt{\text{BKG AREA}}$ .

# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|  |   |   |
|--|---|---|
| <p>BATCH NUMBER : 962402<br/> SAMPLE ID : S1202064507_PU<br/> SAMPLE QTY : 1.260 G<br/> SAMPLE DATE : 23-FEB-2010 00:00:00<br/> ANALYST : JXH2<br/> % YIELD : 84.954</p> | <p>CHAMBER : 100<br/> DETECTOR S/N : 79456<br/> AVERAGE %EFFICIENCY : 35.7974<br/> COUNT DATE : 22-MAR-2010 22:24:21<br/> ELAPSED LIVE TIME(SEC) : 43199.99</p> | <p>LIB FILE : ENV_ALPHA_PU<br/> BKG FILE : B100.CNF;690<br/> BKG DATE : 21-MAR-2010<br/> BKG LIVE TIME(SEC) : 60000.00<br/> EFF FILE : W100.CNF;203<br/> CAL DATE : 12-MAR-2010</p> |
|--|---|---|

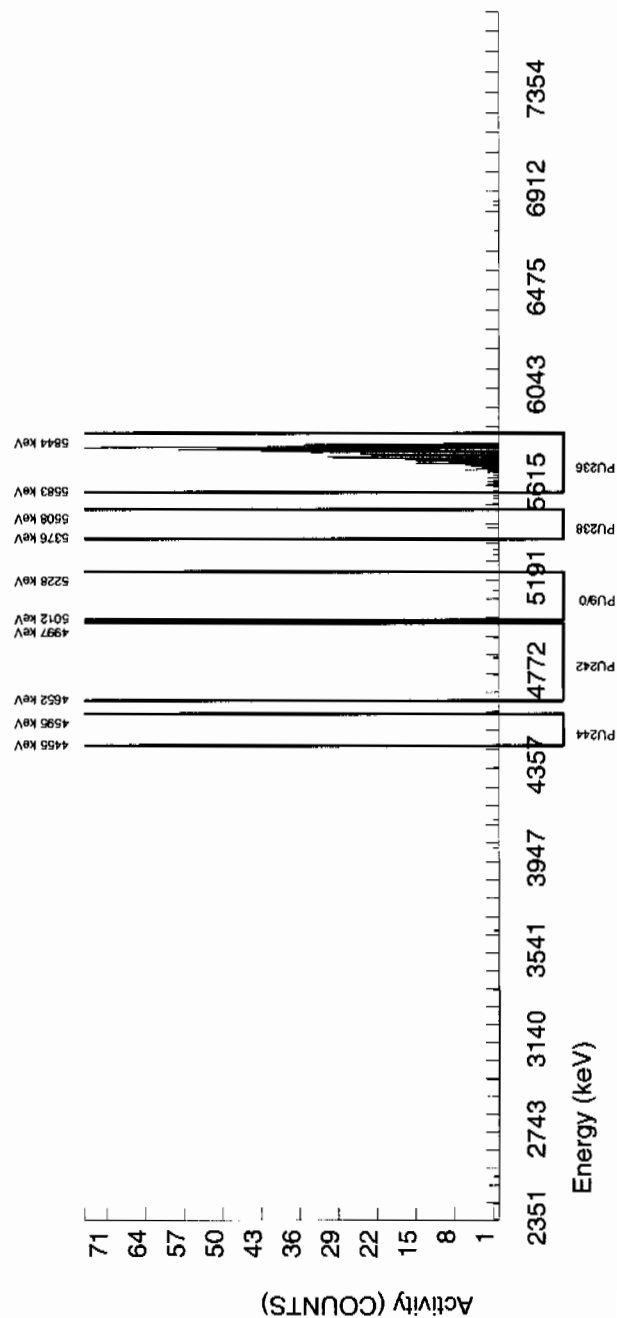
|  |  |  |
|--|--|--|
| <p>TRACER<br/> ID : 1430-C<br/> NUCLIDE : PU-236<br/> NOMINAL : 3.0200E+00 dpm<br/> RESULTS : 2.5656E+00 dpm</p> | <p>MS/MSD<br/> ID : 0244-B<br/> NUCLIDE : PU-9/0<br/> NOMINAL : 4.1778E+01 pCi/G</p> | <p>LCS/LCSD<br/> ID : 0244-B<br/> NUCLIDE : PU-9/0<br/> NOMINAL : 4.1778E+01 pCi/G</p> |
|--|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN     | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|-----------|----------------|-------------|-----------|-----------|-----------|
| PU-236  | 5749.000       | 5764.670    | 29.236    | 649.000    | 649.000  | 0.000    | 0.0000 | 100.0000  | 1.08E+00       | 7.50E-02    | 0.00E+00  | 4.42E-03  | 4.24E-02  |
| PU-238  | 5499.000       | 5428.885    | 4.877     | 2.000      | 2.000    | 0.000    | 2.4495 | 99.900000 | 3.27E-03       | 2.32E-03    | 8.64E-03  | 2.17E-02  | 2.31E-03  |
| PU-9/0  | 5155.000       | 5149.056    | 4.877     | 1.000      | 0.280    | 0.720    | 1.9732 | 99.900000 | 4.58E-04       | 2.02E-03    | 6.96E-03  | 1.83E-02  | 2.01E-03  |
| PU242   | 4890.000       | 4850.286    | 156.064   | 4.000      | 1.840    | 2.160    | *****  | 100.0000  | 3.00E-03       | 3.85E-03    | 4.39E-01  | 8.83E-01  | 3.85E-03  |
| PU-244  | 4589.000       | 4525.283    | 0.000     | 0.000      | 0.000    | 0.000    | 6.4609 | 99.900000 | 0.00E+00       | 1.64E-03    | 2.28E-02  | 5.00E-02  | 1.63E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of PU-236 calculated as sqrt(BKG AREA).



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|  |  |   |   |
|--|--|---|---|
| <p>BATCH NUMBER : 962402<br/> SAMPLE ID : S1202064508_PU<br/> SAMPLE QTY : 0.103 G<br/> SAMPLE DATE : 15-MAR-2010 00:00:00<br/> ANALYST : JXH2<br/> % YIELD : 93.444</p> |  | <p>CHAMBER : 112<br/> DETECTOR S/N : 78261<br/> AVERAGE %EFFICIENCY : 33.5504<br/> COUNT DATE : 22-MAR-2010 09:59:08<br/> ELAPSED LIVE TIME(SEC) : 43199.99</p> | <p>LIB FILE : ENV_ALPHA_PU<br/> BKG FILE : B112.CNF:698<br/> BKG DATE : 21-MAR-2010<br/> BKG LIVE TIME(SEC) : 59999.99<br/> EFF FILE : W112.CNF:223<br/> CAL DATE : 12-MAR-2010</p> |
|--|--|---|---|

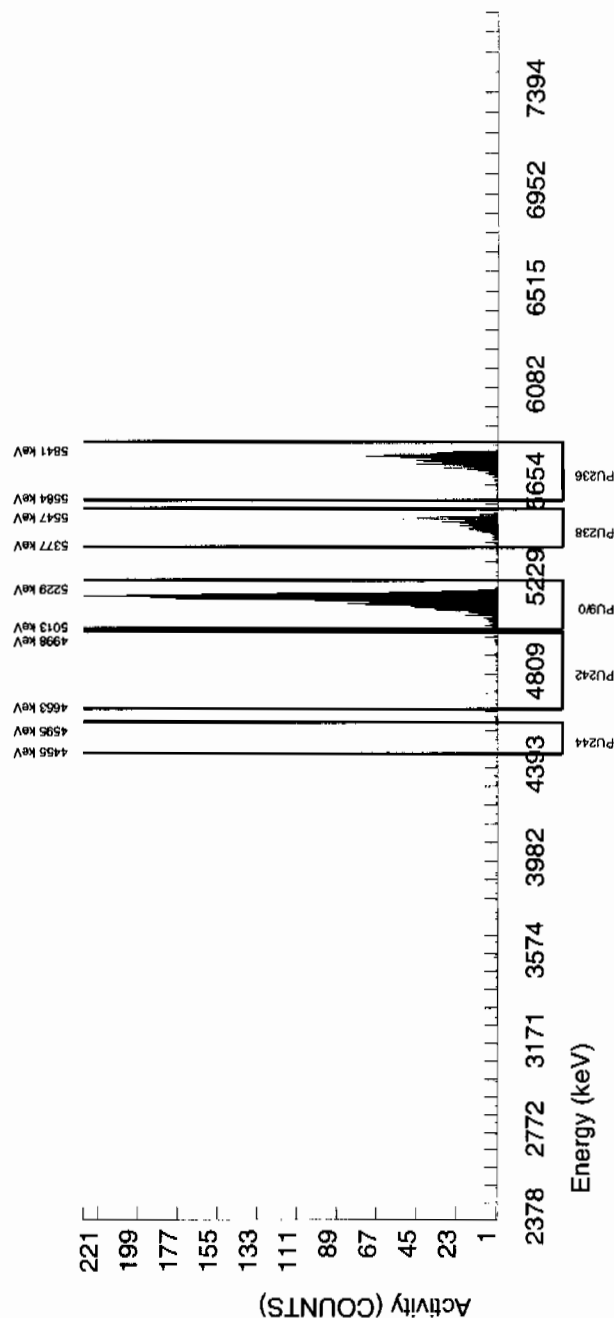
|  |  |  |
|--|--|--|
| <p>TRACER<br/> ID : 1430-C<br/> NUCLIDE : PU-236<br/> NOMINAL : 2.9801E+00 dpm<br/> RESULTS : 2.7848E+00 dpm</p> | <p>MS/MSD<br/> ID : 0244-B<br/> NUCLIDE : PU-9/0<br/> NOMINAL : 4.1778E+01 pCi/G</p> | <p>LCS/LCSD<br/> ID : 0244-B<br/> NUCLIDE : PU-9/0<br/> NOMINAL : 4.1778E+01 pCi/G</p> |
|--|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN     | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|-----------|----------------|-------------|-----------|-----------|-----------|
| PU-236  | 5749.000       | 5763.961    | 46.340    | 670.000    | 669.280  | 0.720    | 0.8485 | 100.0000  | 1.30E+01       | 9.85E-01    | 3.55E-02  | 1.23E-01  | 5.04E-01  |
| PU-238  | 5499.000       | 5490.862    | 27.735    | 378.000    | 377.280  | 0.720    | 2.4495 | 99.900000 | 7.32E+00       | 6.07E-01    | 1.02E-01  | 2.58E-01  | 3.77E-01  |
| PU-9/0  | 5155.000       | 5146.969    | 33.193    | 1959.000   | 1958.280 | 0.720    | 1.9732 | 99.900000 | 3.80E+01       | 2.61E+00    | 8.26E-02  | 2.18E-01  | 8.58E-01  |
| PU242   | 4890.000       | 4857.135    | 0.000     | 36.000     | 33.840   | 2.160    | *****  | 100.0000  | 6.56E-01       | 1.26E-01    | 5.21E+00  | 1.05E+01  | 1.19E-01  |
| PU-244  | 4589.000       | 4548.650    | 0.000     | 8.000      | 8.000    | 0.000    | 6.4609 | 99.900000 | 1.55E-01       | 5.58E-02    | 2.70E-01  | 5.93E-01  | 5.49E-02  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of PU-236 calculated as sqrt(BKG AREA).



# Radiochemistry Batch Checklist, Rev10

Batch# 962404 Product: U Date: 3/23/10

| Criteria:   | Yes | No | Comments |
|---|-----|----|----------|
| Sample Solids are less than or equal to 100 mg for GAB.   |     |    | N/A      |
| Samples have been blank corrected (if required)   | ✓   |    |          |
| If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay. | ✓   |    |          |
| Instrument source check is within limits.   | ✓   |    |          |
| Instrument bkg check is within limits.  | ✓   |    |          |
| Method RDL/ LLD has been met.   | ✓   |    |          |
| If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.   | ✓   |    |          |
| Or meets the client's required RER acceptance criteria.   |     |    |          |
| Tracer yield is 15-125% . Carrier yield 25-125%.  | ✓   |    |          |
| Or meets the client's contract acceptance criteria.   | ✓   |    |          |
| Method blank is less than the RDL/ LLD.   | ✓   |    |          |
| (If rad samples, < 5% of lowest activity)   | ✓   |    |          |
| Sample was run within hold time.  | ✓   |    |          |
| Sample was correctly preserved if required.   | ✓   |    |          |
| Smears Taken for Radioactive batches.   |     |    | N/A      |
| Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.   | ✓   |    |          |
| No blank spaces on data forms.  | ✓   |    |          |
| All line outs initialed and dated.  | ✓   |    |          |
| No transcription errors are apparent.   |     |    |          |
| Aux data is correct.  |     |    | N/A      |
| Client Special requirements page has been checked.  | ✓   |    |          |
| Raw Data and/ or spectrum are included and properly statused.   | ✓   |    |          |
| QC data entered into QC database and batch is in REVW   | ✓   |    |          |
| Hit notification complete (if necessary)  |     |    | N/A      |
| Batch entered into Case Narrative.  | ✓   |    |          |
| Batch Data Exception Reports (DER) completed, if applicable.  |     |    | N/A      |
| Batch Data Exception Reports (DER) second reviewed and disposition verified to be completed.  |     |    | N/A      |
| Aliquot Correction completed if required.   |     |    | N/A      |
| Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)                  | ✓   |    |          |

GEL Laboratories, LLC

RADchecklistrev10, revised 1/13/2010

Primary Review Performed By: [Signature] 3/23/10

Secondary Review Performed By: [Signature] 3/23/10

LANL

3/14 - 3/25

# Uranium Que Sheet

08-MAR-10

Batch #: 962404 Analyst: JXH2 First Client Due Date: 25-MAR-10 Internal Due Date: 14-MAR-10  
 Tracer Isotope: U-232U-236 Tracer Code: 1283-H Expiration Date: 12/31/10 Vol: 0.1 Analyzed Sequentially with Pu  
 LCS Isotope: U-238 LCS Code: Expiration Date: Vol: Pu-236 ID: AFA-900  
 Spike Isotope: U-238 Spike Code: Expiration Date: Vol: Vol: 3/23/10  
 Prep Date: 03/16/10 Initials: JHO Pipet ID: 292058 Balance ID: 50410272 Witness: JHO 3/15/10

| Sample ID    | Client Description          | Type   | Hazard Code | Min CRDL | Matrix     | Client    | Collection Date | Pos. | Label # | Wet/Dry Aliquot (g/l/n) | U Det # |
|--------------|-----------------------------|--------|-------------|----------|------------|-----------|-----------------|------|---------|-------------------------|---------|
| 247964001-1  | RE36-10-8489                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 19-FEB-10 | 1               | 1    | 0.509   | 119                     | -       |
| 247964002-1  | RE36-10-8486                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 19-FEB-10 | 2               | 2    | 0.500   | 120                     | -       |
| 247964003-1  | RE36-10-8487                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 19-FEB-10 | 3               | 3    | 0.512   | 121                     | 121     |
| 247964004-1  | RE36-10-8462                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 19-FEB-10 | 4               | 4    | 0.502   | 122                     | 122     |
| 247964005-1  | RE36-10-8463                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 19-FEB-10 | 5               | 5    | 0.501   | 123                     | 123     |
| 247969001-1  | RE36-10-8490                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 20-FEB-10 | 6               | 6    | 0.511   | 124                     | 124     |
| 247969002-1  | RE36-10-8470                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 20-FEB-10 | 7               | 7    | 0.506   | 125                     | 125     |
| 247969003-1  | RE36-10-8476                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 20-FEB-10 | 8               | 8    | 0.502   | 126                     | 126     |
| 247969004-1  | RE36-10-8480                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 20-FEB-10 | 9               | 9    | 0.512   | 127                     | 127     |
| 247969005-1  | RE36-10-8474                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 20-FEB-10 | 10              | 10   | 0.519   | 128                     | 128     |
| 247969006-1  | RE36-10-8478                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 20-FEB-10 | 11              | 11   | 0.505   | 129                     | 129     |
| 247969007-1  | RE36-10-8483                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 20-FEB-10 | 12              | 12   | 0.505   | 130                     | 130     |
| 247969008-1  | RE36-10-8482                | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 20-FEB-10 | 13              | 13   | 0.505   | 131                     | 131     |
| 247970001-1  | RE46-10-13181               | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 23-FEB-10 | 14              | 14   | 0.513   | 132                     | 132     |
| 247970002-1  | RE46-10-13178               | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 23-FEB-10 | 15              | 15   | 0.516   | 133                     | 133     |
| 247970003-1  | RE46-10-13179               | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 23-FEB-10 | 16              | 16   | 0.504   | 140                     | 140     |
| 247970004-1  | RE46-10-13180               | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 23-FEB-10 | 17              | 17   | 0.503   | 141                     | 141     |
| 247970005-1  | RE46-10-13177               | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 23-FEB-10 | 18              | 18   | 0.509   | 142                     | 142     |
| 247970006-1  | RE46-10-13176               | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 23-FEB-10 | 19              | 19   | 0.507   | 143                     | 143     |
| 247970007-1  | RE46-10-13182               | SAMPLE | .1 pCi/g    | SOIL     | LANL010    | 23-FEB-10 | 20              | 20   | 0.513   | 144                     | 144     |
| 1202064509-1 | MB for batch 962404         | MB     | .1 pCi/g    | SOIL     | QC ACCOUNT |           | 21              | 21   | 1.0     | 145                     | 145     |
| 1202064510-1 | RE46-10-13181(247970001DUP) | DUP    | .1 pCi/g    | SOIL     | QC ACCOUNT | 23-FEB-10 | 22              | 22   | 0.504   | 146                     | 146     |
| 1202064511-1 | LCS for batch 962404        | LCS    | .1 pCi/g    | SOIL     | QC ACCOUNT |           | 23              | 23   | 0.507   | 147                     | 147     |

\* SRM 0244-A exp 10/31/10 0.1013 gms 0.141 g

Choose SOP used: GL-RAD-A-011

Solid Sample Dissolution by: LEACH or DIGESTION  
 Circle One

Data Reviewed By: J. J. 3/23/10

# Blank Correction Report

**Batch ID 962404**

| GEL Sample ID | Client sample ID | Parameter       | Aliquot | Result  | TPU     | MDA    | Aliquot Corrected Blank Result | Units | Activity <5X Corrected Blank |
|---------------|------------------|-----------------|---------|---------|---------|--------|--------------------------------|-------|------------------------------|
| 1202064510    | DUP              | Uranium-233/234 | 0.504 g | 0.879   | 0.0807  | 0.083  | .013511905                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.504 g | 0.0473  | 0.0154  | 0.0507 | .003115079                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.504 g | 0.974   | 0.0873  | 0.0583 | .022619048                     | pCi/g | NO                           |
| 1202064511    | LCS              | Uranium-233/234 | 0.101 g | 6.71    | 0.641   | 0.544  | .067425743                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.101 g | 0.358   | 0.0966  | 0.332  | .015544554                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.101 g | 5.52    | 0.546   | 0.383  | .112871287                     | pCi/g | NO                           |
| 1202064509    | MB               | Uranium-233/234 | 1.00 g  | 0.00681 | 0.00298 | 0.0357 | .00681                         | pCi/g | YES                          |
|               |                  | Uranium-235/236 | 1.00 g  | 0.00157 | 0.00414 | 0.0218 | .00157                         | pCi/g | YES                          |
|               |                  | Uranium-238     | 1.00 g  | 0.0114  | 0.00428 | 0.0251 | .0114                          | pCi/g | YES                          |
| 247964001     | RE36-10-8489     | Uranium-233/234 | 0.509 g | 1.47    | 0.131   | 0.112  | .013379175                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.509 g | 0.0489  | 0.0159  | 0.0682 | .003084479                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.509 g | 1.40    | 0.126   | 0.0785 | .022396857                     | pCi/g | NO                           |
| 247964002     | RE36-10-8486     | Uranium-233/234 | 0.500 g | 1.56    | 0.137   | 0.109  | .01362                         | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.500 g | 0.0782  | 0.0198  | 0.0664 | .00314                         | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.500 g | 1.41    | 0.126   | 0.0764 | .0228                          | pCi/g | NO                           |
| 247964003     | RE36-10-8487     | Uranium-233/234 | 0.512 g | 1.40    | 0.123   | 0.0992 | .013300781                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.512 g | 0.0957  | 0.0224  | 0.0606 | .003066406                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.512 g | 1.40    | 0.123   | 0.0698 | .022265625                     | pCi/g | NO                           |
| 247964004     | RE36-10-8462     | Uranium-233/234 | 0.502 g | 1.16    | 0.105   | 0.100  | .013565737                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.502 g | 0.0439  | 0.0155  | 0.0611 | .003127490                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.502 g | 1.26    | 0.113   | 0.0703 | .022709163                     | pCi/g | NO                           |
| 247964005     | RE36-10-8463     | Uranium-233/234 | 0.501 g | 1.24    | 0.110   | 0.0958 | .013592814                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.501 g | 0.0714  | 0.019   | 0.0585 | .003133733                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.501 g | 1.20    | 0.107   | 0.0673 | .022754491                     | pCi/g | NO                           |
| 247969001     | RE36-10-8490     | Uranium-233/234 | 0.511 g | 0.944   | 0.0908  | 0.107  | .013326810                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.511 g | 0.056   | 0.0179  | 0.0651 | .003072407                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.511 g | 0.997   | 0.0951  | 0.0749 | .022309198                     | pCi/g | NO                           |
| 247969002     | RE36-10-8470     | Uranium-233/234 | 0.506 g | 1.09    | 0.0997  | 0.097  | .013458498                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.506 g | 0.051   | 0.0152  | 0.0593 | .003102767                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.506 g | 1.02    | 0.0942  | 0.0682 | .022529644                     | pCi/g | NO                           |
| 247969003     | RE36-10-8476     | Uranium-233/234 | 0.502 g | 1.00    | 0.0942  | 0.103  | .013565737                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.502 g | 0.0542  | 0.0161  | 0.0629 | .003127490                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.502 g | 0.968   | 0.0918  | 0.0724 | .022709163                     | pCi/g | NO                           |
| 247969004     | RE36-10-8480     | Uranium-233/234 | 0.512 g | 0.937   | 0.0883  | 0.099  | .013300781                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.512 g | 0.0564  | 0.0162  | 0.0605 | .003066406                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.512 g | 0.958   | 0.0899  | 0.0696 | .022265625                     | pCi/g | NO                           |
| 247969005     | RE36-10-8474     | Uranium-233/234 | 0.519 g | 1.10    | 0.102   | 0.104  | .013121387                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.519 g | 0.0411  | 0.014   | 0.0636 | .003025048                     | pCi/g | NO                           |
|               |                  | Uranium-238     | 0.519 g | 1.04    | 0.0977  | 0.0732 | .021965318                     | pCi/g | NO                           |
| 247969006     | RE36-10-8478     | Uranium-233/234 | 0.505 g | 0.927   | 0.0887  | 0.103  | .013485149                     | pCi/g | NO                           |
|               |                  | Uranium-235/236 | 0.505 g | 0.0585  | 0.0168  | 0.0627 | .003108911                     | pCi/g | NO                           |

## Blank Correction Report

| GEL Sample ID | Client sample ID | Parameter       | Aliquot | Result | TPU    | MDA    | Aliquot<br>Corrected<br>Blank Result | Units | Activity <5X<br>Corrected<br>Blank |
|---------------|------------------|-----------------|---------|--------|--------|--------|--------------------------------------|-------|------------------------------------|
| 247969006     | RE36-10-8478     | Uranium-238     | 0.505 g | 1.05   | 0.0979 | 0.0721 | .022574257                           | pCi/g | NO                                 |
| 247969007     | RE36-10-8483     | Uranium-233/234 | 0.505 g | 0.991  | 0.0938 | 0.105  | .013485149                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.505 g | 0.0688 | 0.0185 | 0.064  | .003108911                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.505 g | 1.05   | 0.0985 | 0.0736 | .022574257                           | pCi/g | NO                                 |
| 247969008     | RE36-10-8482     | Uranium-233/234 | 0.505 g | 1.07   | 0.103  | 0.120  | .013485149                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.505 g | 0.0629 | 0.0201 | 0.073  | .003108911                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.505 g | 1.10   | 0.105  | 0.084  | .022574257                           | pCi/g | NO                                 |
| 247970001     | RE46-10-13181    | Uranium-233/234 | 0.513 g | 0.853  | 0.0808 | 0.0933 | .013274854                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.513 g | 0.0532 | 0.0163 | 0.057  | .003060429                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.513 g | 0.814  | 0.0781 | 0.0656 | .022222222                           | pCi/g | NO                                 |
| 247970002     | RE46-10-13178    | Uranium-233/234 | 0.516 g | 0.748  | 0.0746 | 0.0979 | .013197674                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.516 g | 0.0601 | 0.0166 | 0.0598 | .003042636                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.516 g | 0.778  | 0.0763 | 0.0688 | .022093023                           | pCi/g | NO                                 |
| 247970003     | RE46-10-13179    | Uranium-233/234 | 0.504 g | 0.894  | 0.0861 | 0.102  | .013511905                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.504 g | 0.049  | 0.0152 | 0.0621 | .003115079                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.504 g | 0.956  | 0.0905 | 0.0715 | .022619048                           | pCi/g | NO                                 |
| 247970004     | RE46-10-13180    | Uranium-233/234 | 0.503 g | 0.581  | 0.0611 | 0.0953 | .013538767                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.503 g | 0.046  | 0.0154 | 0.0582 | .003121272                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.503 g | 0.750  | 0.0736 | 0.067  | .022664016                           | pCi/g | NO                                 |
| 247970005     | RE46-10-13177    | Uranium-233/234 | 0.509 g | 0.878  | 0.0841 | 0.0983 | .013379175                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.509 g | 0.0474 | 0.0147 | 0.0601 | .003084479                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.509 g | 0.879  | 0.0841 | 0.0691 | .022396857                           | pCi/g | NO                                 |
| 247970006     | RE46-10-13176    | Uranium-233/234 | 0.507 g | 0.802  | 0.0744 | 0.0812 | .013431953                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.507 g | 0.032  | 0.013  | 0.0496 | .003096647                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.507 g | 0.737  | 0.0697 | 0.0571 | .022485207                           | pCi/g | NO                                 |
| 247970007     | RE46-10-13182    | Uranium-233/234 | 0.513 g | 0.803  | 0.0741 | 0.0796 | .013274854                           | pCi/g | NO                                 |
|               |                  | Uranium-235/236 | 0.513 g | 0.0593 | 0.015  | 0.0486 | .003060429                           | pCi/g | NO                                 |
|               |                  | Uranium-238     | 0.513 g | 0.895  | 0.0809 | 0.0559 | .022222222                           | pCi/g | NO                                 |

# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|   |  |  |
|---|--|--|
| BATCH NUMBER : 962404<br>SAMPLE ID : S0247964001_UU<br>SAMPLE QTY : 0.509 G<br>SAMPLE DATE : 19-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 86.298 | CHAMBER : 119<br>DETECTOR S/N : 79450<br>AVERAGE %EFFICIENCY : 25.9082<br>COUNT DATE : 22-MAR-2010 21:19:45<br>ELAPSED LIVE TIME(SEC) : 60000.00 | LIB FILE : ENV_ALPHA_UU<br>BKG FILE : B119.CNF;471<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W119.CNF;123<br>CAL DATE : 19-MAR-2010 |
|---|--|--|

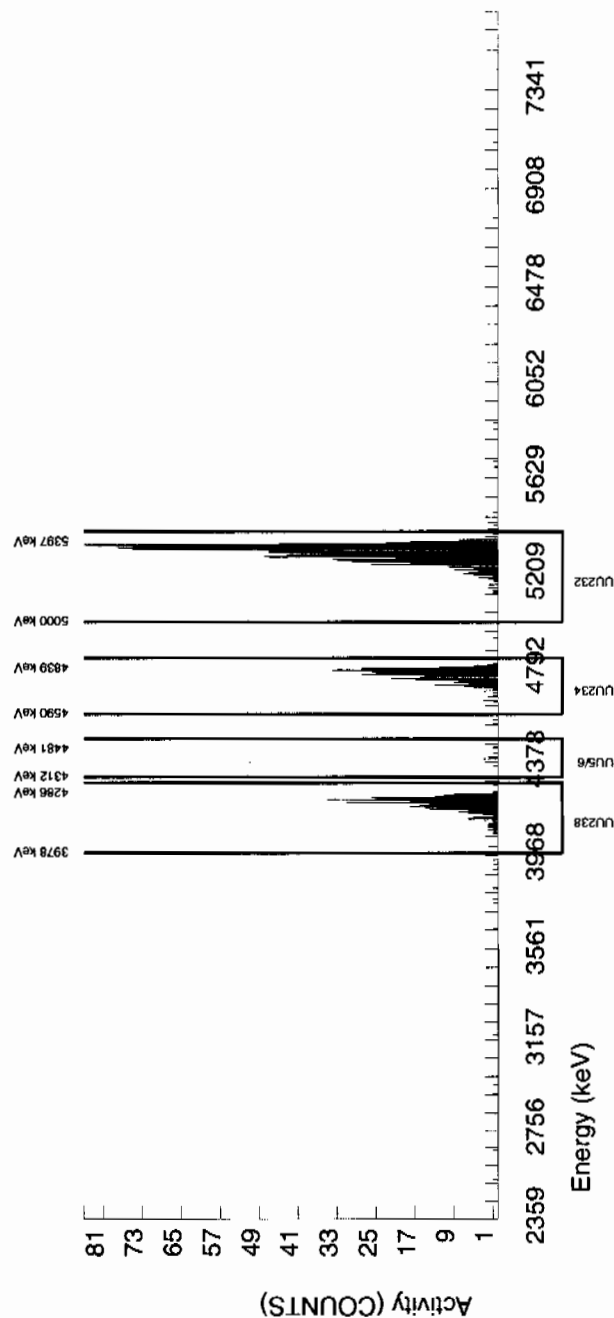
|   |  |  |
|---|--|--|
| TRACER<br>ID : 1283-H<br>NUCLIDE : U232<br>NOMINAL : 4.5034E+00 dpm<br>RESULTS : 3.8864E+00 dpm | MS/MSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G | LCS/LCSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G |
|---|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|----------|----------------|-------------|-----------|-----------|-----------|
| U232    | 5302.100       | 5310.148    | 54.878    | 1008.000   | 1006.000 | 2.000    | 1.4142 | 100.0000 | 3.99E+00       | 3.15E-01    | 1.30E-02  | 3.68E-02  | 1.26E-01  |
| U-3/4   | 4763.020       | 4768.432    | 52.853    | 372.000    | 370.981  | 0.000    | 5.4790 | 100.0000 | 1.47E+00       | 1.31E-01    | 5.05E-02  | 1.12E-01  | 7.62E-02  |
| U-235   | 4391.000       | 4408.800    | 13.606    | 10.000     | 10.000   | 0.000    | 2.4127 | 80.90000 | 4.89E-02       | 1.59E-02    | 2.75E-02  | 6.82E-02  | 1.55E-02  |
| U-238   | 4184.730       | 4195.466    | 43.428    | 354.000    | 354.000  | 0.000    | 3.6781 | 100.0000 | 1.40E+00       | 1.26E-01    | 3.39E-02  | 7.85E-02  | 7.45E-02  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of U232 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
U-3/4





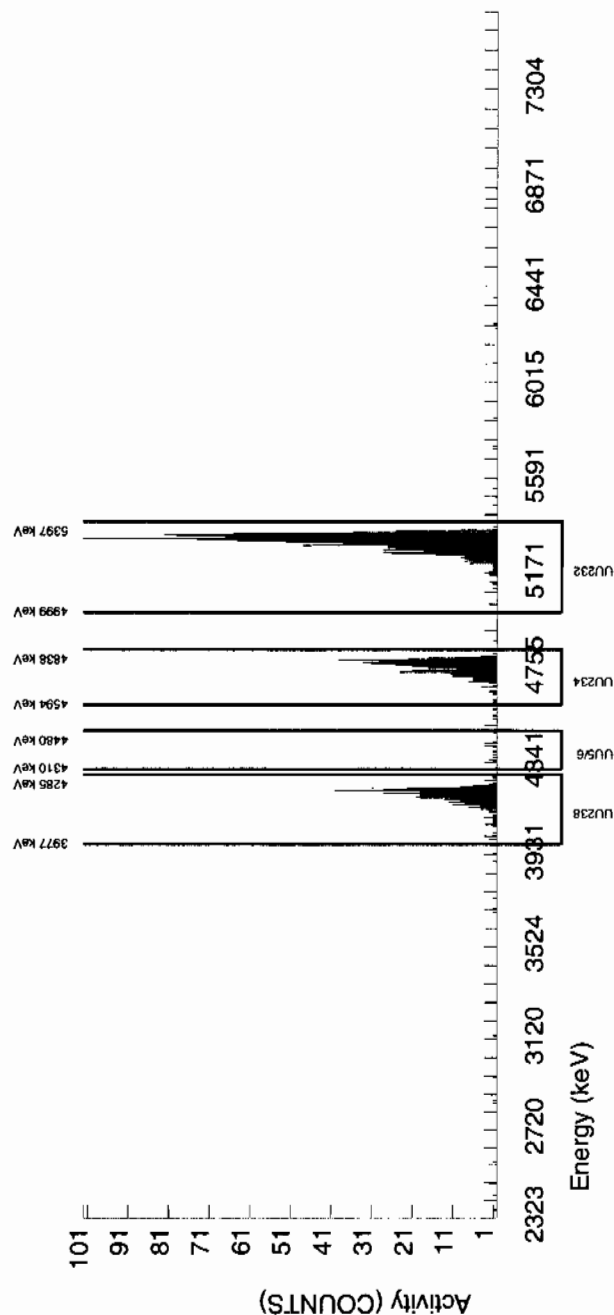
NOTES:

\* BKG Sg calculated via blank population.

Dr. Sg updated 8-MAR-2010)

\* BKG Sg of U232 calculated as sqrt(BKG AREA).

\* Corrections made to the following net area due to tracer impurity:



GEL Laboratories LLC  
ALPHA SPECTROSCOPY REPORT

|   |  |  |
|---|--|--|
| BATCH NUMBER : 962404<br>SAMPLE ID : S0247964003_UU<br>SAMPLE QTY : 0.512 G<br>SAMPLE DATE : 19-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 96.938 | CHAMBER : 121<br>DETECTOR S/N : 75545<br>AVERAGE %EFFICIENCY : 25.7929<br>COUNT DATE : 22-MAR-2010 21:19:50<br>ELAPSED LIVE TIME(SEC) : 60000.00 | LIB FILE : ENV_ALPHA_UU<br>BKG FILE : B121.CNF;457<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W121.CNF;121<br>CAL DATE : 19-MAR-2010 |
|---|--|--|

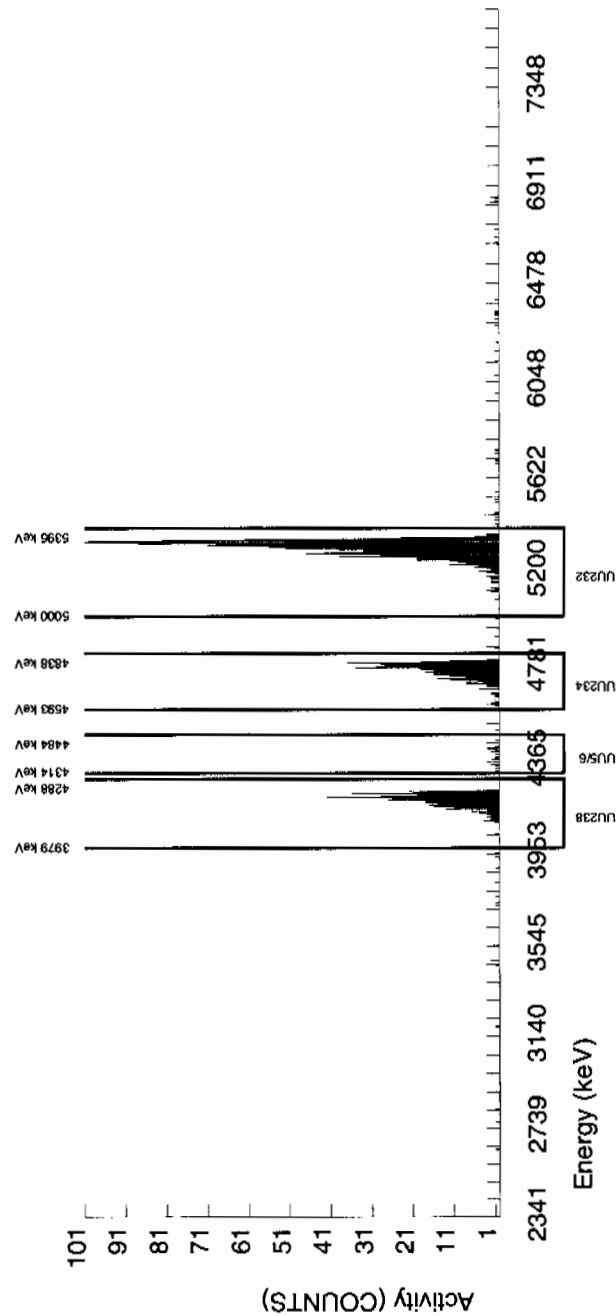
|   |  |  |
|---|--|--|
| TRACER<br>ID : 1283-H<br>NUCLIDE : U232<br>NOMINAL : 4.5034E+00 dpm<br>RESULTS : 4.3655E+00 dpm | MS/MSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G | LCS/LCSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G |
|---|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY<br>ENERGY | PEAK<br>ENERGY | PEAK<br>FWHM | GROSS<br>AREA | NET<br>AREA | BKG<br>AREA | BKG<br>Sg | %ABUN    | ACTIVITY<br>pCi/G | TPU<br>1-SIGMA | DLC<br>pCi/G | MDC<br>pCi/G | UNC<br>pCi/G |
|---------|-------------------|----------------|--------------|---------------|-------------|-------------|-----------|----------|-------------------|----------------|--------------|--------------|--------------|
| U232    | 5302.100          | 5310.668       | 41.347       | 1130.000      | 1125.000    | 5.000       | 2.2361    | 100.0000 | 3.96E+00          | 3.08E-01       | 1.83E-02     | 4.61E-02     | 1.19E-01     |
| U-3/4   | 4763.020          | 4765.537       | 38.282       | 401.000       | 398.860     | 1.000       | 5.4790    | 100.0000 | 1.40E+00          | 1.23E-01       | 4.49E-02     | 9.92E-02     | 7.04E-02     |
| U-235   | 4391.000          | 4394.713       | 79.057       | 23.000        | 22.000      | 1.000       | 2.4127    | 80.90000 | 9.57E-02          | 2.24E-02       | 2.44E-02     | 6.06E-02     | 2.13E-02     |
| U-238   | 4184.730          | 4196.824       | 41.123       | 400.000       | 398.000     | 2.000       | 3.6781    | 100.0000 | 1.40E+00          | 1.23E-01       | 3.01E-02     | 6.98E-02     | 7.05E-02     |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of U232 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area  
due to tracer impurity:  
U-3/4

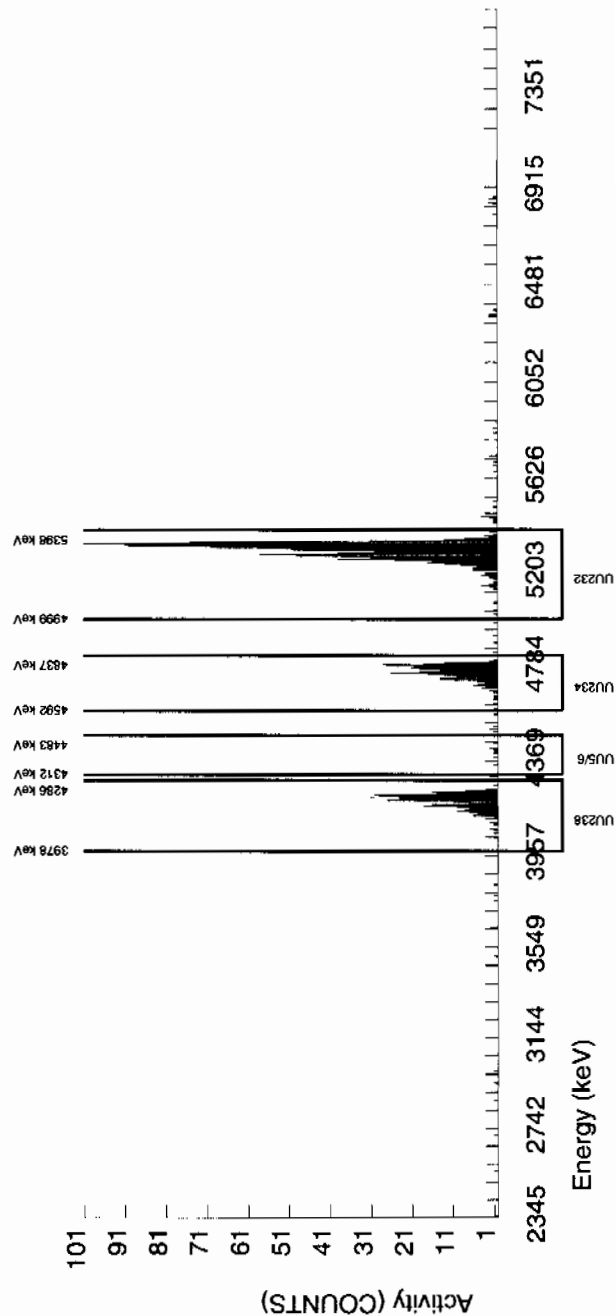


GEL Laboratories LLC  
ALPHA SPECTROSCOPY REPORT

|   |                |             |           |  |          |          |        |  |                |             |           |           |           |
|---|----------------|-------------|-----------|--|----------|----------|--------|--|----------------|-------------|-----------|-----------|-----------|
| BATCH NUMBER : 962404<br>SAMPLE ID : S0247964004_UU<br>SAMPLE QTY : 0.502 G<br>SAMPLE DATE : 19-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 95.804 |                |             |           | CHAMBER : 122<br>DETECTOR S/N : 75546<br>AVERAGE %EFFICIENCY : 26.3997<br>COUNT DATE : 22-MAR-2010 21:19:52<br>ELAPSED LIVE TIME(SEC) : 60000.00 |          |          |        | LIB FILE : ENV_ALPHA_UU<br>BKG FILE : B122.CNF;459<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W122.CNF;124<br>CAL DATE : 19-MAR-2010 |                |             |           |           |           |
| TRACER<br>ID : 1283-H<br>NUCLIDE : U232<br>NOMINAL : 4.5034E+00 dpm<br>RESULTS : 4.3145E+00 dpm   |                |             |           | MS/MSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G   |          |          |        | LCS/LCSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G   |                |             |           |           |           |
| NUCLIDE ACTIVITY SUMMARY  |                |             |           |  |          |          |        |  |                |             |           |           |           |
| NUCLIDE   | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA   | NET AREA | BKG AREA | BKG Sg | %ABUN  | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
| U232  | 5302.100       | 5310.083    | 61.046    | 1145.000   | 1138.000 | 7.000    | 2.6458 | 100.0000   | 4.04E+00       | 3.14E-01    | 2.18E-02  | 5.33E-02  | 1.21E-01  |
| U-3/4   | 4763.020       | 4765.635    | 65.586    | 329.000  | 326.847  | 1.000    | 5.4790 | 100.0000   | 1.16E+00       | 1.05E-01    | 4.52E-02  | 1.00E-01  | 6.43E-02  |
| U-235   | 4391.000       | 4410.427    | 7.271     | 11.000   | 10.000   | 1.000    | 2.4127 | 80.90000   | 4.39E-02       | 1.55E-02    | 2.46E-02  | 6.11E-02  | 1.52E-02  |
| U-238   | 4184.730       | 4199.471    | 54.778    | 356.000  | 356.000  | 0.000    | 3.6781 | 100.0000   | 1.26E+00       | 1.13E-01    | 3.04E-02  | 7.03E-02  | 6.69E-02  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of U232 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area  
due to tracer impurity:  
U-3/4



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|   |  |  |
|---|--|--|
| <p>BATCH NUMBER : 962404<br/>SAMPLE ID : S0247964005_UU<br/>SAMPLE QTY : 0.501 G<br/>SAMPLE DATE : 19-FEB-2010 00:00:00<br/>ANALYST : JXH2<br/>% YIELD : 97.181</p> | <p>CHAMBER : 123<br/>DETECTOR S/N : 45-142V3<br/>AVERAGE %EFFICIENCY : 27.2378<br/>COUNT DATE : 22-MAR-2010 21:19:55<br/>ELAPSED LIVE TIME(SEC) : 60000.00</p> | <p>LIB FILE : ENV_ALPHA_UU<br/>BKG FILE : B123.CNF;457<br/>BKG DATE : 21-MAR-2010<br/>BKG LIVE TIME(SEC) : 60000.00<br/>EFF FILE : W123.CNF;120<br/>CAL DATE : 19-MAR-2010</p> |
|---|--|--|

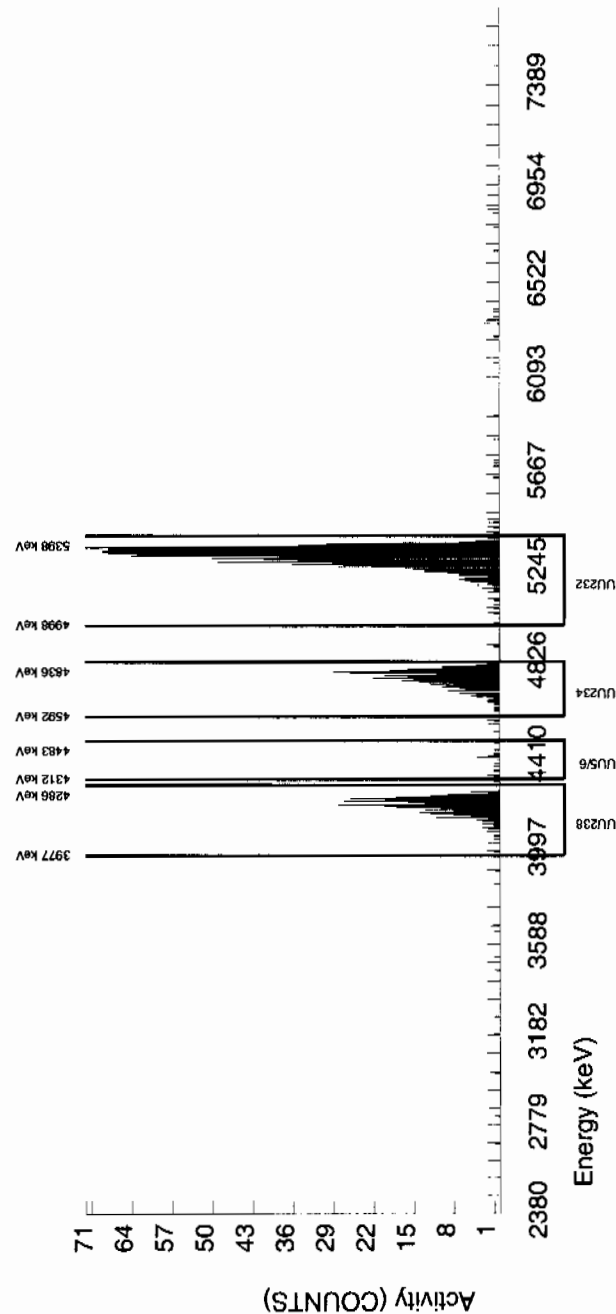
|  |  |  |
|--|--|--|
| <p>TRACER<br/>ID : 1283-H<br/>NUCLIDE : U232<br/>NOMINAL : 4.5034E+00 dpm<br/>RESULTS : 4.3765E+00 dpm</p> | <p>MS/MSD<br/>ID : 0244-A<br/>NUCLIDE : U-238<br/>NOMINAL : 5.7500E+00 pCi/G</p> | <p>LCS/LCSD<br/>ID : 0244-A<br/>NUCLIDE : U-238<br/>NOMINAL : 5.7500E+00 pCi/G</p> |
|--|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|----------|----------------|-------------|-----------|-----------|-----------|
| U232    | 5302.100       | 5310.119    | 72.743    | 1196.000   | 1191.000 | 5.000    | 2.2361 | 100.0000 | 4.05E+00       | 3.12E-01    | 1.77E-02  | 4.45E-02  | 1.18E-01  |
| U-3/4   | 4763.020       | 4763.166    | 59.073    | 365.000    | 363.794  | 0.000    | 5.4790 | 100.0000 | 1.24E+00       | 1.10E-01    | 4.33E-02  | 9.58E-02  | 6.48E-02  |
| U-235   | 4391.000       | 4400.034    | 8.239     | 18.000     | 17.000   | 1.000    | 2.4127 | 80.90000 | 7.14E-02       | 1.90E-02    | 2.36E-02  | 5.85E-02  | 1.83E-02  |
| U-238   | 4184.730       | 4197.771    | 50.382    | 355.000    | 354.000  | 1.000    | 3.6781 | 100.0000 | 1.20E+00       | 1.07E-01    | 2.91E-02  | 6.73E-02  | 6.41E-02  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of U232 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
U-3/4



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|   |  |  |
|---|--|--|
| BATCH NUMBER : 962404<br>SAMPLE ID : S0247970001_UU<br>SAMPLE QTY : 0.513 G<br>SAMPLE DATE : 23-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 98.887 | CHAMBER : 136<br>DETECTOR S/N : 80006<br>AVERAGE %EFFICIENCY : 26.8353<br>COUNT DATE : 22-MAR-2010 21:20:18<br>ELAPSED LIVE TIME(SEC) : 60000.00 | LIB FILE : ENV_ALPHA_UU<br>BKG FILE : B136.CNF:455<br>BKG DATE : 21-MAR-2010<br>BKG LIVE TIME(SEC) : 60000.00<br>EFF FILE : W136.CNF:143<br>CAL DATE : 18-MAR-2010 |
|---|--|--|

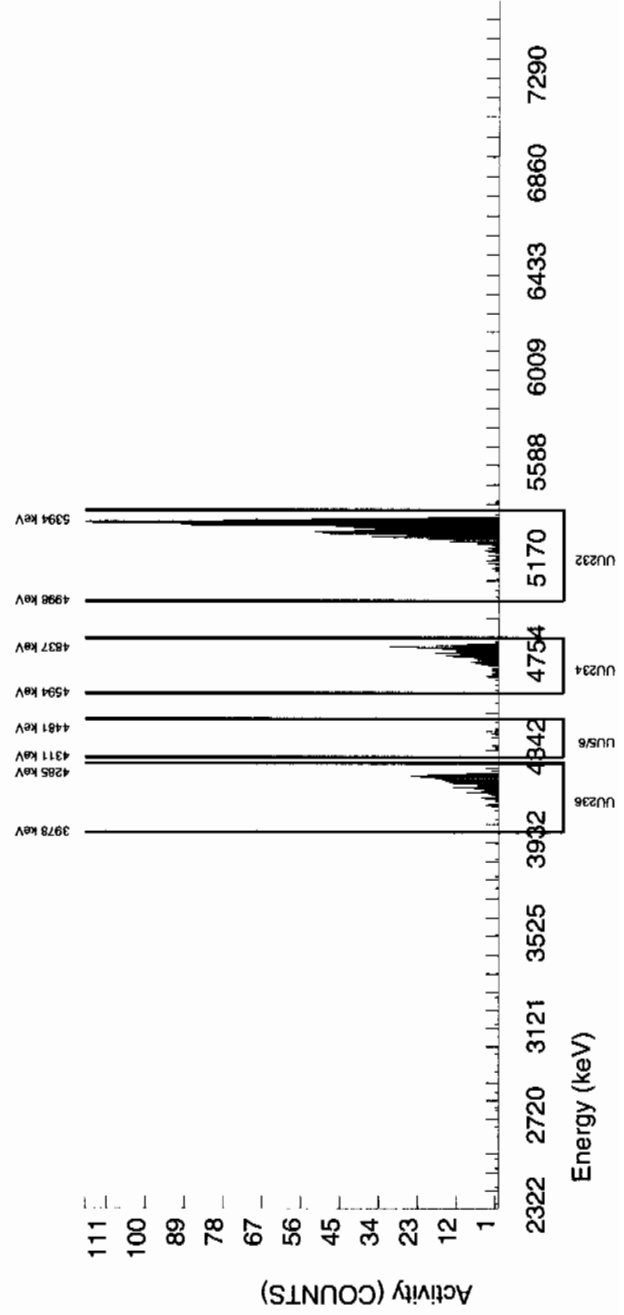
|   |  |  |
|---|--|--|
| TRACER<br>ID : 1283-H<br>NUCLIDE : U232<br>NOMINAL : 4.5029E+00 dpm<br>RESULTS : 4.4528E+00 dpm | MS/MSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G | LCS/LCSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G |
|---|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|----------|----------------|-------------|-----------|-----------|-----------|
| U232    | 5302.100       | 5322.092    | 32.103    | 1195.000   | 1194.000 | 1.000    | 1.0000 | 100.0000 | 3.95E+00       | 3.05E-01    | 7.70E-03  | 2.44E-02  | 1.15E-01  |
| U-3/4   | 4763.020       | 4771.848    | 37.558    | 259.000    | 257.790  | 0.000    | 5.4790 | 100.0000 | 8.53E-01       | 8.08E-02    | 4.22E-02  | 9.33E-02  | 5.31E-02  |
| U-235   | 4391.000       | 4408.228    | 64.465    | 14.000     | 13.000   | 1.000    | 2.4127 | 80.90000 | 5.32E-02       | 1.63E-02    | 2.30E-02  | 5.70E-02  | 1.58E-02  |
| U-238   | 4184.730       | 4201.524    | 57.911    | 247.000    | 246.000  | 1.000    | 3.6781 | 100.0000 | 8.14E-01       | 7.81E-02    | 2.83E-02  | 6.56E-02  | 5.21E-02  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of U232 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
U-3/4



**GEL Laboratories LLC**  
**ALPHA SPECTROSCOPY REPORT**

|                |                      |                          |                      |                      |               |
|----------------|----------------------|--------------------------|----------------------|----------------------|---------------|
| BATCH NUMBER : | 962404               | CHAMBER :                | 009                  | LIB FILE :           | ENV_ALPHA_UU  |
| SAMPLE ID :    | S1202064509_UU       | DETECTOR S/N :           | 72528                | BKG FILE :           | B009.CNF;1114 |
| SAMPLE QTY :   | 1.000 G              | AVERAGE %EFFICIENCY :    | 34.3260              | BKG DATE :           | 14-MAR-2010   |
| SAMPLE DATE :  | 15-MAR-2010 00:00:00 | COUNT DATE :             | 20-MAR-2010 12:43:04 | BKG LIVE TIME(SEC) : | 59999.99      |
| ANALYST :      | JXH2                 | ELAPSED LIVE TIME(SEC) : | 59999.99             | EFF FILE :           | W009.CNF;309  |
| % YIELD :      | 103.588              |                          |                      | CAL DATE :           | 4-MAR-2010    |

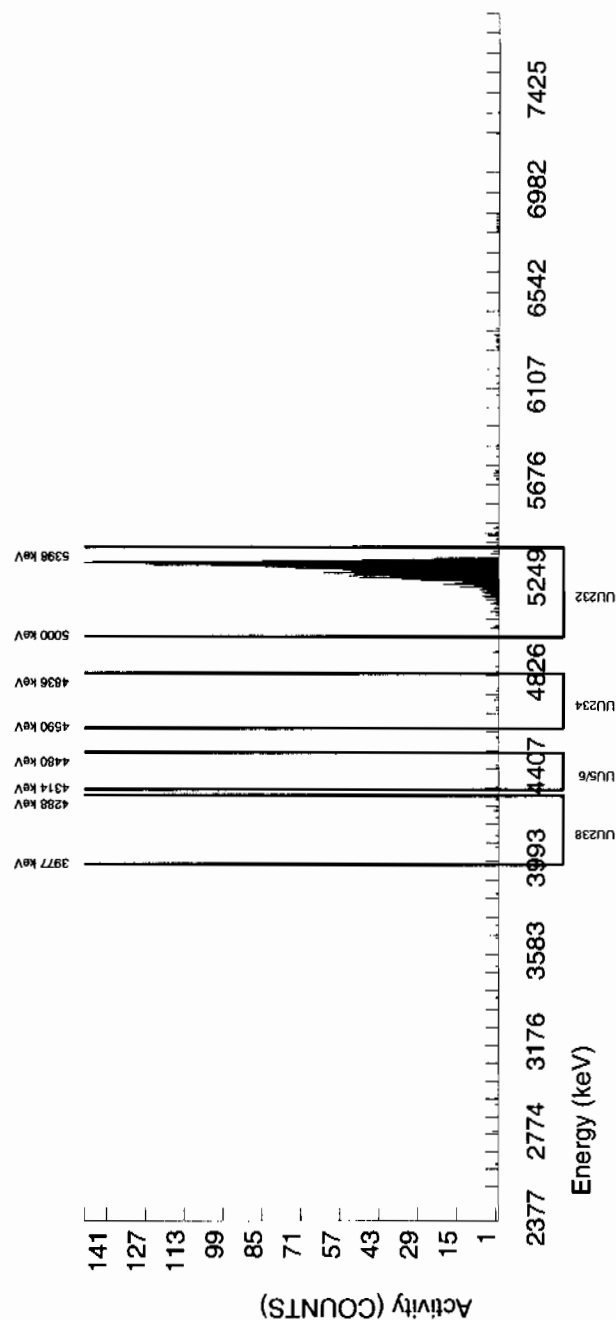
|                          |                            |                            |
|--------------------------|----------------------------|----------------------------|
| TRACER                   | MS/MSD                     | LCS/LCSD                   |
| ID : 1283-H              | ID : 0244-A                | ID : 0244-A                |
| NUCLIDE : U232           | NUCLIDE : U-238            | NUCLIDE : U-238            |
| NOMINAL : 4.5005E+00 dpm | NOMINAL : 5.7500E+00 pCi/G | NOMINAL : 5.7500E+00 pCi/G |

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN    | ACTIVITY pCi/g | TPU 1-SIGMA | DLC pCi/g | MDC pCi/g | UNC pCi/g |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|----------|----------------|-------------|-----------|-----------|-----------|
| U-232   | 5302.100       | 5303.655    | 34.860    | 1606.000   | 1600.000 | 6.000    | 2.4495 | 100.0000 | 2.03E+00       | 1.50E-01    | 7.22E-03  | 1.79E-02  | 5.09E-02  |
| U-3/4   | 4763.020       | 4726.146    | 4.946     | 7.000      | 5.379    | 0.000    | 5.4790 | 100.0000 | 6.81E-03       | 2.98E-03    | 1.61E-02  | 3.57E-02  | 2.94E-03  |
| U-235   | 4391.000       | 4373.485    | 0.000     | 4.000      | 1.000    | 3.000    | 2.4127 | 80.90000 | 1.57E-03       | 4.14E-03    | 8.79E-03  | 2.18E-02  | 4.14E-03  |
| U-238   | 4184.730       | 4166.417    | 4.946     | 10.000     | 9.000    | 1.000    | 3.6781 | 100.0000 | 1.14E-02       | 4.28E-03    | 1.08E-02  | 2.51E-02  | 4.20E-03  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of U232 calculated as  $\sqrt{\text{BKG AREA}}$ .
- \* Corrections made to the following net area  
due to tracer impurity:  
U-3/4

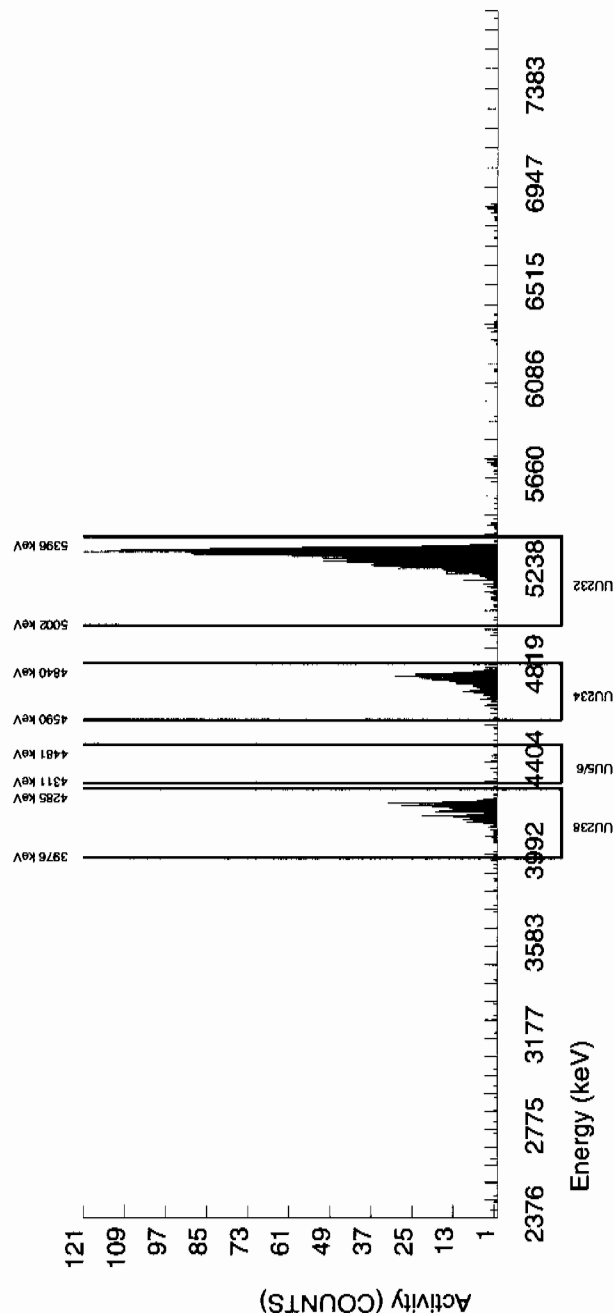


GEL Laboratories LLC  
ALPHA SPECTROSCOPY REPORT

|   |                |             |           |  |          |          |        |  |                |             |           |           |           |
|---|----------------|-------------|-----------|--|----------|----------|--------|--|----------------|-------------|-----------|-----------|-----------|
| BATCH NUMBER : 962404<br>SAMPLE ID : S1202064510_UU<br>SAMPLE QTY : 0.504 G<br>SAMPLE DATE : 23-FEB-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 96.914 |                |             |           | CHAMBER : 010<br>DETECTOR S/N : 72529<br>AVERAGE %EFFICIENCY : 31.3468<br>COUNT DATE : 20-MAR-2010 12:43:04<br>ELAPSED LIVE TIME(SEC) : 59999.99 |          |          |        | LIB FILE : ENV_ALPHA_UU<br>BKG FILE : B010.CNF.1132<br>BKG DATE : 14-MAR-2010<br>BKG LIVE TIME(SEC) : 59999.99<br>EFF FILE : W010.CNF.337<br>CAL DATE : 4-MAR-2010 |                |             |           |           |           |
| TRACER<br>ID : 1283-H<br>NUCLIDE : U232<br>NOMINAL : 4.5029E+00 dpm<br>RESULTS : 4.3640E+00 dpm   |                |             |           | MS/MSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G   |          |          |        | LCS/LCSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G   |                |             |           |           |           |
| NUCLIDE ACTIVITY SUMMARY  |                |             |           |  |          |          |        |  |                |             |           |           |           |
| NUCLIDE   | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA   | NET AREA | BKG AREA | BKG Sg | %ABUN  | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
| U232  | 5302.100       | 5308.689    | 38.622    | 1374.000   | 1367.000 | 7.000    | 2.6458 | 100.0000   | 4.02E+00       | 3.05E-01    | 1.81E-02  | 4.42E-02  | 1.09E-01  |
| U-3/4   | 4763.020       | 4761.481    | 33.851    | 304.000  | 298.615  | 4.000    | 5.4790 | 100.0000   | 8.79E-01       | 8.07E-02    | 3.75E-02  | 8.30E-02  | 5.15E-02  |
| U-235   | 4391.000       | 4393.729    | 121.638   | 15.000   | 13.000   | 2.000    | 2.4127 | 80.90000   | 4.73E-02       | 1.54E-02    | 2.04E-02  | 5.07E-02  | 1.50E-02  |
| U-238   | 4184.730       | 4187.443    | 61.558    | 332.000  | 331.000  | 1.000    | 3.6781 | 100.0000   | 9.74E-01       | 8.73E-02    | 2.52E-02  | 5.83E-02  | 5.37E-02  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of U232 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
U-3/4



# GEL Laboratories LLC ALPHA SPECTROSCOPY REPORT

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| BATCH NUMBER : 962404<br>SAMPLE ID : S1202064511_UU<br>SAMPLE QTY : 0.101 G<br>SAMPLE DATE : 15-MAR-2010 00:00:00<br>ANALYST : JXH2<br>% YIELD : 73.973 |  | CHAMBER : 011<br>DETECTOR S/N : 72531<br>AVERAGE %EFFICIENCY : 31.2445<br>COUNT DATE : 20-MAR-2010 12:43:04<br>ELAPSED LIVE TIME(SEC) : 59999.99 |  | LIB FILE : ENV_ALPHA_UU<br>BKG FILE : B011.CNF;1124<br>BKG DATE : 14-MAR-2010<br>BKG LIVE TIME(SEC) : 59999.99<br>EFF FILE : W011.CNF;315<br>CAL DATE : 4-MAR-2010 |  |
|---|--|--|--|--|--|

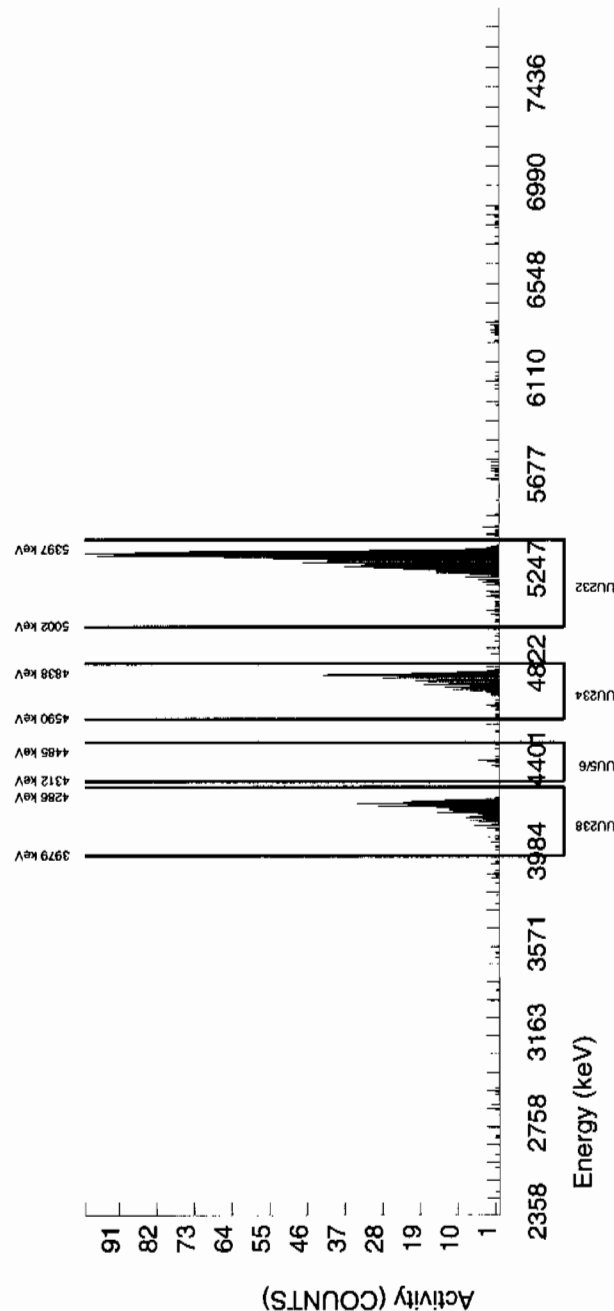
|   |  |  |
|---|--|--|
| TRACER<br>ID : 1283-H<br>NUCLIDE : U232<br>NOMINAL : 4.5005E+00 dpm<br>RESULTS : 3.3291E+00 dpm | MS/MSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G | LCS/LCSD<br>ID : 0244-A<br>NUCLIDE : U-238<br>NOMINAL : 5.7500E+00 pCi/G |
|---|--|--|

## NUCLIDE ACTIVITY SUMMARY

| NUCLIDE | LIBRARY ENERGY | PEAK ENERGY | PEAK FWHM | GROSS AREA | NET AREA | BKG AREA | BKG Sg | %ABUN    | ACTIVITY pCi/G | TPU 1-SIGMA | DLC pCi/G | MDC pCi/G | UNC pCi/G |
|---------|----------------|-------------|-----------|------------|----------|----------|--------|----------|----------------|-------------|-----------|-----------|-----------|
| U232    | 5302.100       | 5309.529    | 33.915    | 1050.000   | 1040.000 | 10.000   | 3.1623 | 100.0000 | 2.01E+01       | 1.70E+00    | 1.42E-01  | 3.36E-01  | 6.28E-01  |
| U-3/4   | 4763.020       | 4767.510    | 26.968    | 350.000    | 347.947  | 1.000    | 5.4790 | 100.0000 | 6.71E+00       | 6.41E-01    | 2.48E-01  | 5.44E-01  | 3.61E-01  |
| U-235   | 4391.000       | 4418.509    | 5.584     | 15.000     | 15.000   | 0.000    | 2.4127 | 80.90000 | 3.58E-01       | 9.66E-02    | 1.34E-01  | 3.32E-01  | 9.24E-02  |
| U-238   | 4184.730       | 4191.930    | 26.664    | 289.000    | 286.000  | 3.000    | 3.6781 | 100.0000 | 5.52E+00       | 5.46E-01    | 1.65E-01  | 3.83E-01  | 3.30E-01  |

## NOTES:

- \* BKG Sg calculated via blank population.  
(Sg updated 8-MAR-2010)
- \* BKG Sg of U232 calculated as sqrt(BKG AREA).
- \* Corrections made to the following net area due to tracer impurity:  
U-3/4





# Radiochemistry Batch Checklist, Rev10

Batch# 958216 Product: 8-5 Date: 3/16/10

| Criteria:   | Yes | No | Comments |
|---|-----|----|----------|
| Sample Solids are less than or equal to 100 mg for GAB.   |     |    | NA       |
| Samples have been blank corrected (if required)   |     |    | NA       |
| If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.   | ✓   |    |          |
| Instrument source check is within limits.   | ✓   |    |          |
| Instrument bkg check is within limits.  | ✓   |    |          |
| Method RDL/ LLD has been met.   | ✓   |    |          |
| If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%. Or meets the client's required RER acceptance criteria. | ✓   |    |          |
| Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.  |     |    | NA       |
| Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)   | ✓   |    |          |
| Sample was run within hold time.  | ✓   |    |          |
| Sample was correctly preserved if required.   |     |    | NA       |
| Smears Taken for Radioactive batches.   |     |    | NA       |
| Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.   | ✓   |    |          |
| No blank spaces on data forms.  | ✓   |    |          |
| All line outs initialed and dated.  | ✓   |    |          |
| No transcription errors are apparent.   |     |    |          |
| Aux data is correct.  |     |    | NA       |
| Client Special requirements page has been checked.  | ✓   |    |          |
| Raw Data and/ or spectrum are included and properly statused.   | ✓   |    |          |
| QC data entered into QC database and batch is in REVW   | ✓   |    |          |
| Hit notification complete (if necessary)  |     |    | NA       |
| Batch entered into Case Narrative.  | ✓   |    |          |
| Batch Data Exception Reports (DER) completed, if applicable.  |     |    | NA       |
| Batch Data Exception Reports (DER) second reviewed and disposition verified to be completed.  |     |    | NA       |
| Aliquot Correction completed if required.   |     |    | NA       |
| Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)  | ✓   |    |          |

GEL Laboratories, LLC

RADchecklistrev10, revised 1/13/2010

Primary Review Performed By: K Ost 3/16/10

Secondary Review Performed By: gi Hantz 3/18/10

LANL

3/25

# Gamma Spec Que Sheet

1.6-3/9/10

02/26/2010

Batch #: 958216 Analyst: MXR1 First Client Due Date: 03/14/2010 Internal Due Date: 03/14/2010  
 Gamma Spike Isotope: Mixed Gamma Spike Code: NA Expiration Date: NA Vol: NA Nominal Concentration: NA Co-60 6.347  
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1032-A Expiration Date: 12/2/10 Vol: 1.0mL Nominal Concentration: CS-137 5.552 Am-241 15.90  
 Initials: MS Prep Date: 3/2/10 Library: SOLID Witness: NA

| Sample ID    | Client Description / Container ID | Hazard Code | Type   | Client     | Matrix | Collect Date       | Geometry | Detector | Sealing Date/Time (if Applicable) |
|--------------|-----------------------------------|-------------|--------|------------|--------|--------------------|----------|----------|-----------------------------------|
| 247964001-1  | RE36-10-8489                      |             | SAMPLE | LANL010    | SOIL   | 19-FEB-10 12:00:00 | CCW      | 136.53   | 16                                |
| 247964002-1  | RE36-10-8486                      |             | SAMPLE | LANL010    | SOIL   | 19-FEB-10 12:00:00 | CC       | 134.67   | 25                                |
| 247964003-1  | RE36-10-8487                      |             | SAMPLE | LANL010    | SOIL   | 19-FEB-10 12:00:00 | CC       | 132.37   | 5                                 |
| 247964004-1  | RE36-10-8462                      |             | SAMPLE | LANL010    | SOIL   | 19-FEB-10 12:00:00 | CC       | 142.62   | 13                                |
| 247964005-1  | RE36-10-8463                      |             | SAMPLE | LANL010    | SOIL   | 19-FEB-10 12:00:00 | CC       | 123.99   | 15                                |
| 247969001-1  | RE36-10-8490                      |             | SAMPLE | LANL010    | SOIL   | 20-FEB-10 12:00:00 | CC       | 124.41   | 18                                |
| 247969002-1  | RE36-10-8470                      |             | SAMPLE | LANL010    | SOIL   | 20-FEB-10 12:00:00 | CC       | 136.19   | 21                                |
| 247969003-1  | RE36-10-8476                      |             | SAMPLE | LANL010    | SOIL   | 20-FEB-10 12:00:00 | CC       | 130.99   | 22                                |
| 247969004-1  | RE36-10-8480                      |             | SAMPLE | LANL010    | SOIL   | 20-FEB-10 12:00:00 | CC       | 118.10   | 23                                |
| 247969005-1  | RE36-10-8474                      |             | SAMPLE | LANL010    | SOIL   | 20-FEB-10 12:00:00 | CC       | 128.63   | 16                                |
| 247969006-1  | RE36-10-8478                      |             | SAMPLE | LANL010    | SOIL   | 20-FEB-10 12:00:00 | CC       | 136.18   | 23                                |
| 247969007-1  | RE36-10-8483                      |             | SAMPLE | LANL010    | SOIL   | 20-FEB-10 12:00:00 | CC       | 120.15   | 11                                |
| 247969008-1  | RE36-10-8482                      |             | SAMPLE | LANL010    | SOIL   | 20-FEB-10 12:00:00 | CC       | 127.15   | 17                                |
| 247970001-1  | RE46-10-13181                     |             | SAMPLE | LANL010    | SOIL   | 23-FEB-10 12:00:00 | CC       | 124.98   | 18                                |
| 247970002-1  | RE46-10-13178                     |             | SAMPLE | LANL010    | SOIL   | 23-FEB-10 12:00:00 | CC       | 105.49   | 21                                |
| 247970003-1  | RE46-10-13179                     |             | SAMPLE | LANL010    | SOIL   | 23-FEB-10 12:00:00 | CC       | 121.97   | 15                                |
| 247970004-1  | RE46-10-13180                     |             | SAMPLE | LANL010    | SOIL   | 23-FEB-10 12:00:00 | CC       | 141.41   | 5                                 |
| 247970005-1  | RE46-10-13177                     |             | SAMPLE | LANL010    | SOIL   | 23-FEB-10 12:00:00 | CC       | 127.80   | 4                                 |
| 247970006-1  | RE46-10-13176                     |             | SAMPLE | LANL010    | SOIL   | 23-FEB-10 12:00:00 | CC       | 127.94   | 6                                 |
| 247970007-1  | RE46-10-13182                     |             | SAMPLE | LANL010    | SOIL   | 23-FEB-10 12:00:00 | CC       | 140.53   | 14                                |
| 1202054948-1 | MB                                |             | MB     | QC ACCOUNT | SOIL   | 3/2/10             | CC       | 142.42   | 20                                |
| 1202054949-1 | DUP RE46-10-13181(247970001)      |             | DUP    | QC ACCOUNT | SOIL   | 3/2/10             | CC       | 126.98   | 23                                |
| 1202054950-1 | LCS                               |             | LCS    | QC ACCOUNT | SOIL   | 3/2/10             | CC       | 155.44   | 21                                |

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: KOat 3/10/10

✓ no history  
✓ initials

# Failed RDL Report

| Batch Id | Samp Id   | Sample Type | Run Date  | YIELD | Parmname      | Result   | MDA     | RDL   |
|----------|-----------|-------------|-----------|-------|---------------|----------|---------|-------|
| 958216   | 247964001 | SAMPLE      | 10-MAR-10 |       | Americium-241 | 0.04472  | 0.2657  | 0.200 |
|          |           |             |           |       | Cesium-134    | 0.1016   | 0.103   | 0.100 |
|          |           |             |           |       | Thorium-234   | 1.4      | 2.445   | 2.00  |
| 958216   | 247964002 | SAMPLE      | 10-MAR-10 |       | Sodium-22     | -0.00188 | 0.08876 | 0.080 |
| 958216   | 247964003 | SAMPLE      | 10-MAR-10 |       |               |          |         |       |
| 958216   | 247964004 | SAMPLE      | 10-MAR-10 |       |               |          |         |       |
| 958216   | 247964005 | SAMPLE      | 10-MAR-10 |       | Americium-241 | 0.2955   | 0.4242  | 0.200 |
|          |           |             |           |       | Cerium-139    | -0.01395 | 0.05323 | 0.050 |
| 958216   | 247969001 | SAMPLE      | 10-MAR-10 |       | Americium-241 | 0.08054  | 0.2299  | 0.200 |
| 958216   | 247969002 | SAMPLE      | 10-MAR-10 |       |               |          |         |       |
| 958216   | 247969003 | SAMPLE      | 10-MAR-10 |       |               |          |         |       |
| 958216   | 247969004 | SAMPLE      | 10-MAR-10 |       | Americium-241 | 0.0732   | 0.2771  | 0.200 |
|          |           |             |           |       | Thorium-234   | 2.205    | 2.299   | 2.00  |
| 958216   | 247969005 | SAMPLE      | 10-MAR-10 |       |               |          |         |       |
| 958216   | 247969006 | SAMPLE      | 11-MAR-10 |       | Americium-241 | -0.1318  | 0.3792  | 0.200 |
|          |           |             |           |       | Cerium-139    | 0.02272  | 0.05935 | 0.050 |
|          |           |             |           |       | Cesium-134    | 0.07783  | 0.1018  | 0.100 |
|          |           |             |           |       | Thorium-234   | 0.4476   | 3.335   | 2.00  |
| 958216   | 247969007 | SAMPLE      | 11-MAR-10 |       |               |          |         |       |
| 958216   | 247969008 | SAMPLE      | 11-MAR-10 |       | Cerium-139    | 0.00995  | 0.06182 | 0.050 |
|          |           |             |           |       | Ruthenium-106 | 0.3991   | 0.8171  | 0.800 |
|          |           |             |           |       | Sodium-22     | -0.04738 | 0.101   | 0.080 |
| 958216   | 247970001 | SAMPLE      | 11-MAR-10 |       | Americium-241 | 0.05609  | 0.3006  | 0.200 |
|          |           |             |           |       | Thorium-234   | 1.508    | 2.672   | 2.00  |
| 958216   | 247970002 | SAMPLE      | 11-MAR-10 |       | Cerium-139    | 0.00202  | 0.05024 | 0.050 |
|          |           |             |           |       | Sodium-22     | -0.03019 | 0.1207  | 0.080 |
|          |           |             |           |       | Yttrium-88    | 0.06435  | 0.1263  | 0.100 |
| 958216   | 247970003 | SAMPLE      | 11-MAR-10 |       | Americium-241 | -0.256   | 0.568   | 0.200 |
|          |           |             |           |       | Cerium-139    | 0.0044   | 0.06955 | 0.050 |
|          |           |             |           |       | Cesium-134    | 0.08875  | 0.1135  | 0.100 |
|          |           |             |           |       | Europium-152  | 0.01784  | 0.2223  | 0.200 |
|          |           |             |           |       | Sodium-22     | 0.00056  | 0.08376 | 0.080 |
|          |           |             |           |       | Thorium-234   | 1.526    | 4.667   | 2.00  |
|          |           |             |           |       | Tin-113       | -0.02793 | 0.101   | 0.100 |
| 958216   | 247970004 | SAMPLE      | 11-MAR-10 |       | Cerium-139    | 0.00606  | 0.05161 | 0.050 |
|          |           |             |           |       | Cesium-134    | 0.07622  | 0.1014  | 0.100 |
|          |           |             |           |       | Sodium-22     | 0.0091   | 0.08522 | 0.080 |
| 958216   | 247970005 | SAMPLE      | 11-MAR-10 |       | Americium-241 | 0.01921  | 0.4004  | 0.200 |
|          |           |             |           |       | Cesium-134    | 0.07937  | 0.1047  | 0.100 |
|          |           |             |           |       | Thorium-234   | 1.604    | 3.359   | 2.00  |
| 958216   | 247970006 | SAMPLE      | 11-MAR-10 |       | Americium-241 | 0.1328   | 0.3253  | 0.200 |
|          |           |             |           |       | Cerium-139    | 0.0179   | 0.06147 | 0.050 |
|          |           |             |           |       | Cesium-134    | 0.06809  | 0.1039  | 0.100 |

# Failed RDL Report

| Batch Id | Samp Id    | Sample Type | Run Date  | YIELD | Parmname      | Result   | MDA     | RDL   |
|----------|------------|-------------|-----------|-------|---------------|----------|---------|-------|
| 958216   | 247970006  | SAMPLE      | 11-MAR-10 |       | Sodium-22     | -0.04743 | 0.08982 | 0.080 |
|          |            |             |           |       | Thorium-234   | 2.526    | 2.77    | 2.00  |
| 958216   | 247970007  | SAMPLE      | 11-MAR-10 |       | Americium-241 | 0.0473   | 0.2234  | 0.200 |
|          |            |             |           |       | Cerium-139    | 0.01913  | 0.05083 | 0.050 |
| 958216   | 1202054948 | MB          | 11-MAR-10 |       |               |          |         |       |
| 958216   | 1202054949 | DUP         | 11-MAR-10 |       | Americium-241 | -0.3284  | 0.3767  | 0.200 |
|          |            |             |           |       | Cerium-139    | 0.00328  | 0.05868 | 0.050 |
|          |            |             |           |       | Cesium-134    | 0.09409  | 0.1017  | 0.100 |
|          |            |             |           |       | Sodium-22     | -0.03138 | 0.09119 | 0.080 |
|          |            |             |           |       | Thorium-234   | 2.302    | 3.408   | 2.00  |
| 958216   | 1202054950 | LCS         | 11-MAR-10 |       | Cerium-139    | 0.01255  | 0.0718  | 0.050 |
|          |            |             |           |       | Cesium-134    | -0.0112  | 0.1878  | 0.100 |
|          |            |             |           |       | Europium-152  | -0.02551 | 0.3101  | 0.200 |
|          |            |             |           |       | Potassium-40  | 1.284    | 1.452   | 1.00  |
|          |            |             |           |       | Ruthenium-106 | 0.02799  | 1.079   | 0.800 |
|          |            |             |           |       | Tin-113       | -0.03664 | 0.1427  | 0.100 |
|          |            |             |           |       | Yttrium-88    | 0.03418  | 0.119   | 0.100 |

# GEL QUALS

Batch ID: 958216

Report run on: March 16, 2010 2:07 PM

| Samp Id                          | Parmname      | Cofa | Edd | Qual Comments                       | Auto | Result | MDA | Uncert | SQL |
|----------------------------------|---------------|------|-----|-------------------------------------|------|--------|-----|--------|-----|
| 247964001-1<br>10-MAR-2010 21:17 | Bismuth-211   | UI   | UI  | Data rejected due to interference.  |      | 6.262  |     |        |     |
|                                  | Cadmium-109   | UI   | UI  | Data rejected due to interference.  |      | 5.435  |     |        |     |
|                                  | Mercury-203   | UI   | UI  | Data rejected due to interference.  |      | .08283 |     | .1     | .1  |
|                                  | Radium-224    | UI   | UI  | Data rejected due to interference.  |      | 8.17   |     |        |     |
|                                  | Uranium-235   | UI   | UI  | Data rejected due to no valid peak. |      | .3896  |     | .5     | .5  |
| 247964002-1<br>10-MAR-2010 21:17 | Bismuth-211   | UI   | UI  | Data rejected due to interference.  |      | 6.736  |     |        |     |
|                                  | Cadmium-109   | UI   | UI  | Data rejected due to interference.  |      | 5.997  |     |        |     |
|                                  | Cesium-134    | UI   | UI  | Data rejected due to low abundance. |      | .1372  |     | .1     | .1  |
|                                  | Radium-224    | UI   | UI  | Data rejected due to interference.  |      | 7.928  |     |        |     |
| 247964003-1<br>10-MAR-2010 23:08 | Americium-241 | UI   | UI  | Data rejected due to low abundance. |      | .1155  |     | .2     | .2  |
|                                  | Bismuth-211   | UI   | UI  | Data rejected due to interference.  |      | 6.257  |     |        |     |
|                                  | Cadmium-109   | UI   | UI  | Data rejected due to interference.  |      | 5.88   |     |        |     |
|                                  | Cesium-134    | UI   | UI  | Data rejected due to low abundance. |      | .1306  |     | .1     | .1  |
|                                  | Radium-224    | UI   | UI  | Data rejected due to interference.  |      | 7.224  |     |        |     |
|                                  | Strontium-85  | UI   | UI  | Data rejected due to low abundance. |      | .08304 |     |        |     |
| 247964004-1<br>10-MAR-2010 23:09 | Bismuth-211   | UI   | UI  | Data rejected due to interference.  |      | 5.597  |     |        |     |
|                                  | Cadmium-109   | UI   | UI  | Data rejected due to interference.  |      | 4.957  |     |        |     |
|                                  | Cesium-134    | UI   | UI  | Data rejected due to low abundance. |      | .1723  |     | .1     | .1  |
|                                  | Radium-224    | UI   | UI  | Data rejected due to interference.  |      | 5.46   |     |        |     |
|                                  | Strontium-85  | UI   | UI  | Data rejected due to low abundance. |      | .1206  |     |        |     |

# GEL QUALS

Batch ID: 958216

Report run on: March 16, 2010 2:07 PM

| Samp Id                          | Parname      | Cofa | Edd | Qual | Comments                            | Auto | Result | MDA | Uncert | SQL |
|----------------------------------|--------------|------|-----|------|-------------------------------------|------|--------|-----|--------|-----|
| 247964005-1<br>10-MAR-2010 23:10 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 6.499  |     |        |     |
|                                  | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.723  |     |        |     |
|                                  | Cesium-134   | UI   | UI  | UI   | Data rejected due to low abundance. |      | .121   |     | .1     | .1  |
|                                  | Mercury-203  | UI   | UI  | UI   | Data rejected due to low abundance. |      | .09882 |     | .1     | .1  |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 6.504  |     |        |     |
|                                  | Strontium-85 | UI   | UI  | UI   | Data rejected due to low abundance. |      | .1223  |     |        |     |
|                                  |              |      |     |      |                                     |      |        |     |        |     |
| 247969001-1<br>10-MAR-2010 23:10 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.143  |     |        |     |
|                                  | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.791  |     |        |     |
|                                  | Cesium-134   | UI   | UI  | UI   | Data rejected due to low abundance. |      | .1048  |     | .1     | .1  |
|                                  | Mercury-203  | UI   | UI  | UI   | Data rejected due to interference.  |      | .06122 |     | .1     | .1  |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.064  |     |        |     |
|                                  | Strontium-85 | UI   | UI  | UI   | Data rejected due to low abundance. |      | .09515 |     |        |     |
|                                  |              |      |     |      |                                     |      |        |     |        |     |
| 247969002-1<br>10-MAR-2010 23:10 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.928  |     |        |     |
|                                  | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.144  |     |        |     |
|                                  | Cesium-134   | UI   | UI  | UI   | Data rejected due to low abundance. |      | .146   |     | .1     | .1  |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 6.209  |     |        |     |
|                                  |              |      |     |      |                                     |      |        |     |        |     |
|                                  |              |      |     |      |                                     |      |        |     |        |     |
|                                  |              |      |     |      |                                     |      |        |     |        |     |
| 247969003-1<br>10-MAR-2010 23:11 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.219  |     |        |     |
|                                  | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.243  |     |        |     |
|                                  | Cesium-134   | UI   | UI  | UI   | Data rejected due to low abundance. |      | .08705 |     | .1     | .1  |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.687  |     |        |     |
|                                  | Strontium-85 | UI   | UI  | UI   | Data rejected due to low abundance. |      | .1586  |     |        |     |
|                                  |              |      |     |      |                                     |      |        |     |        |     |
|                                  |              |      |     |      |                                     |      |        |     |        |     |

# GEL QUALS

Batch ID: 958216

Report run on: March 16, 2010 2:07 PM

| Samp Id                          | Parname     | Cofa | Edd | Qual | Comments                            | Auto | Result | MDA | Uncert | SQL |
|----------------------------------|-------------|------|-----|------|-------------------------------------|------|--------|-----|--------|-----|
| 247969004-1<br>10-MAR-2010 23:11 | Bismuth-211 | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.919  |     |        |     |
|                                  | Cadmium-109 | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.377  |     |        |     |
|                                  | Radium-224  | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.636  |     |        |     |
| 247969005-1<br>10-MAR-2010 23:25 | Bismuth-211 | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.393  |     |        |     |
|                                  | Cadmium-109 | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.624  |     |        |     |
|                                  | Cesium-134  | UI   | UI  | UI   | Data rejected due to low abundance. |      | .1015  |     | .1     | .1  |
|                                  | Radium-224  | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.311  |     |        |     |
| 247969006-1<br>11-MAR-2010 14:14 | Bismuth-211 | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.706  |     |        |     |
|                                  | Cadmium-109 | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.714  |     |        |     |
|                                  | Radium-224  | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.737  |     |        |     |
| 247969007-1<br>11-MAR-2010 14:15 | Bismuth-211 | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.33   |     |        |     |
|                                  | Cadmium-109 | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.581  |     |        |     |
|                                  | Cesium-134  | UI   | UI  | UI   | Data rejected due to low abundance. |      | .1269  |     | .1     | .1  |
|                                  | Radium-224  | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.976  |     |        |     |
| 247969008-1<br>11-MAR-2010 14:17 | Bismuth-211 | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.069  |     |        |     |
|                                  | Cadmium-109 | UI   | UI  | UI   | Data rejected due to interference.  |      | 6.169  |     |        |     |
|                                  | Cesium-134  | UI   | UI  | UI   | Data rejected due to low abundance. |      | .1737  |     | .1     | .1  |
|                                  | Radium-224  | UI   | UI  | UI   | Data rejected due to interference.  |      | 6.134  |     |        |     |
| 247970001-1<br>11-MAR-2010 14:18 | Bismuth-211 | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.405  |     |        |     |

# GEL QUALS

Batch ID: 958216

Report run on: March 16, 2010 2:07 PM

| Samp Id                          | Parname      | Cofa | Edd | Qual | Comments                            | Auto | Result | MDA | Uncert | SQL |
|----------------------------------|--------------|------|-----|------|-------------------------------------|------|--------|-----|--------|-----|
|                                  | Mercury-203  |      |     | UI   | Data rejected due to interference   |      |        |     |        |     |
| 247970001-1<br>11-MAR-2010 14:18 | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.505  |     |        |     |
|                                  | Cesium-134   | UI   | UI  | UI   | Data rejected due to low abundance. |      | .1019  |     | .1     | .1  |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.737  |     |        |     |
|                                  | Strontium-85 | UI   | UI  | UI   | Data rejected due to low abundance. |      | .07248 |     |        |     |
| 247970002-1<br>11-MAR-2010 14:18 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.563  |     |        |     |
|                                  | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.719  |     |        |     |
|                                  | Cesium-134   | UI   | UI  | UI   | Data rejected due to low abundance. |      | .184   |     | .1     | .1  |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.82   |     |        |     |
| 247970003-1<br>11-MAR-2010 16:04 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.9    |     |        |     |
|                                  | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 2.518  |     |        |     |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.61   |     |        |     |
|                                  | Radium-228   | UI   | UI  | UI   | Data rejected due to low abundance. |      | 2.305  |     | .5     | .5  |
|                                  | Strontium-85 | UI   | UI  | UI   | Data rejected due to low abundance. |      | .1159  |     |        |     |
| 247970004-1<br>11-MAR-2010 18:12 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 2.982  |     |        |     |
|                                  | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.004  |     |        |     |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.218  |     |        |     |
| 247970005-1<br>11-MAR-2010 19:25 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.383  |     |        |     |
|                                  | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.424  |     |        |     |
|                                  | Mercury-203  | UI   | UI  | UI   | Data rejected due to interference.  |      | .105   |     | .1     | .1  |
|                                  | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 5.798  |     |        |     |



# GEL QUALS

Batch ID: 958216

Report run on: March 16, 2010 2:07 PM

| Samp Id                               | Parname      | Cofa | Edd | Qual | Comments                            | Auto | Result | MDA | Uncert | SQL |
|---------------------------------------|--------------|------|-----|------|-------------------------------------|------|--------|-----|--------|-----|
| 247970006-1<br>11-MAR-2010 19:25      | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.688  |     |        |     |
|                                       | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.079  |     |        |     |
|                                       | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.677  |     |        |     |
| 247970007-1<br>11-MAR-2010 19:26      | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.676  |     |        |     |
|                                       | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 2.532  |     |        |     |
|                                       | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.111  |     |        |     |
|                                       | Strontium-85 | UI   | UI  | UI   | Data rejected due to low abundance. |      | .07286 |     |        |     |
| 1202054949-1 DUP<br>11-MAR-2010 19:27 | Bismuth-211  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.755  |     |        |     |
|                                       | Cadmium-109  | UI   | UI  | UI   | Data rejected due to interference.  |      | 3.953  |     |        |     |
|                                       | Radium-224   | UI   | UI  | UI   | Data rejected due to interference.  |      | 4.902  |     |        |     |



\*\*\* = Number of isotopes identified with a keyline at this energy.

3/16/2010 9:55 AM

|               |    |        |          |       |         |       |       |   |       |            |       |                          |  |
|---------------|----|--------|----------|-------|---------|-------|-------|---|-------|------------|-------|--------------------------|--|
| Thallium-208  | ✓  | 0.8469 | 0.04814  | pCi/g | 0.05433 | 0.080 | 582.7 | 1 | 1.424 | IDENTIFIED | 4.34  | <input type="checkbox"/> |  |
| Thorium-228   | NR | 2.574  | 0.1486   | pCi/g | 0.08327 | N     | 238.3 | 2 | 1.273 | IDENTIFIED | 2.003 | <input type="checkbox"/> |  |
| Thorium-232   | NR | 2.705  | 0.2247   | pCi/g | 0.2168  | N     | 910.8 | 3 | 1.715 | IDENTIFIED | 5.356 | <input type="checkbox"/> |  |
| Thorium-234   | ✓  | 1.608  | 0.434    | pCi/g | 0.99    | 2.00  | 62.75 | 2 | 1.179 | IDENTIFIED | 25.42 | <input type="checkbox"/> |  |
| Tin-126       | NR | 0.571  | 0.04323  | pCi/g | 0.08408 | N     | 86.79 | 3 | 1.447 | IDENTIFIED | 6.54  | <input type="checkbox"/> |  |
| Total Uranium | —  | 4.9056 | 1.29E-06 | ug/g  | 1.4753  | N     | 0     |   |       |            |       | <input type="checkbox"/> |  |
| Uranium-238   | HE | 1.608  | 0.434    | pCi/g | 0.99    | N     | 62.75 | 2 | 1.179 | IDENTIFIED | 25.42 | <input type="checkbox"/> |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 247964004 | 19-FEB-10 12:00 | 10-MAR-10 23:09 | 19.5      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004GEL  | N     | RGSP  |

| Name              | Result | Uncert.  | Units    | MDA   | RDL     | Energy | ***   | FWHM | Comb Act | Rpt        | Err(%) | Qual                                | Qual Comment                           |
|-------------------|--------|----------|----------|-------|---------|--------|-------|------|----------|------------|--------|-------------------------------------|--|
| Actinium-228      | ✓      | 2.712    | 0.2257   | pCi/g | 0.2375  | N      | 911   | 3    | 1.995    | IDENTIFIED | 6.027  | <input type="checkbox"/>            |  |
| Annihilation Rad. | —      | 0.245    | 0.03374  | pCi/g | 0.04621 | N      | 510.7 | 1    | 1.894    | IDENTIFIED | 12.99  | <input type="checkbox"/>            |  |
| Bismuth-211       | INT    | 5.597    | 0.3329   | pCi/g | 0.3239  | Y      | 351.8 | 2    | 1.473    | IDENTIFIED | 3.565  | <input checked="" type="checkbox"/> | UI                                     |
| Bismuth-212       | —      | 2.678    | 0.4117   | pCi/g | 1.106   | N      | 0     | 7    | 0        | FAIL_ABUND | 0      | <input type="checkbox"/>            |  |
| Bismuth-214       | ✓      | 1.917    | 0.1285   | pCi/g | 0.1176  | 0.200  | 609.1 | 2    | 1.51     | IDENTIFIED | 4.229  | <input type="checkbox"/>            |  |
| Cadmium-109       | INT    | 4.957    | 0.4186   | pCi/g | 0.8717  | Y      | 87.24 | 3    | 1.162    | IDENTIFIED | 6.765  | <input checked="" type="checkbox"/> | UI                                     |
| Cerium-143        | —      | 10610    | 1447     | pCi/g | 0       | N      | 0     | 7    | 0        | SHORT_HLIF | 0      | <input type="checkbox"/>            |  |
| Cesium-134        | LA     | 0.1723   | 0.04773  | pCi/g | 0.09233 | 0.100  | 0     | 7    | 0        | FAIL_ABUND | 0      | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Europium-155      | HE     | 0.1662   | 0.05356  | pCi/g | 0.1408  | N      | 105.6 | 1    | 1.603    | IDENTIFIED | 31.72  | <input type="checkbox"/>            |  |
| Gross Gamma       | —      | 13.44    | 1.419    | pCi/g | 3.736   | N      | 0     |      |          |            |        | <input type="checkbox"/>            |  |
| Lead-210          | ✓      | 1.624    | 0.3728   | pCi/g | 0.7051  | N      | 46.42 | 1    | 1.171    | IDENTIFIED | 22.3   | <input type="checkbox"/>            |  |
| Lead-212          | ✓      | 2.382    | 0.133    | pCi/g | 0.08349 | 0.100  | 238.6 | 2    | 1.297    | IDENTIFIED | 2.118  | <input type="checkbox"/>            |  |
| Lead-214          | ✓      | 2.031    | 0.1332   | pCi/g | 0.1178  | 0.100  | 351.8 | 2    | 1.473    | IDENTIFIED | 3.565  | <input type="checkbox"/>            |  |
| Neptunium-237     | INT    | 1.436    | 0.1934   | pCi/g | 0.2515  | N      | 87.24 | 3    | 1.162    | IDENTIFIED | 6.765  | <input type="checkbox"/>            |  |
| Niobium-95m       | —      | 0.3671   | 0.06807  | pCi/g | 0.2145  | N      | 0     | 7    | 0        | NOT_IDENTI | 0      | <input type="checkbox"/>            |  |
| Potassium-40      | ✓      | 35.1     | 1.737    | pCi/g | 0.5842  | 1.00   | 1460  | 1    | 2.336    | IDENTIFIED | 2.117  | <input type="checkbox"/>            |  |
| Promethium-149    | HE     | 133      | 160.9    | pCi/g | 0       | N      | 0     | 7    | 0        | SHORT_HLIF | 0      | <input type="checkbox"/>            |  |
| Radium-224        | INT    | 5.46     | 0.5391   | pCi/g | 0.8949  | Y      | 241.6 | 1    | 1.661    | IDENTIFIED | 8.718  | <input checked="" type="checkbox"/> | UI                                     |
| Radium-226        | ✓      | 1.917    | 0.1285   | pCi/g | 0.1176  | Y      | 609.1 | 2    | 1.51     | IDENTIFIED | 4.229  | <input type="checkbox"/>            |  |
| Radium-228        | ✓      | 2.712    | 0.2257   | pCi/g | 0.2375  | 0.500  | 911   | 3    | 1.995    | IDENTIFIED | 6.027  | <input type="checkbox"/>            |  |
| Sodium-24         | HE     | 2.48E+07 | 4.89E+07 | pCi/g | 0       | N      | 0     | 7    | 0        | SHORT_HLIF | 0      | <input type="checkbox"/>            |  |
| Strontium-85      | LA     | 0.1206   | 0.02246  | pCi/g | 0.07246 | Y      | 0     | 7    | 0        | NOT_IDENTI | 0      | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Thallium-208      | ✓      | 0.7746   | 0.05359  | pCi/g | 0.05732 | 0.080  | 583   | 1    | 1.725    | IDENTIFIED | 4.963  | <input type="checkbox"/>            |  |
| Thorium-228       | NR     | 2.382    | 0.133    | pCi/g | 0.08349 | N      | 238.6 | 2    | 1.297    | IDENTIFIED | 2.118  | <input type="checkbox"/>            |  |
| Thorium-232       | NR     | 2.712    | 0.2257   | pCi/g | 0.2375  | N      | 911   | 3    | 1.995    | IDENTIFIED | 6.027  | <input type="checkbox"/>            |  |
| Thorium-234       | ✓      | 2.45     | 0.527    | pCi/g | 0.9192  | 2.00   | 63.32 | 2    | 1.167    | IDENTIFIED | 19.23  | <input type="checkbox"/>            |  |
| Tin-126           | NR     | 0.4814   | 0.04065  | pCi/g | 0.08454 | N      | 87.24 | 3    | 1.162    | IDENTIFIED | 6.765  | <input type="checkbox"/>            |  |
| Total Uranium     | —      | 7.3026   | 1.57E-06 | ug/g  | 1.3699  | N      | 0     |      |          |            |        | <input type="checkbox"/>            |  |
| Uranium-238       | NR     | 2.45     | 0.527    | pCi/g | 0.9192  | N      | 63.32 | 2    | 1.167    | IDENTIFIED | 19.23  | <input type="checkbox"/>            |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 247964005 | 19-FEB-10 12:00 | 10-MAR-10 23:10 | 19.5      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004GEL  | N     | RGSP  |

| Name         | Result | Uncert. | Units  | MDA   | RDL    | Energy | *** | FWHM | Comb Act | Rpt        | Err(%) | Qual                     | Qual Comment |
|--------------|--------|---------|--------|-------|--------|--------|-----|------|----------|------------|--------|--------------------------|--------------|
| Actinium-228 | ✓      | 2.666   | 0.2151 | pCi/g | 0.2158 | N      | 911 | 3    | 1.924    | IDENTIFIED | 5.336  | <input type="checkbox"/> |              |

|                   |     |          |          |               |       |       |    |        |            |       |                                     |  |
|-------------------|-----|----------|----------|---------------|-------|-------|----|--------|------------|-------|-------------------------------------|--|
| Annihilation Rad. | —   | 0.2167   | 0.03494  | pCi/g 0.04557 | N     | 510.8 | 1  | 1.7    | IDENTIFIED | 15.54 | <input type="checkbox"/>            |  |
| Bismuth-211       | INT | 6.499    | 0.3912   | pCi/g 0.3375  | Y     | 351.9 | 2  | 1.575  | IDENTIFIED | 3.397 | <input checked="" type="checkbox"/> | UI                                     |
| Bismuth-212       | ✓   | 2.547    | 0.4728   | pCi/g 0.7768  | N     | 726.7 | 1  | 1.882  | IDENTIFIED | 17.49 | <input type="checkbox"/>            |  |
| Bismuth-214       | ✓   | 1.887    | 0.1218   | pCi/g 0.1085  | 0.200 | 609.2 | 2  | 1.707  | IDENTIFIED | 4.106 | <input type="checkbox"/>            |  |
| Cadmium-109       | INT | 4.723    | 0.583    | pCi/g 1.364   | Y     | 87.44 | 3  | 1.24   | IDENTIFIED | 10.69 | <input checked="" type="checkbox"/> | UI                                     |
| Cadmium-115       | HE  | 9.989    | 22.12    | pCi/g 0       | N     | 0     | 11 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Cerium-143        | —   | 14050    | 1904     | pCi/g 0       | N     | 0     | 11 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Cesium-134        | LA  | 0.121    | 0.02537  | pCi/g 0.08916 | 0.100 | 0     | 11 | 0      | NOT_IDENTI | 0     | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Cesium-135        | HE  | 0.3962   | 0.09491  | pCi/g 0.297   | N     | 0     | 11 | 0      | NOT_IDENTI | 0     | <input type="checkbox"/>            |  |
| Gross Gamma       | —   | 13.93    | 1.596    | pCi/g 4.976   | N     | 0     |    |        |            |       | <input type="checkbox"/>            |  |
| Iodine-133        | HE  | 1.73E+05 | 99990    | pCi/g 0       | N     | 0     | 11 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Lead-212          | ✓   | 2.576    | 0.1651   | pCi/g 0.096   | 0.100 | 238.7 | 2  | 1.396  | IDENTIFIED | 2.318 | <input type="checkbox"/>            |  |
| Lead-214          | ✓   | 2.359    | 0.1562   | pCi/g 0.1224  | 0.100 | 351.9 | 2  | 1.575  | IDENTIFIED | 3.397 | <input type="checkbox"/>            |  |
| Mercury-203       | LA  | 0.09882  | 0.02473  | pCi/g 0.07768 | 0.100 | 0     | 11 | 0      | NOT_IDENTI | 0     | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Neptunium-237     | INT | 1.368    | 0.2216   | pCi/g 0.4058  | N     | 87.44 | 3  | 1.24   | IDENTIFIED | 10.69 | <input type="checkbox"/>            |  |
| Niobium-95        | HE  | 0.1049   | 0.02587  | pCi/g 0.08282 | N     | 0     | 11 | 0      | NOT_IDENTI | 0     | <input type="checkbox"/>            |  |
| Niobium-95m       | —   | 0.8735   | 0.09706  | pCi/g 0.2853  | N     | 0     | 11 | 0      | NOT_IDENTI | 0     | <input type="checkbox"/>            |  |
| Potassium-40      | ✓   | 36.07    | 1.956    | pCi/g 0.5023  | 1.00  | 1460  | 1  | 2.137  | IDENTIFIED | 2.293 | <input type="checkbox"/>            |  |
| Promethium-149    | HE  | 0.1153   | 179.6    | pCi/g 0       | N     | 0     | 11 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Radium-224        | INT | 6.504    | 0.7131   | pCi/g 1.028   | Y     | 241.7 | 1  | 1.79   | IDENTIFIED | 9.477 | <input checked="" type="checkbox"/> | UI                                     |
| Radium-226        | ✓   | 1.887    | 0.1218   | pCi/g 0.1085  | Y     | 609.2 | 2  | 1.707  | IDENTIFIED | 4.106 | <input type="checkbox"/>            |  |
| Radium-228        | ✓   | 2.666    | 0.2151   | pCi/g 0.2158  | 0.500 | 911   | 3  | 1.924  | IDENTIFIED | 5.336 | <input type="checkbox"/>            |  |
| Sodium-24         | HE  | 2.32E+07 | 4.70E+07 | pCi/g 0       | N     | 0     | 11 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Strontium-85      | LA  | 0.1223   | 0.02368  | pCi/g 0.07551 | Y     | 0     | 11 | 0      | NOT_IDENTI | 0     | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Thallium-208      | ✓   | 0.8098   | 0.05505  | pCi/g 0.05772 | 0.080 | 583   | 1  | 1.658  | IDENTIFIED | 5.029 | <input type="checkbox"/>            |  |
| Thorium-228       | NR  | 2.576    | 0.1651   | pCi/g 0.096   | N     | 238.7 | 2  | 1.396  | IDENTIFIED | 2.318 | <input type="checkbox"/>            |  |
| Thorium-232       | NR  | 2.666    | 0.2151   | pCi/g 0.2158  | N     | 911   | 3  | 1.924  | IDENTIFIED | 5.336 | <input type="checkbox"/>            |  |
| Thorium-234       | ✓   | 3.372    | 1.372    | pCi/g 3.154   | 2.00  | 63.27 | 2  | 0.7965 | IDENTIFIED | 39.47 | <input type="checkbox"/>            |  |
| Tin-126           | NR  | 0.4586   | 0.05661  | pCi/g 0.1334  | N     | 87.44 | 3  | 1.24   | IDENTIFIED | 10.69 | <input type="checkbox"/>            |  |
| Total Uranium     | —   | 10.026   | 4.08E-06 | ug/g 4.6955   | N     | 0     |    |        |            |       | <input type="checkbox"/>            |  |
| Uranium-238       | HE  | 3.372    | 1.372    | pCi/g 3.154   | N     | 63.27 | 2  | 0.7965 | IDENTIFIED | 39.47 | <input type="checkbox"/>            |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID         | Collect Date    | Run Date        | Days Past | Sample Type   | Status | Instance   | Client | Project   | Quals      | Zero? | queue  |
|-------------------|-----------------|-----------------|-----------|---------------|--------|------------|--------|-----------|------------|-------|--|
| 247969001         | 20-FEB-10 12:00 | 10-MAR-10 23:10 | 18.5      | SAMPLE        | LOAD   | I          | LANL   | LANL01004 | GEL        | N     | RGSP   |
| Name              | Result          | Uncert.         | Units     | MDA           | RDL    | Energy *** | FWHM   | Comb Act  | Rpt Err(%) | Qual  | Qual Comment   |
| Actinium-228      | ✓               | 2.39            | 0.1908    | pCi/g 0.1367  | N      | 910.5      | 3      | 1.865     | IDENTIFIED | 4.219 | <input type="checkbox"/>   |
| Annihilation Rad. | —               | 0.1654          | 0.02342   | pCi/g 0.02834 | N      | 510.5      | 1      | 1.882     | IDENTIFIED | 13.77 | <input type="checkbox"/>   |
| Bismuth-211       | INT             | 5.143           | 0.2282    | pCi/g 0.2048  | Y      | 351.9      | 2      | 1.402     | IDENTIFIED | 3.061 | <input checked="" type="checkbox"/> UI                                     |
| Bismuth-212       | ✓               | 2.343           | 0.2914    | pCi/g 0.5073  | N      | 726.9      | 1      | 1.616     | IDENTIFIED | 10.78 | <input type="checkbox"/>   |
| Bismuth-214       | ✓               | 1.621           | 0.08866   | pCi/g 0.06989 | 0.200  | 608.9      | 2      | 1.703     | IDENTIFIED | 3.12  | <input type="checkbox"/>   |
| Cadmium-109       | INT             | 3.791           | 0.4049    | pCi/g 0.8868  | Y      | 87.35      | 3      | 1.041     | IDENTIFIED | 9.641 | <input checked="" type="checkbox"/> UI                                     |
| Cerium-143        | —               | 6011            | 746.3     | pCi/g 0       | N      | 0          | 8      | 0         | SHORT_HLIF | 0     | <input type="checkbox"/>   |
| Cesium-134        | LA              | 0.1048          | 0.01738   | pCi/g 0.05644 | 0.100  | 0          | 8      | 0         | NOT_IDENTI | 0     | <input checked="" type="checkbox"/> UI Data rejected due to low abundance. |
| Cesium-135        | HE              | 0.2208          | 0.06144   | pCi/g 0.1905  | N      | 0          | 8      | 0         | NOT_IDENTI | 0     | <input type="checkbox"/>   |
| Europium-155      | HE              | 0.1449          | 0.04902   | pCi/g 0.122   | N      | 105.5      | 1      | 1.28      | IDENTIFIED | 33.65 | <input type="checkbox"/>   |
| Gross Gamma       | —               | 12.31           | 1.261     | pCi/g 2.598   | N      | 0          |        |           |            |       | <input type="checkbox"/>   |

|                |     |         |               |         |       |       |   |       |            |       |                                     |  |
|----------------|-----|---------|---------------|---------|-------|-------|---|-------|------------|-------|-------------------------------------|--|
| Lead-212       | ✓   | 2.03    | 0.08321 pCi/g | 0.06219 | 0.100 | 238.7 | 2 | 1.176 | IDENTIFIED | 1.952 | <input type="checkbox"/>            |  |
| Lead-214       | ✓   | 1.867   | 0.0975 pCi/g  | 0.07446 | 0.100 | 351.9 | 2 | 1.402 | IDENTIFIED | 3.061 | <input type="checkbox"/>            |  |
| Manganese-54   | HE  | 0.04185 | 0.01201 pCi/g | 0.04153 | N     | 835.3 | 1 | 1.608 | IDENTIFIED | 28.23 | <input type="checkbox"/>            |  |
| Mercury-203    | INT | 0.06122 | 0.01974 pCi/g | 0.0403  | 0.100 | 278   | 1 | 1.371 | IDENTIFIED | 32.1  | <input checked="" type="checkbox"/> | UI                                     |
| Neptunium-237  | INT | 1.1     | 0.1646 pCi/g  | 0.3018  | N     | 87.35 | 3 | 1.041 | IDENTIFIED | 9.641 | <input type="checkbox"/>            |  |
| Niobium-95     | —   | 0.09106 | 0.01743 pCi/g | 0.05554 | N     | 0     | 8 | 0     | NOT_IDENTI | 0     | <input type="checkbox"/>            |  |
| Niobium-95m    | HE  | 0.2104  | 0.04944 pCi/g | 0.1554  | N     | 0     | 8 | 0     | NOT_IDENTI | 0     | <input type="checkbox"/>            |  |
| Potassium-40   | ✓   | 36.67   | 1.507 pCi/g   | 0.2915  | 1.00  | 1460  | 1 | 2.406 | IDENTIFIED | 1.573 | <input type="checkbox"/>            |  |
| Promethium-149 | HE  | 39.69   | 84.14 pCi/g   | 0       | N     | 0     | 8 | 0     | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Radium-224     | INT | 5.064   | 0.4438 pCi/g  | 0.6656  | Y     | 241.6 | 1 | 1.668 | IDENTIFIED | 8.31  | <input checked="" type="checkbox"/> | UI                                     |
| Radium-226     | ✓   | 1.621   | 0.08866 pCi/g | 0.06989 | Y     | 608.9 | 2 | 1.703 | IDENTIFIED | 3.12  | <input type="checkbox"/>            |  |
| Radium-228     | ✓   | 2.39    | 0.1908 pCi/g  | 0.1367  | 0.500 | 910.5 | 3 | 1.865 | IDENTIFIED | 4.219 | <input type="checkbox"/>            |  |
| Strontium-85   | LA  | 0.09515 | 0.01354 pCi/g | 0.04501 | Y     | 0     | 8 | 0     | NOT_IDENTI | 0     | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Thallium-208   | ✓   | 0.5969  | 0.03385 pCi/g | 0.03674 | 0.080 | 582.9 | 1 | 1.472 | IDENTIFIED | 4.106 | <input type="checkbox"/>            |  |
| Thorium-228    | NR  | 2.03    | 0.08321 pCi/g | 0.06219 | N     | 238.7 | 2 | 1.176 | IDENTIFIED | 1.952 | <input type="checkbox"/>            |  |
| Thorium-232    | NR  | 2.39    | 0.1908 pCi/g  | 0.1367  | N     | 910.5 | 3 | 1.865 | IDENTIFIED | 4.219 | <input type="checkbox"/>            |  |
| Tin-126        | NR  | 0.3686  | 0.03937 pCi/g | 0.09955 | N     | 87.35 | 3 | 1.041 | IDENTIFIED | 9.641 | <input type="checkbox"/>            |  |
| Zinc-65        | HE  | 0.1369  | 0.03616 pCi/g | 0.1138  | N     | 0     | 8 | 0     | NOT_IDENTI | 0     | <input type="checkbox"/>            |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID         | Collect Date    | Run Date        | Days Past | Sample Type   | Status | Instance   | Client | Project Quals | Zero?      | queue |                                     |  |
|-------------------|-----------------|-----------------|-----------|---------------|--------|------------|--------|---------------|------------|-------|-------------------------------------|--|
| 247969002         | 20-FEB-10 12:00 | 10-MAR-10 23:10 | 18.5      | SAMPLE        | LOAD   | 1          | LANL   | LANL010040GEL | N          | RGSP  |                                     |  |
| Name              | Result          | Uncert.         | Units     | MDA           | RDL    | Energy *** | FWHM   | Comb Act      | Rpt Err(%) | Qual  | Qual Comment                        |  |
| Actinium-228      | ✓               | 2.321           | 0.2133    | pCi/g 0.2035  | N      | 910.6      | 3      | 1.469         | IDENTIFIED | 7.09  | <input type="checkbox"/>            |  |
| Annihilation Rad. | —               | 0.1462          | 0.02995   | pCi/g 0.03993 | N      | 510.5      | 1      | 1.718         | IDENTIFIED | 19.92 | <input type="checkbox"/>            |  |
| Bismuth-211       | INT             | 4.928           | 0.2934    | pCi/g 0.2475  | Y      | 351.7      | 2      | 0.972         | IDENTIFIED | 3.885 | <input checked="" type="checkbox"/> | UI                                     |
| Bismuth-212       | —               | 3.568           | 0.4526    | pCi/g 1.199   | N      | 0          | 8      | 0             | FAIL_ABUND | 0     | <input type="checkbox"/>            |  |
| Bismuth-214       | ✓               | 1.659           | 0.1189    | pCi/g 0.09521 | 0.200  | 608.9      | 2      | 1.207         | IDENTIFIED | 4.03  | <input type="checkbox"/>            |  |
| Cadmium-109       | INT             | 4.144           | 0.3244    | pCi/g 0.575   | Y      | 87.18      | 3      | 0.9673        | IDENTIFIED | 6.282 | <input checked="" type="checkbox"/> | UI                                     |
| Cerium-143        | —               | 2756            | 444.2     | pCi/g 0       | N      | 0          | 8      | 0             | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Cesium-134        | LA              | 0.146           | 0.02476   | pCi/g 0.08579 | 0.100  | 0          | 8      | 0             | NOT_IDENTI | 0     | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Europium-155      | HE              | 0.1491          | 0.04755   | pCi/g 0.09173 | N      | 105.1      | 1      | 1.208         | IDENTIFIED | 31.46 | <input type="checkbox"/>            |  |
| Gross Gamma       | —               | 12.21           | 1.397     | pCi/g 3.863   | N      | 0          |        |               |            |       | <input type="checkbox"/>            |  |
| Iodine-133        | HE              | 9058            | 37560     | pCi/g 0       | N      | 0          | 8      | 0             | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Iodine-135        | —               | 1.11E+19        | 0         | pCi/g 0       | N      | 0          | 8      | 0             | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Lead-210          | ✓               | 1.3             | 0.2524    | pCi/g 0.4653  | N      | 46.55      | 1      | 0.6538        | IDENTIFIED | 18.82 | <input type="checkbox"/>            |  |
| Lead-212          | ✓               | 2.14            | 0.1155    | pCi/g 0.06312 | 0.100  | 238.5      | 2      | 0.8757        | IDENTIFIED | 2.037 | <input type="checkbox"/>            |  |
| Lead-214          | ✓               | 1.789           | 0.1173    | pCi/g 0.0901  | 0.100  | 351.7      | 2      | 0.972         | IDENTIFIED | 3.885 | <input type="checkbox"/>            |  |
| Neptunium-237     | INT             | 1.203           | 0.1574    | pCi/g 0.169   | N      | 87.18      | 3      | 0.9673        | IDENTIFIED | 6.282 | <input type="checkbox"/>            |  |
| Potassium-40      | ✓               | 34.33           | 1.685     | pCi/g 0.522   | 1.00   | 1460       | 1      | 2.011         | IDENTIFIED | 2.422 | <input type="checkbox"/>            |  |
| Promethium-149    | HE              | 93.11           | 91.3      | pCi/g 0       | N      | 0          | 8      | 0             | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Radium-224        | INT             | 6.209           | 0.515     | pCi/g 0.6784  | Y      | 241.3      | 1      | 1.627         | IDENTIFIED | 7.004 | <input checked="" type="checkbox"/> | UI                                     |
| Radium-226        | ✓               | 1.659           | 0.1189    | pCi/g 0.09521 | Y      | 608.9      | 2      | 1.207         | IDENTIFIED | 4.03  | <input type="checkbox"/>            |  |
| Radium-228        | ✓               | 2.321           | 0.2133    | pCi/g 0.2035  | 0.500  | 910.6      | 3      | 1.469         | IDENTIFIED | 7.09  | <input type="checkbox"/>            |  |
| Sodium-24         | HE              | 9.03E+06        | 1.37E+07  | pCi/g 0       | N      | 0          | 8      | 0             | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Tellurium-125m    | HE              | 9.668           | 2.885     | pCi/g 9.38    | N      | 0          | 8      | 0             | NOT_IDENTI | 0     | <input type="checkbox"/>            |  |
| Thallium-208      | ✓               | 0.6478          | 0.04773   | pCi/g 0.05015 | 0.080  | 582.9      | 1      | 1.324         | IDENTIFIED | 4.968 | <input type="checkbox"/>            |  |



|                |     |          |          |               |       |       |   |       |            |       |                                     |    |
|----------------|-----|----------|----------|---------------|-------|-------|---|-------|------------|-------|-------------------------------------|----|
| Cadmium-109    | INT | 5.377    | 0.5662   | pCi/g 1.124   | Y     | 87    | 3 | 1.452 | IDENTIFIED | 9.351 | <input checked="" type="checkbox"/> | UI |
| Cerium-143     | —   | 7490     | 1002     | pCi/g 0       | N     | 0     | 8 | 0     | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Cesium-135     | HE  | 0.3988   | 0.08056  | pCi/g 0.2518  | N     | 0     | 8 | 0     | NOT_IDENTI | 0     | <input type="checkbox"/>            |    |
| Gross Gamma    | —   | 11.39    | 1.31     | pCi/g 3.502   | N     |       | 0 |       |            |       | <input type="checkbox"/>            |    |
| Iodine-133     | HE  | 16540    | 39370    | pCi/g 0       | N     | 0     | 8 | 0     | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Iodine-135     | —   | 4.56E+18 | 0        | pCi/g 0       | N     | 0     | 8 | 0     | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Lead-212       | ✓   | 2.181    | 0.09305  | pCi/g 0.07775 | 0.100 | 238.2 | 2 | 1.224 | IDENTIFIED | 2.249 | <input type="checkbox"/>            |    |
| Lead-214       | ✓   | 1.785    | 0.1079   | pCi/g 0.1048  | 0.100 | 351.4 | 2 | 1.401 | IDENTIFIED | 4.279 | <input type="checkbox"/>            |    |
| Neptunium-237  | INT | 1.56     | 0.2319   | pCi/g 0.3332  | N     | 87    | 3 | 1.452 | IDENTIFIED | 9.351 | <input type="checkbox"/>            |    |
| Niobium-95m    | —   | 1.19     | 0.08821  | pCi/g 0.2754  | N     | 0     | 8 | 0     | NOT_IDENTI | 0     | <input type="checkbox"/>            |    |
| Potassium-40   | ✓   | 31.79    | 1.418    | pCi/g 0.3878  | 1.00  | 1459  | 1 | 2.238 | IDENTIFIED | 2.43  | <input type="checkbox"/>            |    |
| Promethium-149 | HE  | 222.5    | 115.6    | pCi/g 0       | N     | 0     | 8 | 0     | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Radium-224     | INT | 5.636    | 0.5603   | pCi/g 0.8333  | Y     | 241.3 | 1 | 1.774 | IDENTIFIED | 9.533 | <input checked="" type="checkbox"/> | UI |
| Radium-226     | ✓   | 1.478    | 0.09421  | pCi/g 0.09705 | Y     | 608.4 | 2 | 1.473 | IDENTIFIED | 5.121 | <input type="checkbox"/>            |    |
| Radium-228     | ✓   | 2.106    | 0.1795   | pCi/g 0.1909  | 0.500 | 910   | 3 | 1.921 | IDENTIFIED | 6.112 | <input type="checkbox"/>            |    |
| Sodium-24      | HE  | 1.67E+07 | 1.54E+07 | pCi/g 0       | N     | 0     | 8 | 0     | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Thallium-208   | ✓   | 0.6479   | 0.04704  | pCi/g 0.05236 | 0.080 | 582.4 | 1 | 1.662 | IDENTIFIED | 6.498 | <input type="checkbox"/>            |    |
| Thorium-228    | NR  | 2.181    | 0.09305  | pCi/g 0.07775 | N     | 238.2 | 2 | 1.224 | IDENTIFIED | 2.249 | <input type="checkbox"/>            |    |
| Thorium-232    | NR  | 2.106    | 0.1795   | pCi/g 0.1909  | N     | 910   | 3 | 1.921 | IDENTIFIED | 6.112 | <input type="checkbox"/>            |    |
| Tin-126        | NR  | 0.5229   | 0.05506  | pCi/g 0.11    | N     | 87    | 3 | 1.452 | IDENTIFIED | 9.351 | <input type="checkbox"/>            |    |
| Total Uranium  | —   | 6.6183   | 2.69E-06 | ug/g 3.423    | N     |       | 0 |       |            |       | <input type="checkbox"/>            |    |
| Zinc-65        | HE  | 0.168    | 0.05116  | pCi/g 0.1631  | N     | 0     | 8 | 0     | NOT_IDENTI | 0     | <input type="checkbox"/>            |    |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID         | Collect Date    | Run Date        | Days Past | Sample Type   | Status | Instance   | Client | Project Quas        | Zero?      | queue        |                                     |  |
|-------------------|-----------------|-----------------|-----------|---------------|--------|------------|--------|---------------------|------------|--------------|-------------------------------------|--|
| 247969005         | 20-FEB-10 12:00 | 10-MAR-10 23:25 | 18.5      | SAMPLE        | LOAD   | I          | LANL   | LANL01004GEL        | N          | RGSP         |                                     |  |
| Name              | Result          | Uncert.         | Units     | MDA           | RDL    | Energy *** | FWHM   | Comb Act Rpt Err(%) | Qual       | Qual Comment |                                     |  |
| Actinium-228      | ✓               | 2.485           | 0.1961    | pCi/g 0.1603  | N      | 911.2      | 3      | 1.528               | IDENTIFIED | 5.004        | <input type="checkbox"/>            |  |
| Annihilation Rad. | —               | 0.197           | 0.02723   | pCi/g 0.03165 | N      | 510.7      | 1      | 1.65                | IDENTIFIED | 12.98        | <input type="checkbox"/>            |  |
| Barium-137m       | HE              | 0.08095         | 0.02124   | pCi/g 0.04683 | N      | 661.6      | 2      | 1.331               | IDENTIFIED | 25.86        | <input type="checkbox"/>            |  |
| Bismuth-211       | INT             | 5.393           | 0.341     | pCi/g 0.2239  | Y      | 351.9      | 2      | 1.231               | IDENTIFIED | 3.196        | <input checked="" type="checkbox"/> | UI                                     |
| Bismuth-212       | ✓               | 3.194           | 0.4       | pCi/g 0.5642  | N      | 727.3      | 1      | 1.255               | IDENTIFIED | 10.76        | <input type="checkbox"/>            |  |
| Bismuth-214       | ✓               | 1.612           | 0.1067    | pCi/g 0.0802  | 0.200  | 609.4      | 2      | 1.418               | IDENTIFIED | 3.951        | <input type="checkbox"/>            |  |
| Cadmium-109       | INT             | 4.624           | 0.468     | pCi/g 0.8327  | Y      | 87.19      | 3      | 1.295               | IDENTIFIED | 8.924        | <input checked="" type="checkbox"/> | UI                                     |
| Cerium-143        | —               | 2958            | 488.1     | pCi/g 0       | N      | 0          | 4      | 0                   | SHORT_HLIF | 0            | <input type="checkbox"/>            |  |
| Cesium-134        | LA              | 0.1015          | 0.02891   | pCi/g 0.06688 | 0.100  | 0          | 4      | 0                   | FAIL_ABUND | 0            | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Cesium-137        | ✓               | 0.08552         | 0.02244   | pCi/g 0.04947 | 0.100  | 661.6      | 2      | 1.331               | IDENTIFIED | 25.86        | <input type="checkbox"/>            |  |
| Gross Gamma       | —               | 12.87           | 1.422     | pCi/g 3.774   | N      |            | 0      |                     |            |              | <input type="checkbox"/>            |  |
| Iodine-133        | HE              | 7787            | 30700     | pCi/g 0       | N      | 0          | 4      | 0                   | SHORT_HLIF | 0            | <input type="checkbox"/>            |  |
| Lead-212          | ✓               | 2.291           | 0.1433    | pCi/g 0.06667 | 0.100  | 238.6      | 2      | 0.9897              | IDENTIFIED | 1.957        | <input type="checkbox"/>            |  |
| Lead-214          | ✓               | 1.957           | 0.135     | pCi/g 0.08142 | 0.100  | 351.9      | 2      | 1.231               | IDENTIFIED | 3.196        | <input type="checkbox"/>            |  |
| Neptunium-237     | INT             | 1.342           | 0.1955    | pCi/g 0.2455  | N      | 87.19      | 3      | 1.295               | IDENTIFIED | 8.924        | <input type="checkbox"/>            |  |
| Potassium-40      | ✓               | 35.05           | 1.684     | pCi/g 0.3788  | 1.00   | 1461       | 1      | 1.88                | IDENTIFIED | 1.943        | <input type="checkbox"/>            |  |
| Radium-224        | INT             | 5.311           | 0.5461    | pCi/g 0.7146  | Y      | 241.4      | 1      | 1.578               | IDENTIFIED | 8.678        | <input checked="" type="checkbox"/> | UI                                     |
| Radium-226        | ✓               | 1.612           | 0.1067    | pCi/g 0.0802  | Y      | 609.4      | 2      | 1.418               | IDENTIFIED | 3.951        | <input type="checkbox"/>            |  |
| Radium-228        | ✓               | 2.485           | 0.1961    | pCi/g 0.1603  | 0.500  | 911.2      | 3      | 1.528               | IDENTIFIED | 5.004        | <input type="checkbox"/>            |  |
| Sodium-24         | HE              | 4.91E+06        | 1.07E+07  | pCi/g 0       | N      | 0          | 4      | 0                   | SHORT_HLIF | 0            | <input type="checkbox"/>            |  |



|               |    |        |          |       |         |       |       |   |        |            |       |                          |  |
|---------------|----|--------|----------|-------|---------|-------|-------|---|--------|------------|-------|--------------------------|--|
| Thallium-208  | ✓  | 0.6842 | 0.04691  | pCi/g | 0.04048 | 0.080 | 583.2 | 1 | 1.196  | IDENTIFIED | 4.744 | <input type="checkbox"/> |  |
| Thorium-228   | NR | 2.291  | 0.1433   | pCi/g | 0.06667 | N     | 238.6 | 2 | 0.9897 | IDENTIFIED | 1.957 | <input type="checkbox"/> |  |
| Thorium-232   | NR | 2.485  | 0.1961   | pCi/g | 0.1603  | N     | 911.2 | 3 | 1.528  | IDENTIFIED | 5.004 | <input type="checkbox"/> |  |
| Thorium-234   | ✓  | 2.371  | 0.729    | pCi/g | 1.495   | 2.00  | 63.46 | 2 | 0.9794 | IDENTIFIED | 29.42 | <input type="checkbox"/> |  |
| Tin-126       | NR | 0.4497 | 0.04551  | pCi/g | 0.08135 | N     | 87.19 | 3 | 1.295  | IDENTIFIED | 8.924 | <input type="checkbox"/> |  |
| Total Uranium | ✓  | 7.093  | 2.17E-06 | ug/g  | 2.2262  | N     |       | 0 |        |            |       | <input type="checkbox"/> |  |
| Uranium-238   | HE | 2.371  | 0.729    | pCi/g | 1.495   | N     | 63.46 | 2 | 0.9794 | IDENTIFIED | 29.42 | <input type="checkbox"/> |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 247969006 | 20-FEB-10 12:00 | 11-MAR-10 14:14 | 19.1      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004KJEL | N     | RGSP  |

| Name                 | Result | Uncert.  | Units   | MDA   | RDL     | Energy | ***   | FWHM | Comb Act | Rpt Err(%) | Qual  | Qual Comment                        |    |
|----------------------|--------|----------|---------|-------|---------|--------|-------|------|----------|------------|-------|-------------------------------------|----|
| Actinium-228         | ✓      | 2.117    | 0.2066  | pCi/g | 0.2419  | N      | 909.9 | 3    | 2.049    | IDENTIFIED | 7.744 | <input type="checkbox"/>            |    |
| Annihilation Rad. HE |        | 0.1335   | 0.0418  | pCi/g | 0.05275 | N      | 510   | 1    | 1.698    | IDENTIFIED | 31.18 | <input type="checkbox"/>            |    |
| Bismuth-211          | INT    | 4.706    | 0.3082  | pCi/g | 0.3767  | Y      | 351.3 | 2    | 1.493    | IDENTIFIED | 5.68  | <input checked="" type="checkbox"/> | UI |
| Bismuth-212          | HE     | 1.849    | 0.468   | pCi/g | 1.363   | N      | 0     | 7    | 0        | FAIL_ABUND | 0     | <input type="checkbox"/>            |    |
| Bismuth-214          | ✓      | 1.557    | 0.09839 | pCi/g | 0.1362  | 0.200  | 608.5 | 2    | 1.633    | IDENTIFIED | 5.056 | <input type="checkbox"/>            |    |
| Cadmium-109          | INT    | 3.714    | 0.8548  | pCi/g | 1.623   | Y      | 86.72 | 3    | 0.9637   | IDENTIFIED | 22.5  | <input checked="" type="checkbox"/> | UI |
| Cadmium-115          | HE     | 26.84    | 22.14   | pCi/g | 0       | N      | 0     | 7    | 0        | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Cerium-143           | —      | 11550    | 1528    | pCi/g | 0       | N      | 0     | 7    | 0        | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Cesium-135           | INT    | 0.6788   | 0.1662  | pCi/g | 0.2811  | N      | 269.4 | 1    | 1.586    | IDENTIFIED | 24.19 | <input type="checkbox"/>            |    |
| Gross Gamma          | —      | 10.57    | 1.522   | pCi/g | 4.319   | N      |       | 0    |          |            |       | <input type="checkbox"/>            |    |
| Iodine-133           | HE     | 47980    | 81450   | pCi/g | 0       | N      | 0     | 7    | 0        | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Lead-212             | ✓      | 2.001    | 0.09589 | pCi/g | 0.1079  | 0.100  | 238.3 | 2    | 1.216    | IDENTIFIED | 3.132 | <input type="checkbox"/>            |    |
| Lead-214             | ✓      | 1.708    | 0.1214  | pCi/g | 0.137   | 0.100  | 351.3 | 2    | 1.493    | IDENTIFIED | 5.68  | <input type="checkbox"/>            |    |
| Neptunium-237        | INT    | 1.077    | 0.2723  | pCi/g | 0.4854  | N      | 86.72 | 3    | 0.9637   | IDENTIFIED | 22.5  | <input type="checkbox"/>            |    |
| Niobium-95           | HE     | 0.09669  | 0.03226 | pCi/g | 0.08482 | N      | 767.5 | 1    | 2.386    | IDENTIFIED | 33.19 | <input type="checkbox"/>            |    |
| Niobium-95m          | —      | 1.002    | 0.107   | pCi/g | 0.3586  | N      | 0     | 7    | 0        | NOT_IDENTI | 0     | <input type="checkbox"/>            |    |
| Potassium-40         | ✓      | 29.32    | 1.451   | pCi/g | 0.5684  | 1.00   | 1459  | 1    | 2.539    | IDENTIFIED | 3.237 | <input type="checkbox"/>            |    |
| Promethium-149       | HE     | 170.5    | 181.4   | pCi/g | 0       | N      | 0     | 7    | 0        | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Radium-224           | INT    | 4.737    | 0.6289  | pCi/g | 1.157   | Y      | 241.4 | 1    | 1.774    | IDENTIFIED | 12.97 | <input checked="" type="checkbox"/> | UI |
| Radium-226           | ✓      | 1.557    | 0.09839 | pCi/g | 0.1362  | Y      | 608.5 | 2    | 1.633    | IDENTIFIED | 5.056 | <input type="checkbox"/>            |    |
| Radium-228           | ✓      | 2.117    | 0.2066  | pCi/g | 0.2419  | 0.500  | 909.9 | 3    | 2.049    | IDENTIFIED | 7.744 | <input type="checkbox"/>            |    |
| Technetium-99m       | —      | 3.63E+19 | 0       | pCi/g | 0       | N      | 0     | 7    | 0        | SHORT_HLIF | 0     | <input type="checkbox"/>            |    |
| Thallium-208         | ✓      | 0.6796   | 0.04844 | pCi/g | 0.05795 | 0.080  | 582.3 | 1    | 1.606    | IDENTIFIED | 6.349 | <input type="checkbox"/>            |    |
| Thorium-228          | NR     | 2.001    | 0.09589 | pCi/g | 0.1079  | N      | 238.3 | 2    | 1.216    | IDENTIFIED | 3.132 | <input type="checkbox"/>            |    |
| Thorium-232          | NR     | 2.117    | 0.2066  | pCi/g | 0.2419  | N      | 909.9 | 3    | 2.049    | IDENTIFIED | 7.744 | <input type="checkbox"/>            |    |
| Tin-126              | NR     | 0.3609   | 0.08306 | pCi/g | 0.1587  | N      | 86.72 | 3    | 0.9637   | IDENTIFIED | 22.5  | <input type="checkbox"/>            |    |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 247969007 | 20-FEB-10 12:00 | 11-MAR-10 14:15 | 19.1      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004KJEL | N     | RGSP  |

| Name              | Result | Uncert. | Units   | MDA   | RDL     | Energy | ***   | FWHM | Comb Act | Rpt Err(%) | Qual  | Qual Comment                        |    |
|-------------------|--------|---------|---------|-------|---------|--------|-------|------|----------|------------|-------|-------------------------------------|----|
| Actinium-228      | ✓      | 2.286   | 0.2252  | pCi/g | 0.2374  | N      | 911.5 | 3    | 1.714    | IDENTIFIED | 7.615 | <input type="checkbox"/>            |    |
| Annihilation Rad. | —      | 0.1827  | 0.03541 | pCi/g | 0.04568 | N      | 510.8 | 1    | 1.422    | IDENTIFIED | 18.63 | <input type="checkbox"/>            |    |
| Bismuth-211       | INT    | 5.33    | 0.4243  | pCi/g | 0.2947  | Y      | 352   | 2    | 1.078    | IDENTIFIED | 4.49  | <input checked="" type="checkbox"/> | UI |
| Bismuth-212       | ✓      | 2.596   | 0.4103  | pCi/g | 0.8242  | N      | 727.6 | 1    | 1.552    | IDENTIFIED | 14.36 | <input type="checkbox"/>            |    |
| Bismuth-214       | ✓      | 1.585   | 0.1263  | pCi/g | 0.1184  | 0.200  | 609.6 | 2    | 1.351    | IDENTIFIED | 5.603 | <input type="checkbox"/>            |    |

|                |     |          |          |               |       |       |   |        |            |       |  |                                     |
|----------------|-----|----------|----------|---------------|-------|-------|---|--------|------------|-------|--|-------------------------------------|
| Cadmium-109    | INT | 5.581    | 0.5665   | pCi/g 1.074   | Y     | 87.22 | 3 | 1.2    | IDENTIFIED | 9     | <input checked="" type="checkbox"/> UI |                                     |
| Cerium-143     | —   | 2735     | 685.1    | pCi/g 0       | N     | 0     | 5 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>               |                                     |
| Cesium-134     | LA  | 0.1269   | 0.03552  | pCi/g 0.09645 | 0.100 | 0     | 5 | 0      | FAIL_ABUND | 0     | <input checked="" type="checkbox"/> UI | Data rejected due to low abundance. |
| Gross Gamma    | —   | 12.5     | 1.544    | pCi/g 4.502   | N     |       |   |        |            |       | <input type="checkbox"/>               |                                     |
| Iodine-133     | HE  | 11990    | 65600    | pCi/g 0       | N     | 0     | 5 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>               |                                     |
| Lead-212       | ✓   | 2.286    | 0.1731   | pCi/g 0.09372 | 0.100 | 238.7 | 2 | 0.9851 | IDENTIFIED | 2.837 | <input type="checkbox"/>               |                                     |
| Lead-214       | ✓   | 1.934    | 0.163    | pCi/g 0.1072  | 0.100 | 352   | 2 | 1.078  | IDENTIFIED | 4.49  | <input type="checkbox"/>               |                                     |
| Neptunium-237  | INT | 1.618    | 0.2361   | pCi/g 0.315   | N     | 87.22 | 3 | 1.2    | IDENTIFIED | 9     | <input type="checkbox"/>               |                                     |
| Potassium-40   | ✓   | 33.81    | 1.76     | pCi/g 0.4649  | 1.00  | 1461  | 1 | 1.729  | IDENTIFIED | 2.897 | <input type="checkbox"/>               |                                     |
| Radium-224     | INT | 5.976    | 0.7003   | pCi/g 1.005   | Y     | 241.6 | 1 | 1.52   | IDENTIFIED | 9.605 | <input checked="" type="checkbox"/> UI |                                     |
| Radium-226     | ✓   | 1.585    | 0.1263   | pCi/g 0.1184  | Y     | 609.6 | 2 | 1.351  | IDENTIFIED | 5.603 | <input type="checkbox"/>               |                                     |
| Radium-228     | ✓   | 2.286    | 0.2252   | pCi/g 0.2374  | 0.500 | 911.5 | 3 | 1.714  | IDENTIFIED | 7.615 | <input type="checkbox"/>               |                                     |
| Sodium-24      | HE  | 2.85E+07 | 3.10E+07 | pCi/g 0       | N     | 0     | 5 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>               |                                     |
| Technetium-99m | —   | 2.30E+20 | 0        | pCi/g 0       | N     | 0     | 5 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>               |                                     |
| Thallium-208   | ✓   | 0.7221   | 0.06124  | pCi/g 0.06316 | 0.080 | 583.5 | 1 | 1.344  | IDENTIFIED | 6.544 | <input type="checkbox"/>               |                                     |
| Thorium-228    | NR  | 2.286    | 0.1731   | pCi/g 0.09372 | N     | 238.7 | 2 | 0.9851 | IDENTIFIED | 2.837 | <input type="checkbox"/>               |                                     |
| Thorium-232    | NR  | 2.286    | 0.2252   | pCi/g 0.2374  | N     | 911.5 | 3 | 1.714  | IDENTIFIED | 7.615 | <input type="checkbox"/>               |                                     |
| Thorium-234    | ✓   | 3.599    | 1.134    | pCi/g 1.655   | 2.00  | 62.92 | 2 | 1.243  | IDENTIFIED | 30.22 | <input type="checkbox"/>               |                                     |
| Tin-126        | NR  | 0.5423   | 0.05505  | pCi/g 0.1047  | N     | 87.22 | 3 | 1.2    | IDENTIFIED | 9     | <input type="checkbox"/>               |                                     |
| Total Uranium  | —   | 10.76    | 3.37E-06 | ug/g 2.4639   | N     |       |   |        |            |       | <input type="checkbox"/>               |                                     |
| Uranium-238    | HE  | 3.599    | 1.134    | pCi/g 1.655   | N     | 62.92 | 2 | 1.243  | IDENTIFIED | 30.22 | <input type="checkbox"/>               |                                     |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID         | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client   | Project      | Quals      | Zero? | queue                                  |                                     |
|-------------------|-----------------|-----------------|-----------|-------------|--------|----------|----------|--------------|------------|-------|--|-------------------------------------|
| 247969008         | 20-FEB-10 12:00 | 11-MAR-10 14:17 | 19.1      | SAMPLE      | LOAD   | 1        | LANL     | LANL01004GEL |            | N     | RGSP                                   |                                     |
| Name              | Result          | Uncert.         | Units     | MDA         | RDL    | Energy   | *** FWHM | Comb Act     | Rpt Err(%) | Qual  | Qual Comment                           |                                     |
| Actinium-228      | 2.128           | 0.2524          | pCi/g     | 0.232       | N      | 910.1    | 3        | 1.404        | IDENTIFIED | 10.32 | <input type="checkbox"/>               |                                     |
| Annihilation Rad. | 0.282           | 0.05229         | pCi/g     | 0.06273     | N      | 510.4    | 1        | 1.713        | IDENTIFIED | 17.99 | <input type="checkbox"/>               |                                     |
| Bismuth-211       | 5.069           | 0.395           | pCi/g     | 0.4098      | Y      | 351.6    | 2        | 1.266        | IDENTIFIED | 6.243 | <input type="checkbox"/>               |                                     |
| Bismuth-212       | 2.71            | 0.6355          | pCi/g     | 1.023       | N      | 726.6    | 1        | 1.608        | IDENTIFIED | 22.61 | <input type="checkbox"/>               |                                     |
| Bismuth-214       | 1.845           | 0.1512          | pCi/g     | 0.164       | 0.200  | 608.6    | 2        | 1.467        | IDENTIFIED | 6.409 | <input type="checkbox"/>               |                                     |
| Cadmium-109       | 6.169           | 0.5712          | pCi/g     | 0.9797      | Y      | 87.3     | 3        | 1.245        | IDENTIFIED | 7.87  | <input type="checkbox"/>               |                                     |
| Cerium-143        | 13280           | 1961            | pCi/g     | 0           | N      | 0        | 4        | 0            | SHORT_HLIF | 0     | <input type="checkbox"/>               |                                     |
| Cesium-134        | 0.1737          | 0.05586         | pCi/g     | 0.124       | 0.100  | 0        | 4        | 0            | FAIL_ABUND | 0     | <input checked="" type="checkbox"/> UI | Data rejected due to low abundance. |
| Cesium-135        | 0.6703          | 0.1486          | pCi/g     | 0.3118      | N      | 269.9    | 1        | 1.468        | IDENTIFIED | 21.55 | <input type="checkbox"/>               |                                     |
| Gross Gamma       | 12.36           | 1.66            | pCi/g     | 4.795       | N      | 0        |          |              |            |       | <input type="checkbox"/>               |                                     |
| Iodine-135        | 1.77E+20        | 0               | pCi/g     | 0           | N      | 0        | 4        | 0            | SHORT_HLIF | 0     | <input type="checkbox"/>               |                                     |
| Lead-210          | 1.51            | 0.5169          | pCi/g     | 0.8429      | N      | 46.32    | 1        | 0.7586       | IDENTIFIED | 33.8  | <input type="checkbox"/>               |                                     |
| Lead-212          | 2.337           | 0.1399          | pCi/g     | 0.1127      | 0.100  | 238.5    | 2        | 0.9944       | IDENTIFIED | 3.196 | <input type="checkbox"/>               |                                     |
| Lead-214          | 1.84            | 0.1521          | pCi/g     | 0.1491      | 0.100  | 351.6    | 2        | 1.266        | IDENTIFIED | 6.243 | <input type="checkbox"/>               |                                     |
| Neptunium-237     | 1.788           | 0.2502          | pCi/g     | 0.3071      | N      | 87.3     | 3        | 1.245        | IDENTIFIED | 7.87  | <input type="checkbox"/>               |                                     |
| Niobium-95        | 0.1929          | 0.05048         | pCi/g     | 0.09408     | N      | 766.9    | 1        | 1.012        | IDENTIFIED | 25.8  | <input type="checkbox"/>               |                                     |
| Potassium-40      | 27.49           | 1.59            | pCi/g     | 4.657       | 1.00   | 0        | 4        | 0            | NOT_IDENTI | 0     | <input checked="" type="checkbox"/> UI | Data rejected due to low abundance. |
| Radium-224        | 6.134           | 0.9078          | pCi/g     | 1.209       | Y      | 241.5    | 1        | 1.741        | IDENTIFIED | 14.09 | <input type="checkbox"/>               |                                     |
| Radium-226        | 1.845           | 0.1512          | pCi/g     | 0.164       | Y      | 608.6    | 2        | 1.467        | IDENTIFIED | 6.409 | <input type="checkbox"/>               |                                     |
| Radium-228        | 2.128           | 0.2524          | pCi/g     | 0.232       | 0.500  | 910.1    | 3        | 1.404        | IDENTIFIED | 10.32 | <input type="checkbox"/>               |                                     |
| Thallium-208      | 0.7221          | 0.06918         | pCi/g     | 0.07483     | 0.080  | 582.6    | 1        | 1.47         | IDENTIFIED | 8.334 | <input type="checkbox"/>               |                                     |

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|                |          |          |               |       |       |   |        |            |       |                                     |  |
|----------------|----------|----------|---------------|-------|-------|---|--------|------------|-------|-------------------------------------|--|
| Cadmium-109    | 5.581    | 0.5665   | pCi/g 1.074   | Y     | 87.22 | 3 | 1.2    | IDENTIFIED | 9     | <input type="checkbox"/>            |  |
| Cerium-143     | 2735     | 685.1    | pCi/g 0       | N     | 0     | 5 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Cesium-134     | 0.1269   | 0.03552  | pCi/g 0.09645 | 0.100 | 0     | 5 | 0      | FAIL_ABUND | 0     | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Gross Gamma    | 12.5     | 1.544    | pCi/g 4.502   | N     |       |   |        |            |       | <input type="checkbox"/>            |  |
| Iodine-133 HE  | 11990    | 65600    | pCi/g 0       | N     | 0     | 5 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Lead-212       | 2.286    | 0.1731   | pCi/g 0.09372 | 0.100 | 238.7 | 2 | 0.9851 | IDENTIFIED | 2.837 | <input type="checkbox"/>            |  |
| Lead-214       | 1.934    | 0.163    | pCi/g 0.1072  | 0.100 | 352   | 2 | 1.078  | IDENTIFIED | 4.49  | <input type="checkbox"/>            |  |
| Neptunium-237  | 1.618    | 0.2361   | pCi/g 0.315   | N     | 87.22 | 3 | 1.2    | IDENTIFIED | 9     | <input type="checkbox"/>            |  |
| Potassium-40   | 33.81    | 1.76     | pCi/g 0.4649  | 1.00  | 1461  | 1 | 1.729  | IDENTIFIED | 2.897 | <input type="checkbox"/>            |  |
| Radium-224     | 5.976    | 0.7003   | pCi/g 1.005   | Y     | 241.6 | 1 | 1.52   | IDENTIFIED | 9.605 | <input type="checkbox"/>            |  |
| Radium-226     | 1.585    | 0.1263   | pCi/g 0.1184  | Y     | 609.6 | 2 | 1.351  | IDENTIFIED | 5.603 | <input type="checkbox"/>            |  |
| Radium-228     | 2.286    | 0.2252   | pCi/g 0.2374  | 0.500 | 911.5 | 3 | 1.714  | IDENTIFIED | 7.615 | <input type="checkbox"/>            |  |
| Sodium-24 HE   | 2.85E+07 | 3.10E+07 | pCi/g 0       | N     | 0     | 5 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Technetium-99m | 2.30E+20 | 0        | pCi/g 0       | N     | 0     | 5 | 0      | SHORT_HLIF | 0     | <input type="checkbox"/>            |  |
| Thallium-208   | 0.7221   | 0.06124  | pCi/g 0.06316 | 0.080 | 583.5 | 1 | 1.344  | IDENTIFIED | 6.544 | <input type="checkbox"/>            |  |
| Thorium-228    | 2.286    | 0.1731   | pCi/g 0.09372 | N     | 238.7 | 2 | 0.9851 | IDENTIFIED | 2.837 | <input type="checkbox"/>            |  |
| Thorium-232    | 2.286    | 0.2252   | pCi/g 0.2374  | N     | 911.5 | 3 | 1.714  | IDENTIFIED | 7.615 | <input type="checkbox"/>            |  |
| Thorium-234    | 3.599    | 1.134    | pCi/g 1.655   | 2.00  | 62.92 | 2 | 1.243  | IDENTIFIED | 30.22 | <input type="checkbox"/>            |  |
| Tin-126        | 0.5423   | 0.05505  | pCi/g 0.1047  | N     | 87.22 | 3 | 1.2    | IDENTIFIED | 9     | <input type="checkbox"/>            |  |
| Total Uranium  | 10.76    | 3.37E-06 | ug/g 2.4639   | N     |       |   |        |            |       | <input type="checkbox"/>            |  |
| Uranium-238 HE | 3.599    | 1.134    | pCi/g 1.655   | N     | 62.92 | 2 | 1.243  | IDENTIFIED | 30.22 | <input type="checkbox"/>            |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID           | Collect Date    | Run Date        | Days Past     | Sample Type | Status | Instance   | Client | Project Quals       | Zero?                               | queue                                  |
|---------------------|-----------------|-----------------|---------------|-------------|--------|------------|--------|---------------------|-------------------------------------|--|
| 247969008           | 20-FEB-10 12:00 | 11-MAR-10 14:17 | 19.1          | SAMPLE      | LOAD   | 1          | LANL   | LANL01004RGF1       | N                                   | RGSP                                   |
| Name                | Result          | Uncert.         | Units         | MDA         | RDL    | Energy *** | FWHM   | Comb Act Rpt Err(%) | Qual                                | Qual Comment                           |
| Actinium-228 ✓      | 2.128           | 0.2524          | pCi/g 0.232   | N           | 910.1  | 3          | 1.404  | IDENTIFIED 10.32    | <input type="checkbox"/>            |  |
| Annihilation Rad. — | 0.282           | 0.05229         | pCi/g 0.06273 | N           | 510.4  | 1          | 1.713  | IDENTIFIED 17.99    | <input type="checkbox"/>            |  |
| Bismuth-211 INT ✓   | 5.069           | 0.395           | pCi/g 0.4098  | Y           | 351.6  | 2          | 1.266  | IDENTIFIED 6.243    | <input checked="" type="checkbox"/> | UI                                     |
| Bismuth-212 ✓       | 2.71            | 0.6355          | pCi/g 1.023   | N           | 726.6  | 1          | 1.608  | IDENTIFIED 22.61    | <input type="checkbox"/>            |  |
| Bismuth-214 ✓       | 1.845           | 0.1512          | pCi/g 0.164   | 0.200       | 608.6  | 2          | 1.467  | IDENTIFIED 6.409    | <input type="checkbox"/>            |  |
| Cadmium-109 INT ✓   | 6.169           | 0.5712          | pCi/g 0.9797  | Y           | 87.3   | 3          | 1.245  | IDENTIFIED 7.87     | <input checked="" type="checkbox"/> | UI                                     |
| Cerium-143 —        | 13280           | 1961            | pCi/g 0       | N           | 0      | 3          | 0      | SHORT_HLIF 0        | <input type="checkbox"/>            |  |
| Cesium-134 LA       | 0.1737          | 0.05586         | pCi/g 0.124   | 0.100       | 0      | 3          | 0      | FAIL_ABUND 0        | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Cesium-135 INT      | 0.6703          | 0.1486          | pCi/g 0.3118  | N           | 269.9  | 1          | 1.468  | IDENTIFIED 21.55    | <input type="checkbox"/>            |  |
| Gross Gamma —       | 12.36           | 1.66            | pCi/g 4.795   | N           |        |            |        |                     | <input type="checkbox"/>            |  |
| Iodine-135 —        | 1.77E+20        | 0               | pCi/g 0       | N           | 0      | 3          | 0      | SHORT_HLIF 0        | <input type="checkbox"/>            |  |
| Lead-210 HE         | 1.51            | 0.5169          | pCi/g 0.8429  | N           | 46.32  | 1          | 0.7586 | IDENTIFIED 33.8     | <input type="checkbox"/>            |  |
| Lead-212 ✓          | 2.337           | 0.1399          | pCi/g 0.1127  | 0.100       | 238.5  | 2          | 0.9944 | IDENTIFIED 3.196    | <input type="checkbox"/>            |  |
| Lead-214 ✓          | 1.84            | 0.1521          | pCi/g 0.1491  | 0.100       | 351.6  | 2          | 1.266  | IDENTIFIED 6.243    | <input type="checkbox"/>            |  |
| Neptunium-237 INT   | 1.788           | 0.2502          | pCi/g 0.3071  | N           | 87.3   | 3          | 1.245  | IDENTIFIED 7.87     | <input type="checkbox"/>            |  |
| Niobium-95 HE       | 0.1929          | 0.05048         | pCi/g 0.09408 | N           | 766.9  | 1          | 1.012  | IDENTIFIED 25.8     | <input type="checkbox"/>            |  |
| Potassium-40 ✓      | 32.83           | 1.841           | pCi/g 0.6355  | 1.00        | 1459   | 1          | 1.75   | IDENTIFIED 3.43     | <input type="checkbox"/>            |  |
| Radium-224 INT      | 6.134           | 0.9078          | pCi/g 1.209   | Y           | 241.5  | 1          | 1.741  | IDENTIFIED 14.09    | <input checked="" type="checkbox"/> | UI                                     |
| Radium-226 ✓        | 1.845           | 0.1512          | pCi/g 0.164   | Y           | 608.6  | 2          | 1.467  | IDENTIFIED 6.409    | <input type="checkbox"/>            |  |
| Radium-228 ✓        | 2.128           | 0.2524          | pCi/g 0.232   | 0.500       | 910.1  | 3          | 1.404  | IDENTIFIED 10.32    | <input type="checkbox"/>            |  |
| Thallium-208 ✓      | 0.7221          | 0.06918         | pCi/g 0.07483 | 0.080       | 582.6  | 1          | 1.47   | IDENTIFIED 8.334    | <input type="checkbox"/>            |  |

|               |    |        |          |       |         |      |       |   |        |            |       |                          |  |
|---------------|----|--------|----------|-------|---------|------|-------|---|--------|------------|-------|--------------------------|--|
| Thorium-228   | NR | 2.337  | 0.1399   | pCi/g | 0.1127  | N    | 238.5 | 2 | 0.9944 | IDENTIFIED | 3.196 | <input type="checkbox"/> |  |
| Thorium-232   | NR | 2.128  | 0.2524   | pCi/g | 0.232   | N    | 910.1 | 3 | 1.404  | IDENTIFIED | 10.32 | <input type="checkbox"/> |  |
| Thorium-234   | ✓  | 2.276  | 0.6352   | pCi/g | 1.174   | 2.00 | 63.04 | 2 | 0.9188 | IDENTIFIED | 26.23 | <input type="checkbox"/> |  |
| Tin-126       | NR | 0.5994 | 0.0555   | pCi/g | 0.09506 | N    | 87.3  | 3 | 1.245  | IDENTIFIED | 7.87  | <input type="checkbox"/> |  |
| Total Uranium | —  | 6.7231 | 1.89E-06 | ug/g  | 1.7491  | N    |       | 0 |        |            |       | <input type="checkbox"/> |  |
| Uranium-238   | HE | 2.276  | 0.6352   | pCi/g | 1.174   | N    | 63.04 | 2 | 0.9188 | IDENTIFIED | 26.23 | <input type="checkbox"/> |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 24797001  | 23-FEB-10 12:00 | 11-MAR-10 14:18 | 16.1      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004GEL  | N     | RGSP  |

| Name              | Result  | Uncert.  | Units   | MDA     | RDL     | Energy *** | FWHM  | Comb Act | Rpt Err(%) | Qual       | Qual Comment                        |  |  |
|-------------------|---------|----------|---------|---------|---------|------------|-------|----------|------------|------------|-------------------------------------|--|--|
| Actinium-228      | 2.153   | 0.1984   | pCi/g   | 0.1723  | N       | 910.4      | 3     | 1.8      | IDENTIFIED | 6.241      | <input type="checkbox"/>            |  |  |
| Annihilation Rad. | 0.1604  | 0.0265   | pCi/g   | 0.04015 | N       | 510.4      | 1     | 2.278    | IDENTIFIED | 16.19      | <input type="checkbox"/>            |  |  |
| Bismuth-211       | 4.405   | 0.235    | pCi/g   | 0.2815  | Y       | 351.8      | 2     | 1.382    | IDENTIFIED | 4.262      | <input type="checkbox"/>            |  |  |
| Bismuth-212       | 2.338   | 0.3754   | pCi/g   | 1.014   | N       | 0          | 5     | 0        | FAIL_ABUND | 0          | <input type="checkbox"/>            |  |  |
| Bismuth-214       | 1.19    | 0.09562  | pCi/g   | 0.1075  | 0.200   | 608.9      | 2     | 1.599    | IDENTIFIED | 6.663      | <input type="checkbox"/>            |  |  |
| Cadmium-109       | 3.505   | 0.5302   | pCi/g   | 1.528   | Y       | 87.33      | 3     | 1.541    | IDENTIFIED | 14.41      | <input type="checkbox"/>            |  |  |
| Cerium-143        | 1382    | 185.6    | pCi/g   | 0       | N       | 0          | 5     | 0        | SHORT_HLIF | 0          | <input type="checkbox"/>            |  |  |
| Cesium-134        | 0.1019  | 0.03152  | pCi/g   | 0.0799  | 0.100   | 0          | 5     | 0        | FAIL_ABUND | 0          | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |  |
| Europium-155      | HE      | 0.1648   | 0.05778 | pCi/g   | 0.1601  | N          | 105.7 | 1        | 1.034      | IDENTIFIED | 34.89                               | <input type="checkbox"/>               |  |
| Gross Gamma       | 10.88   | 1.287    | pCi/g   | 2.478   | N       | 0          |       |          |            |            | <input type="checkbox"/>            |  |  |
| Lead-212          | 1.898   | 0.08578  | pCi/g   | 0.08082 | 0.100   | 238.6      | 2     | 1.2      | IDENTIFIED | 2.726      | <input type="checkbox"/>            |  |  |
| Lead-214          | 1.599   | 0.09603  | pCi/g   | 0.1009  | 0.100   | 351.8      | 2     | 1.382    | IDENTIFIED | 4.262      | <input type="checkbox"/>            |  |  |
| Mercury-203       | 0.059   | 0.02453  | pCi/g   | 0.05506 | 0.100   | 278        | 1     | 1.499    | IDENTIFIED | 41.47      | <input type="checkbox"/>            |  |  |
| Neptunium-237     | 1.021   | 0.1879   | pCi/g   | 0.4284  | N       | 87.33      | 3     | 1.541    | IDENTIFIED | 14.41      | <input type="checkbox"/>            |  |  |
| Niobium-95        | HE      | 0.07099  | 0.02104 | pCi/g   | 0.06821 | N          | 0     | 5        | 0          | NOT_IDENTI | 0                                   | <input type="checkbox"/>               |  |
| Potassium-40      | 38.4    | 1.655    | pCi/g   | 0.4321  | 1.00    | 1460       | 1     | 2.283    | IDENTIFIED | 2.039      | <input type="checkbox"/>            |  |  |
| Radium-224        | 4.737   | 0.568    | pCi/g   | 0.8651  | Y       | 241.6      | 1     | 1.767    | IDENTIFIED | 11.66      | <input type="checkbox"/>            |  |  |
| Radium-226        | 1.19    | 0.09562  | pCi/g   | 0.1075  | Y       | 608.9      | 2     | 1.599    | IDENTIFIED | 6.663      | <input type="checkbox"/>            |  |  |
| Radium-228        | 2.153   | 0.1984   | pCi/g   | 0.1723  | 0.500   | 910.4      | 3     | 1.8      | IDENTIFIED | 6.241      | <input type="checkbox"/>            |  |  |
| Strontium-85      | 0.07248 | 0.01942  | pCi/g   | 0.06284 | Y       | 0          | 5     | 0        | NOT_IDENTI | 0          | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |  |
| Thallium-208      | 0.6023  | 0.0406   | pCi/g   | 0.04554 | 0.080   | 582.7      | 1     | 1.487    | IDENTIFIED | 5.49       | <input type="checkbox"/>            |  |  |
| Thorium-228       | 1.898   | 0.08578  | pCi/g   | 0.08082 | N       | 238.6      | 2     | 1.2      | IDENTIFIED | 2.726      | <input type="checkbox"/>            |  |  |
| Thorium-232       | 2.153   | 0.1984   | pCi/g   | 0.1723  | N       | 910.4      | 3     | 1.8      | IDENTIFIED | 6.241      | <input type="checkbox"/>            |  |  |
| Tin-126           | 0.3421  | 0.05175  | pCi/g   | 0.1484  | N       | 87.33      | 3     | 1.541    | IDENTIFIED | 14.41      | <input type="checkbox"/>            |  |  |
| Total Uranium     | 4.515   | 2.24E-06 | ug/g    | 3.9778  | N       | 0          |       |          |            |            | <input type="checkbox"/>            |  |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 24797002  | 23-FEB-10 12:00 | 11-MAR-10 14:18 | 16.1      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004GEL  | N     | RGSP  |

| Name              | Result | Uncert. | Units   | MDA    | RDL     | Energy *** | FWHM  | Comb Act | Rpt Err(%) | Qual       | Qual Comment                        |  |  |
|-------------------|--------|---------|---------|--------|---------|------------|-------|----------|------------|------------|-------------------------------------|--|--|
| Actinium-228      | 2.004  | 0.283   | pCi/g   | 0.3546 | N       | 910.9      | 3     | 1.155    | IDENTIFIED | 12.86      | <input type="checkbox"/>            |  |  |
| Annihilation Rad. | HE     | 0.09694 | 0.04926 | pCi/g  | 0.06111 | N          | 511.1 | 1        | 1.531      | IDENTIFIED | 50.59                               | <input type="checkbox"/>               |  |
| Bismuth-211       | 4.563  | 0.3488  | pCi/g   | 0.3067 | Y       | 351.7      | 2     | 1.176    | IDENTIFIED | 6.172      | <input type="checkbox"/>            |  |  |
| Bismuth-214       | 1.189  | 0.1316  | pCi/g   | 0.1392 | 0.200   | 609        | 2     | 1.073    | IDENTIFIED | 9.344      | <input type="checkbox"/>            |  |  |
| Cadmium-109       | 3.719  | 0.4304  | pCi/g   | 0.8558 | Y       | 87.23      | 3     | 0.941    | IDENTIFIED | 10.59      | <input type="checkbox"/>            |  |  |
| Cerium-143        | 629.2  | 157.4   | pCi/g   | 0      | N       | 0          | 4     | 0        | SHORT_HLIF | 0          | <input type="checkbox"/>            |  |  |
| Cesium-134        | 0.184  | 0.04279 | pCi/g   | 0.1388 | 0.100   | 0          | 4     | 0        | FAIL_ABUND | 0          | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |  |

20-5 hcl/10

|               |    |        |          |       |         |      |       |   |        |            |       |                          |  |
|---------------|----|--------|----------|-------|---------|------|-------|---|--------|------------|-------|--------------------------|--|
| Thorium-228   | NR | 2.337  | 0.1399   | pCi/g | 0.1127  | N    | 238.5 | 2 | 0.9944 | IDENTIFIED | 3.196 | <input type="checkbox"/> |  |
| Thorium-232   | NR | 2.128  | 0.2524   | pCi/g | 0.232   | N    | 910.1 | 3 | 1.404  | IDENTIFIED | 10.32 | <input type="checkbox"/> |  |
| Thorium-234   |    | 2.276  | 0.6352   | pCi/g | 1.174   | 2.00 | 63.04 | 2 | 0.9188 | IDENTIFIED | 26.23 | <input type="checkbox"/> |  |
| Tin-126       | NR | 0.5994 | 0.0555   | pCi/g | 0.09506 | N    | 87.3  | 3 | 1.245  | IDENTIFIED | 7.87  | <input type="checkbox"/> |  |
| Total Uranium |    | 6.7231 | 1.89E-06 | ug/g  | 1.7491  | N    |       | 0 |        |            |       | <input type="checkbox"/> |  |
| Uranium-238   | HE | 2.276  | 0.6352   | pCi/g | 1.174   | N    | 63.04 | 2 | 0.9188 | IDENTIFIED | 26.23 | <input type="checkbox"/> |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 247970001 | 23-FEB-10 12:00 | 11-MAR-10 14:18 | 16.1      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004IGEL | N     | RGSP  |

| Name              | Result | Uncert. | Units    | MDA   | RDL     | Energy *** | FWHM  | Comb Act | Rpt Err(%) | Qual       | Qual Comment |                                     |  |
|-------------------|--------|---------|----------|-------|---------|------------|-------|----------|------------|------------|--------------|-------------------------------------|--|
| Actinium-228      | ✓      | 2.153   | 0.1984   | pCi/g | 0.1723  | N          | 910.4 | 3        | 1.8        | IDENTIFIED | 6.241        | <input type="checkbox"/>            |  |
| Annihilation Rad. | —      | 0.1604  | 0.0265   | pCi/g | 0.04015 | N          | 510.4 | 1        | 2.278      | IDENTIFIED | 16.19        | <input type="checkbox"/>            |  |
| Bismuth-211       | INT    | 4.405   | 0.235    | pCi/g | 0.2815  | Y          | 351.8 | 2        | 1.382      | IDENTIFIED | 4.262        | <input checked="" type="checkbox"/> | UI                                     |
| Bismuth-212       | —      | 2.338   | 0.3754   | pCi/g | 1.014   | N          | 0     | 5        | 0          | FAIL_ABUND | 0            | <input type="checkbox"/>            |  |
| Bismuth-214       | ✓      | 1.19    | 0.09562  | pCi/g | 0.1075  | 0.200      | 608.9 | 2        | 1.599      | IDENTIFIED | 6.663        | <input type="checkbox"/>            |  |
| Cadmium-109       | INT    | 3.505   | 0.5302   | pCi/g | 1.528   | Y          | 87.33 | 3        | 1.541      | IDENTIFIED | 14.41        | <input checked="" type="checkbox"/> | UI                                     |
| Cerium-143        | —      | 1382    | 185.6    | pCi/g | 0       | N          | 0     | 5        | 0          | SHORT_HLIF | 0            | <input type="checkbox"/>            |  |
| Cesium-134        | LA     | 0.1019  | 0.03152  | pCi/g | 0.0799  | 0.100      | 0     | 5        | 0          | FAIL_ABUND | 0            | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Europium-155      | HE     | 0.1648  | 0.05778  | pCi/g | 0.1601  | N          | 105.7 | 1        | 1.034      | IDENTIFIED | 34.89        | <input type="checkbox"/>            |  |
| Gross Gamma       | —      | 10.88   | 1.287    | pCi/g | 2.478   | N          |       | 0        |            |            |              | <input type="checkbox"/>            |  |
| Lead-212          | ✓      | 1.898   | 0.08578  | pCi/g | 0.08082 | 0.100      | 238.6 | 2        | 1.2        | IDENTIFIED | 2.726        | <input type="checkbox"/>            |  |
| Lead-214          | ✓      | 1.599   | 0.09603  | pCi/g | 0.1009  | 0.100      | 351.8 | 2        | 1.382      | IDENTIFIED | 4.262        | <input type="checkbox"/>            |  |
| Mercury-203       | INT    | 0.059   | 0.02453  | pCi/g | 0.05506 | 0.100      | 278   | 1        | 1.499      | IDENTIFIED | 41.47        | <input type="checkbox"/>            | UI                                     |
| Neptunium-237     | INT    | 1.021   | 0.1879   | pCi/g | 0.4284  | N          | 87.33 | 3        | 1.541      | IDENTIFIED | 14.41        | <input type="checkbox"/>            |  |
| Niobium-95        | HE     | 0.07099 | 0.02104  | pCi/g | 0.06821 | N          | 0     | 5        | 0          | NOT_IDENTI | 0            | <input type="checkbox"/>            |  |
| Potassium-40      | ✓      | 38.4    | 1.655    | pCi/g | 0.4321  | 1.00       | 1460  | 1        | 2.283      | IDENTIFIED | 2.039        | <input type="checkbox"/>            |  |
| Radium-224        | INT    | 4.737   | 0.568    | pCi/g | 0.8651  | Y          | 241.6 | 1        | 1.767      | IDENTIFIED | 11.66        | <input checked="" type="checkbox"/> | UI                                     |
| Radium-226        | ✓      | 1.19    | 0.09562  | pCi/g | 0.1075  | Y          | 608.9 | 2        | 1.599      | IDENTIFIED | 6.663        | <input type="checkbox"/>            |  |
| Radium-228        | ✓      | 2.153   | 0.1984   | pCi/g | 0.1723  | 0.500      | 910.4 | 3        | 1.8        | IDENTIFIED | 6.241        | <input type="checkbox"/>            |  |
| Strontium-85      | LA     | 0.07248 | 0.01942  | pCi/g | 0.06284 | Y          | 0     | 5        | 0          | NOT_IDENTI | 0            | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Thallium-208      | ✓      | 0.6023  | 0.0406   | pCi/g | 0.04554 | 0.080      | 582.7 | 1        | 1.487      | IDENTIFIED | 5.49         | <input type="checkbox"/>            |  |
| Thorium-228       | NR     | 1.898   | 0.08578  | pCi/g | 0.08082 | N          | 238.6 | 2        | 1.2        | IDENTIFIED | 2.726        | <input type="checkbox"/>            |  |
| Thorium-232       | NR     | 2.153   | 0.1984   | pCi/g | 0.1723  | N          | 910.4 | 3        | 1.8        | IDENTIFIED | 6.241        | <input type="checkbox"/>            |  |
| Tin-126           | NR     | 0.3421  | 0.05175  | pCi/g | 0.1484  | N          | 87.33 | 3        | 1.541      | IDENTIFIED | 14.41        | <input type="checkbox"/>            |  |
| Total Uranium     | —      | 4.515   | 2.24E-06 | ug/g  | 3.9778  | N          |       | 0        |            |            |              | <input type="checkbox"/>            |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 247970002 | 23-FEB-10 12:00 | 11-MAR-10 14:18 | 16.1      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004IGEL | N     | RGSP  |

| Name                 | Result  | Uncert. | Units | MDA     | RDL   | Energy *** | FWHM  | Comb Act   | Rpt Err(%) | Qual                                | Qual Comment                           |
|----------------------|---------|---------|-------|---------|-------|------------|-------|------------|------------|-------------------------------------|--|
| Actinium-228 ✓       | 2.004   | 0.283   | pCi/g | 0.3546  | N     | 910.9 3    | 1.155 | IDENTIFIED | 12.86      | <input type="checkbox"/>            |  |
| Annihilation Rad. HE | 0.09694 | 0.04926 | pCi/g | 0.06111 | N     | 511.1 1    | 1.531 | IDENTIFIED | 50.59      | <input type="checkbox"/>            |  |
| Bismuth-211 INT      | 4.563   | 0.3488  | pCi/g | 0.3067  | Y     | 351.7 2    | 1.176 | IDENTIFIED | 6.172      | <input checked="" type="checkbox"/> | UI                                     |
| Bismuth-214 ✓        | 1.189   | 0.1316  | pCi/g | 0.1392  | 0.200 | 609 2      | 1.073 | IDENTIFIED | 9.344      | <input type="checkbox"/>            |  |
| Cadmium-109 INT      | 3.719   | 0.4304  | pCi/g | 0.8558  | Y     | 87.23 3    | 0.941 | IDENTIFIED | 10.59      | <input checked="" type="checkbox"/> | UI                                     |
| Cerium-143 —         | 629.2   | 157.4   | pCi/g | 0       | N     | 0 4 0      |       | SHORT_HLIF | 0          | <input type="checkbox"/>            |  |
| Cesium-134 LA        | 0.184   | 0.04279 | pCi/g | 0.1388  | 0.100 | 0 4 0      |       | FAIL_ABUND | 0          | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Name              | Result | Uncert.    | Units   | MDA           | RDL   | Energy | ***FWHM | Comb Act | Rpt Err(%)       | Qual                                | Qual Comment                           |
|-------------------|--------|------------|---------|---------------|-------|--------|---------|----------|------------------|-------------------------------------|--|
| Actinium-228      | LA     | 2.305      | 0.2362  | pCi/g 0.6821  | N     | 0      | 9       | 0        | FAIL_ABUND 0     | <input type="checkbox"/>            |  |
| Annihilation Rad. | —      | 0.1853     | 0.04294 | pCi/g 0.05513 | N     | 510.9  | 1       | 1.327    | IDENTIFIED 22.77 | <input type="checkbox"/>            |  |
| Bismuth-211       | INT    | 4.9        | 0.3754  | pCi/g 0.4723  | Y     | 352    | 2       | 1.447    | IDENTIFIED 5.833 | <input checked="" type="checkbox"/> | UI                                     |
| Bismuth-212       | HE     | 2.278      | 0.676   | pCi/g 1.549   | N     | 0      | 9       | 0        | FAIL_ABUND 0     | <input type="checkbox"/>            |  |
| Bismuth-214       | ✓      | 1.357      | 0.1156  | pCi/g 0.1578  | 0.200 | 609.2  | 2       | 1.581    | IDENTIFIED 6.912 | <input type="checkbox"/>            |  |
| Cadmium-109       | INT    | 2.518      | 0.7798  | pCi/g 2.278   | Y     | 87.24  | 3       | 1.09     | IDENTIFIED 30.35 | <input checked="" type="checkbox"/> | UI                                     |
| Cerium-143        | —      | 1841       | 291.6   | pCi/g 0       | N     | 0      | 9       | 0        | SHORT_HLIF 0     | <input type="checkbox"/>            |  |
| Gross Gamma       | —      | 11.06      | 1.639   | pCi/g 3.349   | N     | 0      |         |          |                  | <input type="checkbox"/>            |  |
| Iodine-133        | HE     | 15090      | 9224    | pCi/g 0       | N     | 0      | 9       | 0        | SHORT_HLIF 0     | <input type="checkbox"/>            |  |
| Iodine-135        | —      | 1.32E+17 0 |         | pCi/g 0       | N     | 0      | 9       | 0        | SHORT_HLIF 0     | <input type="checkbox"/>            |  |
| Lead-212          | ✓      | 2.124      | 0.1493  | pCi/g 0.1338  | 0.100 | 238.7  | 2       | 1.412    | IDENTIFIED 3.706 | <input type="checkbox"/>            |  |
| Lead-214          | ✓      | 1.778      | 0.1448  | pCi/g 0.1662  | 0.100 | 352    | 2       | 1.447    | IDENTIFIED 5.833 | <input type="checkbox"/>            |  |
| Neptunium-237     | HE     | 0.7332     | 0.2397  | pCi/g 0.6024  | N     | 87.24  | 3       | 1.09     | IDENTIFIED 30.35 | <input type="checkbox"/>            |  |
| Niobium-95m       | —      | 0.6634     | 0.1115  | pCi/g 0.3591  | N     | 0      | 9       | 0        | NOT_IDENTI 0     | <input type="checkbox"/>            |  |
| Potassium-40      | ✓      | 39.76      | 2.275   | pCi/g 0.728   | 1.00  | 1460   | 1       | 1.906    | IDENTIFIED 2.932 | <input type="checkbox"/>            |  |
| Radium-224        | INT    | 4.61       | 0.8369  | pCi/g 1.433   | Y     | 241.6  | 1       | 1.65     | IDENTIFIED 17.3  | <input checked="" type="checkbox"/> | UI                                     |
| Radium-226        | ✓      | 1.357      | 0.1156  | pCi/g 0.1578  | Y     | 609.2  | 2       | 1.581    | IDENTIFIED 6.912 | <input type="checkbox"/>            |  |
| Radium-228        | LA     | 2.305      | 0.2362  | pCi/g 0.6821  | 0.500 | 0      | 9       | 0        | FAIL_ABUND 0     | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Strontium-85      | LA     | 0.1159     | 0.0301  | pCi/g 0.09839 | Y     | 0      | 9       | 0        | NOT_IDENTI 0     | <input checked="" type="checkbox"/> | UI Data rejected due to low abundance. |
| Thallium-208      | ✓      | 0.6676     | 0.06057 | pCi/g 0.07493 | 0.080 | 583.1  | 1       | 1.518    | IDENTIFIED 7.836 | <input type="checkbox"/>            |  |
| Thorium-228       | NR     | 2.124      | 0.1493  | pCi/g 0.1338  | N     | 238.7  | 2       | 1.412    | IDENTIFIED 3.706 | <input type="checkbox"/>            |  |
| Thorium-232       | NR     | 2.305      | 0.2362  | pCi/g 0.6821  | N     | 0      | 9       | 0        | FAIL_ABUND 0     | <input type="checkbox"/>            |  |
| Tin-126           | HE     | 0.2457     | 0.0761  | pCi/g 0.2126  | N     | 87.24  | 3       | 1.09     | IDENTIFIED 30.35 | <input type="checkbox"/>            |  |

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|                   |                 |                 |          |        |         |            |       |               |            |            |              |                                     |   |
|-------------------|-----------------|-----------------|----------|--------|---------|------------|-------|---------------|------------|------------|--------------|-------------------------------------|---|
| 247970004         | 23-FEB-10 12:00 | 11-MAR-10 18:12 | 16.3     | SAMPLE | LOAD    | 1          | LANL  | LANL01004IGEL | N          | RGSP       |              |                                     |   |
| Name              | Result          | Uncert.         | Units    | MDA    | RDL     | Energy *** | FWHM  | Comb Act      | Rpt Err(%) | Qual       | Qual Comment |                                     |   |
| Actinium-228      | ✓               | 1.533           | 0.1787   | pCi/g  | 0.2702  | N          | 910.2 | 3             | 1.4        | IDENTIFIED | 9.773        | <input type="checkbox"/>            |   |
| Annihilation Rad. | —               | 0.1542          | 0.03664  | pCi/g  | 0.04773 | N          | 510.3 | 1             | 2.182      | IDENTIFIED | 23.54        | <input type="checkbox"/>            |   |
| Bismuth-211       | INT             | 2.982           | 0.2604   | pCi/g  | 0.3253  | Y          | 351.5 | 2             | 1.39       | IDENTIFIED | 7.785        | <input checked="" type="checkbox"/> | ✓ |
| Bismuth-212       | —               | 2.416           | 0.495    | pCi/g  | 1.19    | N          | 0     | 6             | 0          | FAIL_ABUND | 0            | <input type="checkbox"/>            |   |
| Bismuth-214       | ✓               | 0.852           | 0.08833  | pCi/g  | 0.1111  | 0.200      | 608.4 | 2             | 1.184      | IDENTIFIED | 9.47         | <input type="checkbox"/>            |   |
| Cadmium-109       | INT             | 3.004           | 0.3923   | pCi/g  | 0.9763  | Y          | 86.76 | 3             | 1.326      | IDENTIFIED | 12.49        | <input checked="" type="checkbox"/> | ✓ |
| Cerium-143        | —               | 1891            | 312      | pCi/g  | 0       | N          | 0     | 6             | 0          | SHORT_HLIF | 0            | <input type="checkbox"/>            |   |
| Cesium-135        | HE              | 0.3079          | 0.09188  | pCi/g  | 0.3028  | N          | 0     | 6             | 0          | NOT_IDENTI | 0            | <input type="checkbox"/>            |   |
| Gadolinium-153    | HE              | 0.1378          | 0.03879  | pCi/g  | 0.1273  | N          | 0     | 6             | 0          | NOT_IDENTI | 0            | <input type="checkbox"/>            |   |
| Gross Gamma       | —               | 8.408           | 1.163    | pCi/g  | 3.829   | N          | 0     |               |            |            |              | <input type="checkbox"/>            |   |
| Iodine-133        | HE              | 2769            | 8391     | pCi/g  | 0       | N          | 0     | 6             | 0          | SHORT_HLIF | 0            | <input type="checkbox"/>            |   |
| Lead-212          | ✓               | 1.4             | 0.0924   | pCi/g  | 0.09936 | 0.100      | 238.2 | 2             | 1.238      | IDENTIFIED | 3.777        | <input type="checkbox"/>            |   |
| Lead-214          | ✓               | 1.082           | 0.0991   | pCi/g  | 0.1183  | 0.100      | 351.5 | 2             | 1.39       | IDENTIFIED | 7.785        | <input type="checkbox"/>            |   |
| Neptunium-237     | INT             | 0.8746          | 0.1465   | pCi/g  | 0.2831  | N          | 86.76 | 3             | 1.326      | IDENTIFIED | 12.49        | <input type="checkbox"/>            |   |
| Niobium-95        | HE              | 0.1097          | 0.02742  | pCi/g  | 0.0726  | N          | 767.3 | 1             | 0.8079     | IDENTIFIED | 24.66        | <input type="checkbox"/>            |   |
| Niobium-95m       | —               | 1.117           | 0.1042   | pCi/g  | 0.3294  | N          | 0     | 6             | 0          | NOT_IDENTI | 0            | <input type="checkbox"/>            |   |
| Potassium-40      | ✓               | 29.57           | 1.277    | pCi/g  | 0.4642  | 1.00       | 1459  | 1             | 2.052      | IDENTIFIED | 2.996        | <input type="checkbox"/>            |   |
| Radium-224        | INT             | 3.218           | 0.5805   | pCi/g  | 1.065   | Y          | 241.2 | 1             | 1.7        | IDENTIFIED | 17.36        | <input checked="" type="checkbox"/> | ✓ |
| Radium-226        | ✓               | 0.852           | 0.08833  | pCi/g  | 0.1111  | Y          | 608.4 | 2             | 1.184      | IDENTIFIED | 9.47         | <input type="checkbox"/>            |   |
| Radium-228        | ✓               | 1.533           | 0.1787   | pCi/g  | 0.2702  | 0.500      | 910.2 | 3             | 1.4        | IDENTIFIED | 9.773        | <input type="checkbox"/>            |   |
| Thallium-208      | ✓               | 0.4188          | 0.04795  | pCi/g  | 0.06203 | 0.080      | 582.6 | 1             | 1.452      | IDENTIFIED | 10.84        | <input type="checkbox"/>            |   |
| Thorium-228       | NR              | 1.4             | 0.0924   | pCi/g  | 0.09936 | N          | 238.2 | 2             | 1.238      | IDENTIFIED | 3.777        | <input type="checkbox"/>            |   |
| Thorium-232       | NR              | 1.533           | 0.1787   | pCi/g  | 0.2702  | N          | 910.2 | 3             | 1.4        | IDENTIFIED | 9.773        | <input type="checkbox"/>            |   |
| Tin-126           | NR              | 0.2931          | 0.03828  | pCi/g  | 0.09515 | N          | 86.76 | 3             | 1.326      | IDENTIFIED | 12.49        | <input type="checkbox"/>            |   |
| Total Uranium     | ✓               | 3.03            | 1.43E-06 | ug/g   | 1.6009  | N          | 0     |               |            |            |              | <input type="checkbox"/>            |   |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID         | Collect Date    | Run Date        | Days Past | Sample Type | Status  | Instance   | Client | Project       | Quals      | Zero?      | queue        |                                     |   |
|-------------------|-----------------|-----------------|-----------|-------------|---------|------------|--------|---------------|------------|------------|--------------|-------------------------------------|---|
| 247970005         | 23-FEB-10 12:00 | 11-MAR-10 19:25 | 16.3      | SAMPLE      | LOAD    | 1          | LANL   | LANL01004IGEL | N          |            | RGSP         |                                     |   |
| Name              | Result          | Uncert.         | Units     | MDA         | RDL     | Energy *** | FWHM   | Comb Act      | Rpt Err(%) | Qual       | Qual Comment |                                     |   |
| Actinium-228      | ✓               | 2.033           | 0.2017    | pCi/g       | 0.2068  | N          | 911.7  | 3             | 1.445      | IDENTIFIED | 8.165        | <input type="checkbox"/>            |   |
| Annihilation Rad. | HE              | 0.09926         | 0.03323   | pCi/g       | 0.04895 | N          | 511.1  | 1             | 1.253      | IDENTIFIED | 33.36        | <input type="checkbox"/>            |   |
| Bismuth-211       | INT             | 3.383           | 0.2371    | pCi/g       | 0.32    | Y          | 352    | 2             | 1.199      | IDENTIFIED | 6.142        | <input checked="" type="checkbox"/> | ✓ |
| Bismuth-212       | —               | 2.316           | 0.5049    | pCi/g       | 1.251   | N          | 0      | 5             | 0          | FAIL_ABUND | 0            | <input type="checkbox"/>            |   |
| Bismuth-214       | ✓               | 1.195           | 0.09606   | pCi/g       | 0.1164  | 0.200      | 609.7  | 2             | 1.386      | IDENTIFIED | 7.133        | <input type="checkbox"/>            |   |
| Cadmium-109       | INT             | 3.424           | 0.6306    | pCi/g       | 1.577   | Y          | 87.28  | 3             | 1.112      | IDENTIFIED | 17.41        | <input checked="" type="checkbox"/> | ✓ |
| Cerium-143        | —               | 767.2           | 164.5     | pCi/g       | 0       | N          | 0      | 5             | 0          | SHORT_HLIF | 0            | <input type="checkbox"/>            |   |
| Gross Gamma       | ✓               | 10.35           | 1.457     | pCi/g       | 2.968   | N          | 0      |               |            |            |              | <input type="checkbox"/>            |   |
| Iodine-133        | HE              | 9475            | 8813      | pCi/g       | 0       | N          | 0      | 5             | 0          | SHORT_HLIF | 0            | <input type="checkbox"/>            |   |
| Lead-212          | ✓               | 1.881           | 0.09797   | pCi/g       | 0.09099 | 0.100      | 238.7  | 2             | 1.119      | IDENTIFIED | 3.282        | <input type="checkbox"/>            |   |
| Lead-214          | ✓               | 1.228           | 0.09247   | pCi/g       | 0.1328  | 0.100      | 352    | 2             | 1.199      | IDENTIFIED | 6.142        | <input type="checkbox"/>            |   |
| Mercury-203       | INT             | 0.105           | 0.02993   | pCi/g       | 0.06341 | 0.100      | 278    | 1             | 2.669      | IDENTIFIED | 28.29        | <input checked="" type="checkbox"/> | ✓ |
| Neptunium-237     | INT             | 0.997           | 0.2113    | pCi/g       | 0.4609  | N          | 87.28  | 3             | 1.112      | IDENTIFIED | 17.41        | <input type="checkbox"/>            |   |
| Potassium-40      | ✓               | 36.43           | 1.642     | pCi/g       | 0.5766  | 1.00       | 1462   | 1             | 1.97       | IDENTIFIED | 2.77         | <input type="checkbox"/>            |   |
| Radium-224        | INT             | 5.798           | 0.7621    | pCi/g       | 0.9754  | Y          | 241.9  | 1             | 2.053      | IDENTIFIED | 12.71        | <input checked="" type="checkbox"/> | ✓ |



|                |    |          |          |       |         |       |       |   |       |            |       |                          |  |
|----------------|----|----------|----------|-------|---------|-------|-------|---|-------|------------|-------|--------------------------|--|
| Radium-226     | ✓  | 1.195    | 0.09606  | pCi/g | 0.1164  | Y     | 609.7 | 2 | 1.386 | IDENTIFIED | 7.133 | <input type="checkbox"/> |  |
| Radium-228     | ✓  | 2.033    | 0.2017   | pCi/g | 0.2068  | 0.500 | 911.7 | 3 | 1.445 | IDENTIFIED | 8.165 | <input type="checkbox"/> |  |
| Sodium-24      | HE | 4.91E+05 | 1.46E+06 | pCi/g | 0       | N     | 0     | 5 | 0     | SHORT_HLIF | 0     | <input type="checkbox"/> |  |
| Technetium-99m | ✓  | 2.48E+17 | 0        | pCi/g | 0       | N     | 0     | 5 | 0     | SHORT_HLIF | 0     | <input type="checkbox"/> |  |
| Thallium-208   | ✓  | 0.6247   | 0.04537  | pCi/g | 0.06132 | 0.080 | 583.4 | 1 | 1.368 | IDENTIFIED | 6.551 | <input type="checkbox"/> |  |
| Thorium-228    | NR | 1.881    | 0.09797  | pCi/g | 0.09099 | N     | 238.7 | 2 | 1.119 | IDENTIFIED | 3.282 | <input type="checkbox"/> |  |
| Thorium-232    | NR | 2.033    | 0.2017   | pCi/g | 0.2068  | N     | 911.7 | 3 | 1.445 | IDENTIFIED | 8.165 | <input type="checkbox"/> |  |
| Tin-126        | NR | 0.3341   | 0.06153  | pCi/g | 0.155   | N     | 87.28 | 3 | 1.112 | IDENTIFIED | 17.41 | <input type="checkbox"/> |  |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 247970006 | 23-FEB-10 12:00 | 11-MAR-10 19:25 | 16.3      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004GEL  | N     | RGSP  |

| Name              | Result | Uncert.  | Units    | MDA   | RDL     | Energy | *** FWHM | Comb Act | Rpt Err(%) | Qual       | Qual Comment |                                     |    |
|-------------------|--------|----------|----------|-------|---------|--------|----------|----------|------------|------------|--------------|-------------------------------------|----|
| Actinium-228      | ✓      | 1.827    | 0.2161   | pCi/g | 0.2854  | N      | 911.4    | 3        | 1.732      | IDENTIFIED | 10.18        | <input type="checkbox"/>            |    |
| Annihilation Rad. | —      | 0.1792   | 0.03989  | pCi/g | 0.0521  | N      | 511      | 1        | 1.793      | IDENTIFIED | 21.83        | <input type="checkbox"/>            |    |
| Bismuth-211       | INT    | 3.688    | 0.3034   | pCi/g | 0.3692  | Y      | 351.9    | 2        | 1.226      | IDENTIFIED | 6.759        | <input checked="" type="checkbox"/> | UI |
| Bismuth-212       | HE     | 2.082    | 0.4709   | pCi/g | 1.403   | N      | 0        | 4        | 0          | FAIL_ABUND | 0            | <input type="checkbox"/>            |    |
| Bismuth-214       | ✓      | 1.1      | 0.1101   | pCi/g | 0.1295  | 0.200  | 609.5    | 2        | 1.758      | IDENTIFIED | 8.696        | <input type="checkbox"/>            |    |
| Cadmium-109       | INT    | 3.079    | 0.5945   | pCi/g | 1.514   | Y      | 87.15    | 3        | 1.152      | IDENTIFIED | 18.5         | <input checked="" type="checkbox"/> | UI |
| Cerium-143        | —      | 870.1    | 202.1    | pCi/g | 0       | N      | 0        | 4        | 0          | SHORT_HLIF | 0            | <input type="checkbox"/>            |    |
| Gross Gamma       | —      | 9.318    | 1.414    | pCi/g | 3.349   | N      | 0        |          |            |            |              | <input type="checkbox"/>            |    |
| Iodine-135        | —      | 7.25E+16 | 0        | pCi/g | 0       | N      | 0        | 4        | 0          | SHORT_HLIF | 0            | <input type="checkbox"/>            |    |
| Lead-212          | ✓      | 1.836    | 0.1161   | pCi/g | 0.113   | 0.100  | 238.7    | 2        | 1.142      | IDENTIFIED | 3.696        | <input type="checkbox"/>            |    |
| Lead-214          | ✓      | 1.339    | 0.1161   | pCi/g | 0.148   | 0.100  | 351.9    | 2        | 1.226      | IDENTIFIED | 6.759        | <input type="checkbox"/>            |    |
| Neptunium-237     | INT    | 0.8965   | 0.197    | pCi/g | 0.4426  | N      | 87.15    | 3        | 1.152      | IDENTIFIED | 18.5         | <input type="checkbox"/>            |    |
| Potassium-40      | ✓      | 33.04    | 1.875    | pCi/g | 0.5995  | 1.00   | 1461     | 1        | 2.16       | IDENTIFIED | 3.159        | <input type="checkbox"/>            |    |
| Radium-224        | INT    | 3.677    | 0.5627   | pCi/g | 1.211   | Y      | 241.8    | 1        | 1.38       | IDENTIFIED | 14.6         | <input checked="" type="checkbox"/> | UI |
| Radium-226        | ✓      | 1.1      | 0.1101   | pCi/g | 0.1295  | Y      | 609.5    | 2        | 1.758      | IDENTIFIED | 8.696        | <input type="checkbox"/>            |    |
| Radium-228        | ✓      | 1.827    | 0.2161   | pCi/g | 0.2854  | 0.500  | 911.4    | 3        | 1.732      | IDENTIFIED | 10.18        | <input type="checkbox"/>            |    |
| Sodium-24         | HE     | 1.36E+05 | 1.64E+06 | pCi/g | 0       | N      | 0        | 4        | 0          | SHORT_HLIF | 0            | <input type="checkbox"/>            |    |
| Thallium-208      | ✓      | 0.5407   | 0.05323  | pCi/g | 0.06211 | 0.080  | 583.3    | 1        | 1.42       | IDENTIFIED | 8.723        | <input type="checkbox"/>            |    |
| Thorium-228       | NR     | 1.836    | 0.1161   | pCi/g | 0.113   | N      | 238.7    | 2        | 1.142      | IDENTIFIED | 3.696        | <input type="checkbox"/>            |    |
| Thorium-232       | NR     | 1.827    | 0.2161   | pCi/g | 0.2854  | N      | 911.4    | 3        | 1.732      | IDENTIFIED | 10.18        | <input type="checkbox"/>            |    |
| Tin-126           | NR     | 0.3004   | 0.05801  | pCi/g | 0.1607  | N      | 87.15    | 3        | 1.152      | IDENTIFIED | 18.5         | <input type="checkbox"/>            |    |
| Total Uranium     | —      | 7.57     | 3.22E-06 | ug/g  | 4.1235  | N      | 0        |          |            |            |              | <input type="checkbox"/>            |    |

\*\*\* = Number of isotopes identified with a keyline at this energy.

| Sample ID | Collect Date    | Run Date        | Days Past | Sample Type | Status | Instance | Client | Project Quals | Zero? | queue |
|-----------|-----------------|-----------------|-----------|-------------|--------|----------|--------|---------------|-------|-------|
| 247970007 | 23-FEB-10 12:00 | 11-MAR-10 19:26 | 16.3      | SAMPLE      | LOAD   | 1        | LANL   | LANL01004GEL  | N     | RGSP  |

| Name              | Result | Uncert. | Units   | MDA           | RDL   | Energy *** | FWHM | Comb Act Rpt | Err(%)     | Qual  | Qual Comment  |
|-------------------|--------|---------|---------|---------------|-------|------------|------|--------------|------------|-------|---|
| Actinium-228      | ✓      | 2.022   | 0.2022  | pCi/g 0.2111  | N     | 911.9      | 3    | 1.532        | IDENTIFIED | 7.968 | <input type="checkbox"/> <input type="checkbox"/>                       |
| Annihilation Rad. | HE     | 0.1074  | 0.03311 | pCi/g 0.04703 | N     | 511.1      | 1    | 1.728        | IDENTIFIED | 30.68 | <input type="checkbox"/> <input type="checkbox"/>                       |
| Bismuth-211       | INT    | 3.676   | 0.2259  | pCi/g 0.3184  | Y     | 351.9      | 2    | 1.439        | IDENTIFIED | 5.268 | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> |
| Bismuth-212       | ✓      | 1.849   | 0.3838  | pCi/g 0.7936  | N     | 727.8      | 1    | 2.027        | IDENTIFIED | 19.97 | <input type="checkbox"/> <input type="checkbox"/>                       |
| Bismuth-214       | ✓      | 1.075   | 0.09589 | pCi/g 0.1045  | 0.200 | 609.7      | 2    | 1.99         | IDENTIFIED | 7.978 | <input type="checkbox"/> <input type="checkbox"/>                       |
| Cadmium-109       | INT    | 2.532   | 0.4244  | pCi/g 1.395   | Y     | 87.34      | 3    | 1.146        | IDENTIFIED | 16.19 | <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> |
| Cerium-143        | —      | 1837    | 247.1   | pCi/g 0       | N     | 0          | 7    | 0            | SHORT HLIF | 0     | <input type="checkbox"/> <input type="checkbox"/>                       |







# Result Greater Than DL

| Batch Id | Sample Id  | Sample Type | Run Date  | Paramname      | Result   | Uncertainty | Units | DL      | RDL   |
|----------|------------|-------------|-----------|----------------|----------|-------------|-------|---------|-------|
| 958216   | 247970007  | SAMPLE      | 11-MAR-10 | Thallium-208   | 0.5855   | 0.04499     | pCi/g | 0.02493 | 0.080 |
|          |            |             |           | Thorium-234    | 2.524    | 0.7416      | pCi/g | 0.9492  | 2.00  |
| 958216   | 1202054948 | MB          | 11-MAR-10 | Sodium-24      | 68.33    | 496.9       | pCi/g | 0       | N     |
| 958216   | 1202054949 | DUP         | 11-MAR-10 | Bismuth-211    | 3.755    | 0.2725      | pCi/g | 0.204   | Y     |
|          |            |             |           | Bismuth-214    | 1.247    | 0.1139      | pCi/g | 0.0696  | 0.200 |
|          |            |             |           | Cadmium-109    | 3.953    | 0.6649      | pCi/g | 0.727   | Y     |
|          |            |             |           | Cerium-143     | 2049     | 323.1       | pCi/g | 0       | N     |
|          |            |             |           | Cesium-134     | 0.09409  | 0.02984     | pCi/g | 0.0509  | 0.100 |
|          |            |             |           | Gross Gamma    | 10.45    | 1.5         | pCi/g | 1.798   | N     |
|          |            |             |           | Iodine-133     | 587.6    | 9577        | pCi/g | 0       | N     |
|          |            |             |           | Lead-212       | 1.841    | 0.09145     | pCi/g | 0.05383 | 0.100 |
|          |            |             |           | Lead-214       | 1.363    | 0.1058      | pCi/g | 0.07281 | 0.100 |
|          |            |             |           | Potassium-40   | 35.44    | 1.69        | pCi/g | 0.3145  | 1.00  |
|          |            |             |           | Radium-224     | 4.902    | 0.7189      | pCi/g | 0.577   | Y     |
|          |            |             |           | Radium-226     | 1.247    | 0.1139      | pCi/g | 0.0696  | Y     |
|          |            |             |           | Radium-228     | 2.217    | 0.2252      | pCi/g | 0.1395  | 0.500 |
|          |            |             |           | Thallium-208   | 0.6016   | 0.05294     | pCi/g | 0.03299 | 0.080 |
|          |            |             |           | Thorium-234    | 2.302    | 0.9619      | pCi/g | 1.705   | 2.00  |
| 958216   | 1202054950 | LCS         | 11-MAR-10 | Americium-241  | 13.38    | 0.5938      | pCi/g | 0.0929  | 0.200 |
|          |            |             |           | Barium-137m    | 5.726    | 0.3523      | pCi/g | 0.06799 | N     |
|          |            |             |           | Bismuth-211    | 2.122    | 0.3455      | pCi/g | 0.3183  | Y     |
|          |            |             |           | Bismuth-214    | 0.9401   | 0.1384      | pCi/g | 0.2041  | 0.200 |
|          |            |             |           | Cadmium-109    | 31.29    | 1.759       | pCi/g | 0.6213  | Y     |
|          |            |             |           | Cerium-143     | 23.36    | 7.911       | pCi/g | 13.05   | N     |
|          |            |             |           | Cesium-137     | 6.049    | 0.3726      | pCi/g | 0.07182 | 0.100 |
|          |            |             |           | Cobalt-60      | 6.615    | 0.3404      | pCi/g | 0.05015 | 0.100 |
|          |            |             |           | Gross Gamma    | 27.76    | 2.589       | pCi/g | 1.762   | N     |
|          |            |             |           | Lead-212       | 1.118    | 0.08815     | pCi/g | 0.07769 | 0.100 |
|          |            |             |           | Lead-214       | 0.7703   | 0.1272      | pCi/g | 0.1159  | 0.100 |
|          |            |             |           | Neptunium-237  | 9.198    | 1.094       | pCi/g | 0.2028  | N     |
|          |            |             |           | Potassium-40   | 1.284    | 0.3368      | pCi/g | 0.7266  | 1.00  |
|          |            |             |           | Radium-224     | 2.547    | 0.7198      | pCi/g | 0.8349  | Y     |
|          |            |             |           | Radium-226     | 0.9401   | 0.1384      | pCi/g | 0.2041  | Y     |
|          |            |             |           | Radium-228     | 1.972    | 0.448       | pCi/g | 0.4712  | 0.500 |
|          |            |             |           | Technetium-99m | 1.59E+10 | 1.03E+10    | pCi/g | 0       | N     |
|          |            |             |           | Thallium-208   | 0.3372   | 0.0719      | pCi/g | 0.05742 | 0.080 |
|          |            |             |           | Uranium-235    | 0.4451   | 0.159       | pCi/g | 0.1997  | 0.500 |

403/16/10

403/16/10

VAX/VMS Nuclide Identification Report Generated 10-MAR-2010 23:17:37.23

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29414                             *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964001.CNF;1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 21:17:10
Sample ID        : G247964001 Sample quantity : 1.36530E+02 GRAM
Detector name    : GAM16 Detector geometry: CAN
Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:02.63 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 5.00000
Batch ID        : 958216 Detector SN# :
Matrix Spike ID : LCS ID : 1032-A
*****

```

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|------|----|----------|------|----------|
| 1  | 4  | 74.87*   | 713  | 619   | 0.98 | 149.92  | 144  | 17 | 9.90E-02 | 6.7  | 3.61E+00 |
| 2  | 4  | 77.13*   | 1096 | 556   | 0.92 | 154.44  | 144  | 17 | 1.52E-01 | 4.6  |          |
| 3  | 4  | 87.20*   | 444  | 632   | 1.27 | 174.59  | 164  | 27 | 6.17E-02 | 10.9 | 1.57E+00 |
| 4  | 4  | 89.88    | 311  | 451   | 0.97 | 179.95  | 164  | 27 | 4.31E-02 | 12.3 |          |
| 5  | 4  | 92.81*   | 493  | 565   | 1.26 | 185.82  | 164  | 27 | 6.84E-02 | 10.1 |          |
| 6  | 0  | 105.75   | 107  | 469   | 1.92 | 211.70  | 207  | 8  | 1.49E-02 | 36.3 |          |
| 7  | 0  | 128.78   | 74   | 541   | 0.98 | 257.76  | 255  | 8  | 1.03E-02 | 55.2 |          |
| 8  | 0  | 144.05*  | 108  | 434   | 0.90 | 288.28  | 285  | 8  | 1.50E-02 | 35.6 |          |
| 9  | 0  | 185.82*  | 380  | 535   | 1.34 | 371.83  | 366  | 10 | 5.27E-02 | 12.8 |          |
| 10 | 0  | 209.34*  | 196  | 486   | 0.93 | 418.88  | 415  | 10 | 2.72E-02 | 22.5 |          |
| 11 | 6  | 238.58*  | 2135 | 250   | 0.99 | 477.35  | 472  | 19 | 2.97E-01 | 2.5  | 3.32E+00 |
| 12 | 6  | 241.64   | 631  | 303   | 1.68 | 483.47  | 472  | 19 | 8.76E-02 | 8.4  |          |
| 13 | 0  | 270.39   | 188  | 280   | 1.23 | 540.98  | 536  | 10 | 2.61E-02 | 18.2 |          |
| 14 | 0  | 278.12   | 86   | 353   | 1.27 | 556.43  | 550  | 12 | 1.20E-02 | 44.9 |          |
| 15 | 0  | 295.19*  | 696  | 283   | 1.11 | 590.56  | 585  | 11 | 9.66E-02 | 6.1  |          |
| 16 | 0  | 300.51   | 210  | 293   | 1.13 | 601.20  | 596  | 12 | 2.92E-02 | 17.7 |          |
| 17 | 0  | 328.23   | 97   | 203   | 1.21 | 656.64  | 652  | 9  | 1.34E-02 | 28.5 |          |
| 18 | 0  | 338.24   | 392  | 262   | 1.01 | 676.66  | 672  | 10 | 5.45E-02 | 9.2  |          |
| 19 | 0  | 351.83*  | 1160 | 213   | 1.10 | 703.84  | 698  | 10 | 1.61E-01 | 3.8  |          |
| 20 | 0  | 409.33   | 61   | 85    | 1.00 | 818.84  | 816  | 6  | 8.53E-03 | 26.9 |          |
| 21 | 0  | 462.99   | 106  | 157   | 1.18 | 926.15  | 921  | 10 | 1.48E-02 | 24.1 |          |
| 22 | 0  | 510.43*  | 195  | 164   | 1.78 | 1021.01 | 1015 | 13 | 2.71E-02 | 17.0 |          |
| 23 | 0  | 562.66   | 43   | 114   | 1.12 | 1125.47 | 1119 | 10 | 5.99E-03 | 48.9 |          |
| 24 | 0  | 583.11*  | 696  | 154   | 1.22 | 1166.35 | 1159 | 14 | 9.67E-02 | 5.4  |          |
| 25 | 0  | 609.34*  | 812  | 151   | 1.29 | 1218.82 | 1212 | 12 | 1.13E-01 | 4.7  |          |
| 26 | 0  | 727.55   | 149  | 81    | 1.16 | 1455.19 | 1449 | 10 | 2.07E-02 | 13.9 |          |
| 27 | 0  | 768.33   | 68   | 134   | 1.01 | 1536.74 | 1531 | 12 | 9.48E-03 | 36.3 |          |
| 28 | 0  | 794.87*  | 57   | 79    | 1.40 | 1589.81 | 1585 | 9  | 7.98E-03 | 32.0 |          |
| 29 | 0  | 860.56   | 126  | 76    | 1.64 | 1721.15 | 1714 | 16 | 1.75E-02 | 17.9 |          |
| 30 | 0  | 911.39*  | 422  | 93    | 1.78 | 1822.78 | 1817 | 15 | 5.86E-02 | 7.0  |          |
| 31 | 0  | 934.70   | 38   | 104   | 1.74 | 1869.39 | 1863 | 15 | 5.32E-03 | 60.4 |          |
| 32 | 0  | 964.88   | 71   | 60    | 1.30 | 1929.73 | 1925 | 9  | 9.83E-03 | 23.1 |          |
| 33 | 0  | 969.03*  | 230  | 73    | 1.72 | 1938.04 | 1933 | 10 | 3.20E-02 | 9.7  |          |
| 34 | 0  | 1120.51* | 189  | 74    | 1.55 | 2240.91 | 2235 | 15 | 2.63E-02 | 12.3 |          |
| 35 | 0  | 1238.38* | 63   | 98    | 1.75 | 2476.55 | 2469 | 14 | 8.73E-03 | 36.0 |          |
| 36 | 0  | 1378.48  | 36   | 48    | 1.58 | 2756.64 | 2748 | 16 | 5.00E-03 | 46.1 |          |
| 37 | 0  | 1460.95* | 1762 | 48    | 1.79 | 2921.50 | 2914 | 15 | 2.45E-01 | 2.5  |          |
| 38 | 0  | 1589.62  | 108  | 12    | 4.41 | 3178.71 | 3169 | 24 | 1.50E-02 | 12.8 |          |

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit |
|----|----|----------|------|-------|------|---------|------|----|----------|------|-----|
| 39 | 0  | 1620.84  | 21   | 15    | 2.05 | 3241.12 | 3233 | 12 | 2.90E-03 | 43.1 |     |
| 40 | 0  | 1730.08  | 37   | 13    | 1.57 | 3459.49 | 3453 | 13 | 5.14E-03 | 26.0 |     |
| 41 | 0  | 1764.71* | 174  | 7     | 2.42 | 3528.69 | 3522 | 14 | 2.41E-02 | 8.4  |     |
| 42 | 0  | 1847.56  | 44   | 3     | 2.03 | 3694.29 | 3688 | 13 | 6.07E-03 | 17.4 |     |

Flag: "\*" = Peak area was modified by background subtraction

## VMS Nuclide Identification Report V3.1 Generated 10-MAR-2010 23:17:39

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964001.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8
Sample title      : MXR1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 21:17:10
Sample ID         : G247964001 Sample quantity : 136.53 GRAM
Sample type       : SOLID Sample geometry :
Detector name     : GAMMA16 Detector geometry: CAN
Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:02.63 0.0%
Peak Width (FWHM): 3.00 Confidence level : 5.00 %
Energy tolerance : 1.50 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 0.00 %
Efficiency type : Empirical Efficiencies at : Peak Energy
Abundance limit : 75.00 WTM error limit : 3.00

```

## Full Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| K-40    | +         | 1460.82      | *   | 3.763E+01           | 3.824E+00 | 5.722E-01      | 5.030E-02 | 65.770  |
| CD-109  | +         | 88.03        | *   | 5.435E+00           | 1.293E+00 | 1.169E+00      | 1.126E-01 | 4.651   |
| SN-126  |           | 64.28        |     | 4.695E-01           | 5.275E-01 | 8.445E-01      | 1.230E-01 | 0.556   |
|         | +         | 86.94        |     | 2.195E+00           | 1.030E+00 | 4.770E-01      | 1.982E-01 | 4.601   |
|         | +         | 87.57        | *   | 5.279E-01           | 1.255E-01 | 1.140E-01      | 1.093E-02 | 4.630   |
| CE-141  | +         | 145.44       | *   | 1.338E-01           | 9.607E-02 | 1.055E-01      | 9.227E-03 | 1.269   |
| EU-155  | +         | 86.55        |     | 6.412E-01           | 1.527E-01 | 1.399E-01      | 1.336E-02 | 4.582   |
|         | +         | 105.31       | *   | 1.994E-01           | 1.459E-01 | 1.660E-01      | 1.435E-02 | 1.201   |
| HG-203  |           | 70.83        |     | 4.651E-01           | 1.479E+00 | 2.313E+00      | 3.636E-01 | 0.201   |
|         |           | 72.87        |     | 6.605E-01           | 8.641E-01 | 1.363E+00      | 2.081E-01 | 0.485   |
|         | +         | 279.20       | *   | 8.283E-02           | 7.511E-02 | 6.460E-02      | 7.861E-03 | 1.282   |
| TL-208  | +         | 277.37       |     | 7.666E-01           | 6.985E-01 | 5.945E-01      | 8.934E-02 | 1.289   |
|         | +         | 583.19       | *   | 8.439E-01           | 1.240E-01 | 5.883E-02      | 5.825E-03 | 14.345  |
|         | +         | 860.56       |     | 1.440E+00           | 5.354E-01 | 4.618E-01      | 4.621E-02 | 3.118   |
| BI-211  |           | 72.87        |     | 2.490E+00           | 3.241E+00 | 5.136E+00      | 4.175E-01 | 0.485   |
|         | +         | 351.06       | *   | 6.262E+00           | 8.331E-01 | 3.234E-01      | 3.537E-02 | 19.363  |
| BI-212  | +         | 727.33       | *   | 2.764E+00           | 8.475E-01 | 7.590E-01      | 9.726E-02 | 3.641   |
|         |           | 785.37       |     | 2.176E+00           | 3.328E+00 | 5.837E+00      | 5.425E-01 | 0.373   |
|         | +         | 1620.50      |     | 3.494E+00           | 3.029E+00 | 3.596E+00      | 3.055E-01 | 0.972   |
| PB-212  | +         | 74.82        |     | 3.730E+00           | 6.913E-01 | 5.599E-01      | 7.157E-02 | 6.662   |
|         | +         | 77.11        |     | 3.286E+00           | 4.132E-01 | 3.213E-01      | 2.729E-02 | 10.226  |
|         | +         | 238.63       | *   | 2.576E+00           | 3.317E-01 | 9.276E-02      | 1.102E-02 | 27.776  |
|         | +         | 300.09       |     | 3.958E+00           | 1.495E+00 | 1.154E+00      | 1.522E-01 | 3.431   |
| BI-214  | +         | 609.32       | *   | 1.908E+00           | 2.702E-01 | 1.080E-01      | 1.147E-02 | 17.665  |
|         | +         | 1120.29      |     | 2.302E+00           | 6.194E-01 | 4.616E-01      | 4.978E-02 | 4.987   |
|         | +         | 1764.49      |     | 2.959E+00           | 5.551E-01 | 2.485E-01      | 2.057E-02 | 11.903  |
| PB-214  | +         | 74.82        |     | 6.612E+00           | 1.167E+00 | 9.924E-01      | 1.139E-01 | 6.662   |
|         | +         | 77.11        |     | 5.793E+00           | 8.711E-01 | 5.665E-01      | 6.707E-02 | 10.226  |
|         | +         | 242.00       |     | 4.620E+00           | 9.637E-01 | 5.643E-01      | 7.039E-02 | 8.188   |
|         | +         | 295.22       |     | 2.314E+00           | 4.196E-01 | 2.028E-01      | 2.732E-02 | 11.413  |
|         | +         | 351.93       | *   | 2.273E+00           | 3.273E-01 | 1.182E-01      | 1.445E-02 | 19.229  |
| RA-224  | +         | 240.99       | *   | 8.170E+00           | 1.637E+00 | 9.944E-01      | 1.096E-01 | 8.216   |
| RA-226  | +         | 609.32       | *   | 1.908E+00           | 2.702E-01 | 1.080E-01      | 1.147E-02 | 17.665  |
|         | +         | 1120.29      |     | 2.302E+00           | 6.194E-01 | 4.616E-01      | 4.978E-02 | 4.987   |

---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| AC-228  | +         | 1764.49      |     | 2.959E+00           | 5.551E-01 | 2.485E-01      | 2.057E-02 | 11.903  |
|         | +         | 338.32       |     | 2.358E+00           | 1.087E+00 | 3.749E-01      | 1.584E-01 | 6.289   |
|         | +         | 911.20       | *   | 2.467E+00           | 4.585E-01 | 2.270E-01      | 2.772E-02 | 10.866  |
| RA-228  | +         | 968.97       |     | 2.320E+00           | 7.267E-01 | 3.893E-01      | 9.575E-02 | 5.959   |
|         | +         | 338.32       |     | 2.358E+00           | 1.087E+00 | 3.749E-01      | 1.584E-01 | 6.289   |
|         | +         | 911.20       | *   | 2.467E+00           | 4.585E-01 | 2.270E-01      | 2.772E-02 | 10.866  |
| TH-228  | +         | 968.97       |     | 2.320E+00           | 7.267E-01 | 3.893E-01      | 9.575E-02 | 5.959   |
|         | +         | 74.82        |     | 3.730E+00           | 5.900E-01 | 5.599E-01      | 4.688E-02 | 6.662   |
|         | +         | 77.11        |     | 3.286E+00           | 4.132E-01 | 3.213E-01      | 2.729E-02 | 10.226  |
| TH-232  | +         | 238.63       | *   | 2.576E+00           | 3.317E-01 | 9.276E-02      | 1.102E-02 | 27.776  |
|         | +         | 300.09       |     | 3.958E+00           | 2.816E+00 | 1.154E+00      | 7.121E-01 | 3.431   |
|         | +         | 338.32       |     | 2.358E+00           | 5.048E-01 | 3.749E-01      | 4.092E-02 | 6.289   |
| U-235   | +         | 911.20       | *   | 2.467E+00           | 4.585E-01 | 2.270E-01      | 2.772E-02 | 10.866  |
|         | +         | 968.97       |     | 2.320E+00           | 7.267E-01 | 3.893E-01      | 9.575E-02 | 5.959   |
|         | +         | 89.96        |     | 3.826E+00           | 1.341E+00 | 1.189E+00      | 2.963E-01 | 3.217   |
|         | +         | 93.35        |     | 3.667E+00           | 1.131E+00 | 7.185E-01      | 1.674E-01 | 5.103   |
|         | +         | 143.76       | *   | 3.896E-01           | 2.854E-01 | 3.147E-01      | 5.325E-02 | 1.238   |
|         | +         | 163.33       |     | -3.758E-01          | 4.538E-01 | 7.112E-01      | 1.290E-01 | -0.528  |
| NP-237  | +         | 185.72       |     | 2.969E-01           | 8.121E-02 | 6.730E-02      | 6.429E-03 | 4.412   |
|         | +         | 205.31       |     | -4.919E-01          | 5.719E-01 | 7.823E-01      | 1.477E-01 | -0.629  |
|         | +         | 86.48        | *   | 1.575E+00           | 4.994E-01 | 3.440E-01      | 7.914E-02 | 4.578   |
| ANH-511 | +         | 95.86        |     | -8.374E-01          | 9.418E-01 | 1.345E+00      | 3.245E-01 | -0.623  |
|         | +         | 511.00       | *   | 1.809E-01           | 6.400E-02 | 4.598E-02      | 4.373E-03 | 3.934   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| BE-7    |           | 477.60       | *   | 1.439E-01           | 3.513E-01 | 5.957E-01           | 6.024E-02 | 0.242   |
| NA-22   |           | 1274.54      | *   | -2.111E-02          | 4.562E-02 | 7.057E-02           | 5.872E-03 | -0.299  |
| NA-24   |           | 1368.63      | *   | 3.438E+01           | 4.562E-02 | Half-Life too short |           |         |
| SC-46   |           | 889.28       | *   | -1.539E-02          | 4.282E-02 | 6.952E-02           | 6.572E-03 | -0.221  |
| V-48    | +         | 1120.55      |     | 4.034E-01           | 1.051E-01 | 1.561E-01           | 1.318E-02 | 2.585   |
|         |           | 944.13       |     | -3.906E-01          | 1.008E+00 | 1.618E+00           | 1.512E-01 | -0.241  |
|         |           | 983.53       | *   | 2.486E-02           | 9.174E-02 | 1.552E-01           | 1.429E-02 | 0.160   |
| CR-51   |           | 1312.11      |     | 5.098E-02           | 9.460E-02 | 1.618E-01           | 1.358E-02 | 0.315   |
|         |           | 320.08       | *   | -2.759E-02          | 4.347E-01 | 6.855E-01           | 8.010E-02 | -0.040  |
|         |           | 834.85       | *   | -1.504E-02          | 3.812E-02 | 6.216E-02           | 5.838E-03 | -0.242  |
| CO-56   |           | 846.77       | *   | 1.757E-02           | 3.695E-02 | 6.433E-02           | 6.053E-03 | 0.273   |
|         |           | 1037.84      |     | 5.675E-02           | 2.979E-01 | 5.003E-01           | 4.698E-02 | 0.113   |
|         | +         | 1238.28      |     | 2.217E-01           | 1.607E-01 | 1.975E-01           | 1.676E-02 | 1.123   |
|         |           | 1771.35      |     | -2.662E-04          | 1.918E-01 | 2.715E-01           | 2.244E-02 | -0.001  |
| CO-57   |           | 122.06       | *   | -4.620E-03          | 2.401E-02 | 3.993E-02           | 3.318E-03 | -0.116  |
| CO-58   |           | 136.47       |     | 5.892E-02           | 2.045E-01 | 3.441E-01           | 3.125E-02 | 0.171   |
|         |           | 810.76       | *   | -3.485E-03          | 3.940E-02 | 6.585E-02           | 6.169E-03 | -0.053  |
|         |           | 1099.45      | *   | -2.346E-02          | 9.870E-02 | 1.587E-01           | 1.475E-02 | -0.148  |
| FE-59   |           | 1291.59      |     | -9.402E-02          | 1.406E-01 | 2.119E-01           | 2.023E-02 | -0.444  |
| CO-60   |           | 1173.23      |     | -4.191E-03          | 5.037E-02 | 8.172E-02           | 6.571E-03 | -0.051  |
|         |           | 1332.49      | *   | 4.017E-02           | 3.738E-02 | 6.760E-02           | 5.702E-03 | 0.594   |

Sample ID : G247964001

Acquisition date : 10-MAR-2010 21:17:10

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key        | Activity (pCi/GRAM) | Act error           | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|------------|---------------------|---------------------|----------------|-----------|---------|
| ZN-65   | 1115.54   | *            | -6.126E-02 | 1.045E-01           | 1.372E-01           | 1.165E-02      | -0.447    |         |
| SE-75   | 121.12    |              | -1.377E-02 | 1.266E-01           | 2.113E-01           | 2.291E-02      | -0.065    |         |
|         | 136.00    |              | 2.295E-02  | 3.969E-02           | 6.740E-02           | 5.721E-03      | 0.341     |         |
|         | 264.66    | *            | -4.212E-02 | 4.667E-02           | 6.672E-02           | 7.787E-03      | -0.631    |         |
|         | 279.54    | +            | 2.265E-01  | 2.055E-01           | 1.880E-01           | 2.302E-02      | 1.205     |         |
|         | 400.66    |              | 5.428E-02  | 2.584E-01           | 4.381E-01           | 5.089E-02      | 0.124     |         |
| SR-85   | 514.00    | *            | 2.374E-02  | 4.298E-02           | 6.505E-02           | 6.185E-03      | 0.365     |         |
| Y-88    | 898.04    |              | 8.095E-03  | 4.753E-02           | 8.030E-02           | 7.626E-03      | 0.101     |         |
|         | 1836.06   | *            | 2.803E-02  | 3.521E-02           | 6.526E-02           | 5.298E-03      | 0.430     |         |
| Y-91    | 1204.77   | *            | 1.419E+01  | 2.438E+01           | 4.149E+01           | 3.374E+00      | 0.342     |         |
| NB-94   | 702.65    | *            | 3.122E-02  | 3.346E-02           | 5.747E-02           | 5.195E-03      | 0.543     |         |
|         | 871.09    |              | 2.610E-02  | 3.441E-02           | 6.077E-02           | 5.736E-03      | 0.429     |         |
| NB-95   | 765.81    | *            | 6.577E-02  | 5.620E-02           | 8.669E-02           | 8.013E-03      | 0.759     |         |
| NB-95M  | 235.69    | *            | -7.890E-02 | 1.554E-01           | 2.171E-01           | 2.585E-02      | -0.363    |         |
| ZR-95   | 724.19    |              | -3.538E-02 | 1.111E-01           | 1.500E-01           | 1.471E-02      | -0.236    |         |
|         | 756.73    | *            | 1.006E-01  | 8.263E-02           | 1.433E-01           | 1.443E-02      | 0.702     |         |
| MO-99   | 140.51    |              | -2.793E+00 | 7.011E+01           | 1.034E+02           | 2.452E+01      | -0.027    |         |
|         | 181.07    |              | 4.124E+01  | 5.565E+01           | 8.402E+01           | 1.611E+01      | 0.491     |         |
|         | 366.42    |              | 2.297E+00  | 2.749E+02           | 4.639E+02           | 4.692E+01      | 0.005     |         |
|         | 739.50    | *            | -3.994E+01 | 3.935E+01           | 5.692E+01           | 9.144E+00      | -0.702    |         |
|         | 777.92    |              | -8.708E+01 | 1.019E+02           | 1.488E+02           | 1.381E+01      | -0.585    |         |
| TC-99M  | 140.51    | *            | -2.180E+14 | 1.019E+02           | Half-Life too short |                |           |         |
| RU-103  | 497.08    | *            | -2.187E-03 | 4.037E-02           | 6.645E-02           | 9.660E-03      | -0.033    |         |
|         | 610.33    | +            | 2.123E+01  | 4.060E+00           | 3.679E+00           | 6.131E-01      | 5.770     |         |
| RH-106  | 621.93    | *            | -1.631E-01 | 3.146E-01           | 4.894E-01           | 6.658E-02      | -0.333    |         |
|         | 1050.41   |              | -3.327E-01 | 2.737E+00           | 4.466E+00           | 3.970E-01      | -0.075    |         |
| RU-106  | 621.93    | *            | -1.631E-01 | 3.141E-01           | 4.894E-01           | 4.476E-02      | -0.333    |         |
|         | 1050.41   |              | -3.327E-01 | 2.737E+00           | 4.466E+00           | 3.970E-01      | -0.075    |         |
| AG-108M | 433.94    | *            | -1.592E-02 | 2.860E-02           | 4.602E-02           | 4.453E-03      | -0.346    |         |
|         | 614.28    |              | -2.435E-02 | 4.157E-02           | 5.563E-02           | 5.259E-03      | -0.438    |         |
|         | 722.91    |              | -4.071E-02 | 4.468E-02           | 5.619E-02           | 5.267E-03      | -0.724    |         |
| AG-110M | 657.76    | *            | -9.761E-03 | 3.493E-02           | 5.526E-02           | 5.058E-03      | -0.177    |         |
|         | 677.62    |              | 4.136E-02  | 3.331E-01           | 5.427E-01           | 4.983E-02      | 0.076     |         |
|         | 706.68    |              | -2.485E-01 | 2.132E-01           | 3.072E-01           | 2.854E-02      | -0.809    |         |
|         | 763.94    |              | 2.170E-01  | 1.896E-01           | 2.951E-01           | 2.792E-02      | 0.735     |         |
|         | 884.68    |              | 8.072E-03  | 4.835E-02           | 8.191E-02           | 7.948E-03      | 0.099     |         |
|         | 937.49    |              | -7.945E-02 | 1.313E-01           | 1.757E-01           | 1.696E-02      | -0.452    |         |
|         | 1384.29   |              | 4.347E-02  | 1.952E-01           | 2.807E-01           | 2.451E-02      | 0.155     |         |
|         | 1505.03   |              | -4.493E-01 | 2.781E-01           | 3.571E-01           | 3.054E-02      | -1.258    |         |
| SN-113  | 391.69    | *            | -3.979E-02 | 4.497E-02           | 7.158E-02           | 6.794E-03      | -0.556    |         |
| CD-115  | 260.90    |              | -2.175E-05 | 4.497E-02           | Half-Life too short |                |           |         |
|         | 492.35    |              | -1.230E-04 | 4.497E-02           | Half-Life too short |                |           |         |
|         | 527.90    | *            | -3.212E-05 | 4.497E-02           | Half-Life too short |                |           |         |
| SN-117M | 156.02    |              | -8.216E-01 | 2.848E+00           | 4.660E+00           | 4.110E-01      | -0.176    |         |
|         | 158.56    | *            | -8.378E-02 | 7.108E-02           | 1.118E-01           | 9.931E-03      | -0.749    |         |
| TE-123M | 159.00    | *            | -2.067E-02 | 3.009E-02           | 4.840E-02           | 4.328E-03      | -0.427    |         |
| SB-124  | 602.73    |              | 1.867E-02  | 4.523E-02           | 6.702E-02           | 6.200E-03      | 0.279     |         |
|         | 645.85    |              | 2.202E-01  | 5.217E-01           | 8.716E-01           | 8.251E-02      | 0.253     |         |
|         | 722.78    |              | -1.660E-01 | 4.476E-01           | 6.026E-01           | 5.603E-02      | -0.276    |         |



Sample ID : G247964001

Acquisition date : 10-MAR-2010 21:17:10

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| SB-125  | 1690.97   | *            |     | 8.177E-03           | 8.380E-02 | 1.408E-01      | 1.236E-02 | 0.058   |
|         | 427.87    | *            |     | -1.553E-02          | 9.120E-02 | 1.508E-01      | 1.440E-02 | -0.103  |
|         | 463.37    |              | +   | 8.767E-01           | 4.318E-01 | 5.802E-01      | 5.851E-02 | 1.511   |
|         | 600.60    |              |     | 7.086E-02           | 1.840E-01 | 3.074E-01      | 3.029E-02 | 0.231   |
| TE-125M | 635.95    |              |     | 3.589E-02           | 2.657E-01 | 4.356E-01      | 4.237E-02 | 0.082   |
|         | 109.28    | *            |     | 6.747E+00           | 1.089E+01 | 1.690E+01      | 1.749E+00 | 0.399   |
|         | 388.63    |              |     | 1.675E-01           | 2.089E-01 | 3.645E-01      | 3.410E-02 | 0.459   |
|         | 666.33    | *            |     | 1.503E-01           | 2.903E-01 | 4.860E-01      | 4.323E-02 | 0.309   |
| SB-126  | 753.82    |              |     | -2.155E-01          | 2.560E+00 | 4.070E+00      | 3.748E-01 | -0.053  |
|         | 414.70    |              |     | 4.318E-02           | 9.103E-02 | 1.563E-01      | 1.461E-02 | 0.276   |
|         | 666.50    |              |     | 7.129E-02           | 1.006E-01 | 1.704E-01      | 1.516E-02 | 0.418   |
|         | 695.00    |              |     | -4.716E-02          | 9.698E-02 | 1.499E-01      | 1.351E-02 | -0.315  |
| SB-127  | 697.00    |              |     | 2.770E-03           | 3.297E-01 | 5.313E-01      | 4.791E-02 | 0.005   |
|         | 720.70    | *            |     | 1.089E-01           | 1.965E-01 | 3.073E-01      | 2.798E-02 | 0.355   |
|         | 856.80    |              |     | 1.313E-01           | 6.368E-01 | 9.505E-01      | 8.956E-02 | 0.138   |
|         | 252.40    |              |     | 7.907E+00           | 9.969E+00 | 1.571E+01      | 6.684E+00 | 0.503   |
| I-131   | 473.00    |              |     | 9.960E-01           | 3.377E+00 | 5.699E+00      | 8.285E-01 | 0.175   |
|         | 685.70    | *            |     | -1.758E+00          | 2.965E+00 | 4.488E+00      | 5.814E-01 | -0.392  |
|         | 783.70    |              |     | 9.477E+00           | 8.422E+00 | 1.440E+01      | 2.020E+00 | 0.658   |
|         | 80.19     |              |     | 9.127E+00           | 7.941E+00 | 1.042E+01      | 9.249E-01 | 0.876   |
| TE-132  | 284.31    |              |     | -1.036E+00          | 2.161E+00 | 3.352E+00      | 4.121E-01 | -0.309  |
|         | 364.49    | *            |     | 2.533E-02           | 1.622E-01 | 2.758E-01      | 2.924E-02 | 0.092   |
|         | 636.99    |              |     | 5.284E-01           | 2.220E+00 | 3.666E+00      | 3.503E-01 | 0.144   |
|         | 49.72     |              |     | 8.860E+00           | 4.498E+01 | 7.132E+01      | 8.507E+00 | 0.124   |
| BA-133  | 111.76    |              |     | -4.838E+01          | 8.060E+01 | 1.324E+02      | 1.607E+01 | -0.365  |
|         | 116.30    |              |     | 5.110E+01           | 7.095E+01 | 1.216E+02      | 1.470E+01 | 0.420   |
|         | 228.16    | *            |     | 1.867E+00           | 1.951E+00 | 3.239E+00      | 5.794E-01 | 0.576   |
|         | 81.00     |              |     | -5.693E-02          | 1.165E-01 | 1.385E-01      | 2.168E-02 | -0.411  |
| I-133   | 276.40    |              |     | 3.838E-01           | 3.663E-01 | 6.071E-01      | 9.928E-02 | 0.632   |
|         | 302.85    |              |     | 1.490E-01           | 1.544E-01 | 2.311E-01      | 3.525E-02 | 0.645   |
|         | 356.01    | *            |     | -2.198E-02          | 4.569E-02 | 6.561E-02      | 9.333E-03 | -0.335  |
|         | 383.85    |              |     | -2.115E-01          | 2.792E-01 | 4.474E-01      | 5.848E-02 | -0.473  |
| CS-134  | 529.87    | *            |     | 3.623E-02           | 2.792E-01 | Half-Life      | too short |         |
|         | 875.33    |              |     | 1.612E+00           | 2.792E-01 | Half-Life      | too short |         |
|         | 1298.22   |              |     | 5.693E+00           | 2.792E-01 | Half-Life      | too short |         |
|         | 563.25    |              | +   | 5.267E-01           | 5.178E-01 | 6.589E-01      | 6.250E-02 | 0.799   |
| CS-135  | 569.33    |              |     | -1.402E-01          | 2.070E-01 | 3.218E-01      | 3.057E-02 | -0.436  |
|         | 604.72    |              |     | -2.740E-02          | 3.886E-02 | 5.143E-02      | 4.762E-03 | -0.533  |
|         | 795.86    | *            | +   | 1.016E-01           | 6.566E-02 | 1.016E-01      | 9.522E-03 | 1.000   |
|         | 801.95    |              |     | -4.466E-01          | 4.186E-01 | 6.456E-01      | 6.054E-02 | -0.692  |
| I-135   | 1365.19   |              |     | 3.770E-01           | 1.239E+00 | 2.071E+00      | 1.839E-01 | 0.182   |
|         | 268.22    | *            |     | 2.559E-01           | 1.718E-01 | 2.649E-01      | 3.378E-02 | 0.966   |
|         | 546.56    |              |     | -2.844E+14          | 1.718E-01 | Half-Life      | too short |         |
|         | 836.80    |              |     | 9.942E+14           | 1.718E-01 | Half-Life      | too short |         |
| I-135   | 1038.76   |              |     | 9.747E+12           | 1.718E-01 | Half-Life      | too short |         |
|         | 1131.51   |              |     | -3.228E+14          | 1.718E-01 | Half-Life      | too short |         |
|         | 1260.41   | *            |     | 2.087E+14           | 1.718E-01 | Half-Life      | too short |         |
|         | 1457.56   |              |     | 2.296E+16           | 1.718E-01 | Half-Life      | too short |         |
| I-135   | 1678.03   |              |     | 5.007E+14           | 1.718E-01 | Half-Life      | too short |         |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| CS-136  | 1791.20   |              |     | -2.122E+13          | 1.718E-01 | Half-Life      | too short |         |
|         | 153.25    |              |     | 3.393E-01           | 1.093E+00 | 1.828E+00      | 1.898E-01 | 0.186   |
|         | 176.60    |              |     | -8.057E-02          | 6.145E-01 | 1.004E+00      | 1.020E-01 | -0.080  |
|         | 273.65    |              |     | -7.633E-02          | 8.543E-01 | 9.440E-01      | 1.172E-01 | -0.081  |
|         | 340.55    |              |     | 3.237E-01           | 2.029E-01 | 3.283E-01      | 3.652E-02 | 0.986   |
|         | 818.51    |              |     | 5.021E-02           | 9.192E-02 | 1.606E-01      | 1.506E-02 | 0.313   |
|         | 1048.07   | *            |     | 1.003E-02           | 1.393E-01 | 2.301E-01      | 2.130E-02 | 0.044   |
| BA-137M | 1235.36   |              |     | 5.097E-01           | 8.593E-01 | 1.281E+00      | 1.471E-01 | 0.398   |
|         | 661.66    | *            |     | -2.886E-02          | 3.551E-02 | 5.357E-02      | 4.754E-03 | -0.539  |
| CS-137  | 661.66    | *            |     | -3.049E-02          | 3.751E-02 | 5.659E-02      | 5.031E-03 | -0.539  |
| CE-139  | 165.86    | *            |     | -1.668E-02          | 2.967E-02 | 4.778E-02      | 4.333E-03 | -0.349  |
| BA-140  | 162.66    |              |     | -1.704E-01          | 1.052E+00 | 1.712E+00      | 1.633E-01 | -0.100  |
|         | 304.85    |              |     | -3.167E-01          | 1.830E+00 | 2.543E+00      | 7.705E-01 | -0.125  |
| LA-140  | 423.72    |              |     | 5.422E-03           | 2.361E+00 | 3.945E+00      | 1.306E+00 | 0.001   |
|         | 537.26    | *            |     | -1.099E-02          | 3.451E-01 | 5.657E-01      | 1.932E-01 | -0.019  |
|         | 328.76    |              |     | 9.058E-01           | 5.262E-01 | 7.130E-01      | 8.222E-02 | 1.270   |
|         | 487.02    |              |     | 3.991E-03           | 1.682E-01 | 2.788E-01      | 2.788E-02 | 0.014   |
|         | 815.77    |              |     | -2.532E-01          | 4.126E-01 | 6.599E-01      | 6.796E-02 | -0.384  |
|         | 1596.21   | *            |     | 3.295E-02           | 1.099E-01 | 1.674E-01      | 1.426E-02 | 0.197   |
|         | 57.36     |              |     | -1.360E-04          | 1.099E-01 | Half-Life      | too short |         |
| CE-143  | 293.27    | *            |     | 4.825E-03           | 1.099E-01 | Half-Life      | too short |         |
|         | 664.57    |              |     | -1.288E-03          | 1.099E-01 | Half-Life      | too short |         |
|         | 721.93    |              |     | 2.245E-03           | 1.099E-01 | Half-Life      | too short |         |
| CE-144  | 80.12     |              |     | 3.512E+00           | 3.003E+00 | 3.945E+00      | 3.464E-01 | 0.890   |
|         | 133.52    | *            |     | -3.803E-02          | 2.226E-01 | 3.302E-01      | 5.005E-02 | -0.115  |
| PM-144  | 476.78    |              |     | 1.137E-02           | 6.777E-02 | 1.134E-01      | 1.155E-02 | 0.100   |
|         | 618.01    |              |     | 1.803E-02           | 3.322E-02 | 5.602E-02      | 5.263E-03 | 0.322   |
| PR-144  | 696.49    | *            |     | -1.703E-02          | 3.349E-02 | 5.162E-02      | 4.657E-03 | -0.330  |
|         | 696.51    | *            |     | -1.270E+00          | 2.513E+00 | 3.874E+00      | 3.493E-01 | -0.328  |
| PM-146  | 1489.16   |              |     | -1.856E-01          | 1.178E+01 | 1.968E+01      | 1.683E+00 | -0.009  |
|         | 453.88    | *            |     | 4.505E-03           | 4.322E-02 | 7.171E-02      | 8.100E-03 | 0.063   |
|         | 633.25    |              |     | 3.858E-02           | 1.385E+00 | 2.253E+00      | 8.629E-01 | 0.017   |
| ND-147  | 735.93    |              |     | 1.771E-01           | 1.600E-01 | 2.658E-01      | 7.495E-02 | 0.666   |
|         | 747.24    |              |     | -5.848E-02          | 1.050E-01 | 1.600E-01      | 2.388E-02 | -0.366  |
|         | 91.11     |              |     | 1.622E+00           | 4.319E-01 | 6.366E-01      | 6.367E-02 | 2.549   |
|         | 319.41    |              |     | 1.484E+00           | 4.531E+00 | 7.302E+00      | 8.292E-01 | 0.203   |
| PM-149  | 531.02    | *            |     | 8.251E-01           | 7.507E-01 | 1.304E+00      | 2.018E-01 | 0.632   |
| EU-152  | 285.90    | *            |     | -3.014E-04          | 7.507E-01 | Half-Life      | too short |         |
|         | 121.78    |              |     | -1.821E-02          | 6.876E-02 | 1.140E-01      | 1.098E-02 | -0.160  |
|         | 244.70    |              |     | -7.167E-02          | 3.417E-01 | 4.834E-01      | 5.375E-02 | -0.148  |
|         | 344.28    | *            |     | -5.380E-02          | 9.412E-02 | 1.490E-01      | 1.664E-02 | -0.361  |
|         | 778.90    |              |     | -4.171E-01          | 2.648E-01 | 3.554E-01      | 3.297E-02 | -1.174  |
| GD-153  | 964.08    |              |     | 7.681E-01           | 3.623E-01 | 5.954E-01      | 5.523E-02 | 1.290   |
|         | 1085.87   |              |     | -1.208E-01          | 3.955E-01 | 6.324E-01      | 5.489E-02 | -0.191  |
|         | 1112.07   |              |     | 6.035E-02           | 3.170E-01 | 5.283E-01      | 4.495E-02 | 0.114   |
|         | 1408.01   |              |     | 2.787E-01           | 2.015E-01 | 3.695E-01      | 3.146E-02 | 0.754   |
|         | 69.67     |              |     | 1.213E+00           | 1.821E+00 | 2.886E+00      | 2.274E-01 | 0.420   |
|         | 97.43     | *            |     | -4.549E-02          | 8.965E-02 | 1.330E-01      | 1.182E-02 | -0.342  |
|         | 103.18    |              |     | -6.816E-02          | 1.117E-01 | 1.644E-01      | 1.417E-02 | -0.415  |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| EU-154  |           | 123.07       |     | 1.121E-02           | 4.868E-02 | 8.216E-02      | 9.132E-03 | 0.136   |
|         |           | 723.31       |     | -1.583E-01          | 2.007E-01 | 2.552E-01      | 2.538E-02 | -0.620  |
|         |           | 873.19       |     | -2.312E-01          | 2.902E-01 | 4.524E-01      | 5.656E-02 | -0.511  |
|         |           | 996.26       |     | -3.549E-01          | 3.909E-01 | 5.909E-01      | 1.048E-01 | -0.601  |
|         |           | 1004.73      |     | -2.047E-01          | 2.237E-01 | 3.394E-01      | 4.075E-02 | -0.603  |
|         |           | 1274.44      | *   | -5.077E-02          | 1.287E-01 | 2.004E-01      | 2.234E-02 | -0.253  |
| TB-160  | +         | 86.79        |     | 1.769E+00           | 4.208E-01 | 5.375E-01      | 5.105E-02 | 3.291   |
|         |           | 197.04       |     | -3.364E-01          | 6.053E-01 | 9.508E-01      | 9.363E-02 | -0.354  |
|         |           | 215.65       |     | -1.362E-01          | 7.901E-01 | 1.274E+00      | 1.317E-01 | -0.107  |
|         |           | 298.57       |     | 2.649E-01           | 1.645E-01 | 2.101E-01      | 2.466E-02 | 1.261   |
|         |           | 879.36       | *   | 2.202E-02           | 1.367E-01 | 2.317E-01      | 2.189E-02 | 0.095   |
|         |           | 962.29       |     | 2.321E-02           | 6.876E-01 | 1.008E+00      | 9.360E-02 | 0.023   |
| HO-166M | +         | 966.15       |     | 5.586E-01           | 2.635E-01 | 5.179E-01      | 4.801E-02 | 1.079   |
|         |           | 1177.93      |     | 2.333E-01           | 4.204E-01 | 7.147E-01      | 5.756E-02 | 0.326   |
|         |           | 1271.85      |     | -2.275E-01          | 8.096E-01 | 1.279E+00      | 1.062E-01 | -0.178  |
|         |           | 80.57        |     | 5.646E-03           | 3.359E-01 | 4.138E-01      | 3.651E-02 | 0.014   |
|         | +         | 184.41       |     | 2.359E-01           | 6.452E-02 | 6.857E-02      | 6.528E-03 | 3.440   |
|         |           | 280.46       |     | -5.946E-03          | 9.775E-02 | 1.383E-01      | 1.659E-02 | -0.043  |
| TA-182  |           | 410.95       |     | 2.962E-01           | 2.712E-01 | 4.302E-01      | 4.016E-02 | 0.688   |
|         |           | 711.68       | *   | 1.845E-02           | 5.903E-02 | 9.731E-02      | 8.829E-03 | 0.190   |
|         |           | 752.31       |     | -1.689E-01          | 3.132E-01 | 4.801E-01      | 4.419E-02 | -0.352  |
|         |           | 810.29       |     | -3.084E-02          | 5.828E-02 | 9.400E-02      | 8.787E-03 | -0.328  |
|         |           | 67.75        |     | -1.710E-02          | 1.188E-01 | 1.825E-01      | 1.412E-02 | -0.094  |
|         |           | 100.11       |     | 2.682E-02           | 1.711E-01 | 2.908E-01      | 2.543E-02 | 0.092   |
| IR-192  |           | 152.43       |     | -9.313E-02          | 3.614E-01 | 5.930E-01      | 5.182E-02 | -0.157  |
|         |           | 222.11       |     | 1.140E-01           | 3.580E-01 | 5.881E-01      | 6.185E-02 | 0.194   |
|         | +         | 1121.30      |     | 1.107E+00           | 2.885E-01 | 4.248E-01      | 3.587E-02 | 2.606   |
|         |           | 1189.05      |     | 1.595E-01           | 3.412E-01 | 5.768E-01      | 4.664E-02 | 0.277   |
|         |           | 1221.41      | *   | -5.231E-02          | 2.140E-01 | 3.413E-01      | 2.791E-02 | -0.153  |
|         |           | 1231.02      |     | -6.217E-01          | 6.367E-01 | 7.934E-01      | 6.508E-02 | -0.784  |
| BI-207  | +         | 295.96       |     | 1.781E+00           | 3.019E-01 | 3.489E-01      | 4.127E-02 | 5.106   |
|         |           | 308.46       |     | 5.867E-02           | 1.022E-01 | 1.671E-01      | 1.939E-02 | 0.351   |
|         |           | 316.51       | *   | -3.060E-02          | 3.818E-02 | 5.740E-02      | 6.560E-03 | -0.533  |
|         |           | 468.07       |     | 1.567E-02           | 7.196E-02 | 1.070E-01      | 1.078E-02 | 0.146   |
|         |           | 72.81        |     | 1.428E-01           | 1.867E-01 | 2.959E-01      | 2.404E-02 | 0.483   |
|         | +         | 74.97        |     | 1.075E+00           | 1.696E-01 | 2.470E-01      | 2.051E-02 | 4.353   |
| PB-210  |           | 569.70       |     | -2.879E-02          | 3.190E-02 | 4.866E-02      | 4.568E-03 | -0.592  |
|         |           | 1063.66      | *   | -2.379E-02          | 5.428E-02 | 8.592E-02      | 7.574E-03 | -0.277  |
|         |           | 1770.23      |     | -2.949E-02          | 3.920E-01 | 5.415E-01      | 4.475E-02 | -0.054  |
|         |           | 46.54        | *   | 1.176E+00           | 3.510E+00 | 5.571E+00      | 5.151E-01 | 0.211   |
|         |           | 404.85       | *   | -2.852E-02          | 7.885E-01 | 1.161E+00      | 5.632E-01 | -0.025  |
|         |           | 427.09       |     | 1.455E-01           | 1.506E+00 | 2.527E+00      | 1.173E+00 | 0.058   |
| RN-219  |           | 832.01       |     | -9.415E-01          | 1.075E+00 | 1.482E+00      | 7.707E-01 | -0.635  |
|         | +         | 271.23       |     | 1.000E+00           | 3.875E-01 | 4.629E-01      | 6.040E-02 | 2.160   |
|         |           | 401.81       | *   | 1.262E-01           | 4.040E-01 | 6.878E-01      | 1.051E-01 | 0.183   |
|         |           | 81.07        |     | -1.311E-01          | 2.631E-01 | 3.131E-01      | 2.779E-02 | -0.419  |
|         |           | 83.79        |     | 3.594E-01           | 1.229E-01 | 2.163E-01      | 1.981E-02 | 1.662   |
|         |           | 94.87        |     | 6.860E-01           | 4.469E-01 | 7.188E-01      | 6.500E-02 | 0.954   |
| RA-223  | +         | 144.24       |     | 1.306E+00           | 9.390E-01 | 1.173E+00      | 1.124E-01 | 1.113   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|---------------------|-----------|----------------|-----------|---------|
| AC-227  |           | 154.21       | 2.658E-01           | 3.944E-01 | 6.668E-01      | 6.394E-02 | 0.399   |
|         | +         | 269.46       | 7.770E-01           | 2.982E-01 | 3.608E-01      | 4.290E-02 | 2.153   |
|         |           | 323.87 *     | 2.916E-01           | 7.199E-01 | 1.040E+00      | 1.954E-01 | 0.280   |
|         | +         | 338.28       | 9.356E+00           | 2.153E+00 | 2.658E+00      | 3.669E-01 | 3.520   |
|         |           | 79.69        | 4.636E-01           | 1.556E+00 | 1.948E+00      | 3.369E-01 | 0.238   |
|         |           | 235.96       | -3.204E-03          | 1.753E-01 | 2.522E-01      | 3.100E-02 | -0.013  |
| TH-227  |           | 256.23 *     | -1.069E-01          | 2.596E-01 | 4.078E-01      | 5.787E-02 | -0.262  |
|         | +         | 299.98       | 4.354E+00           | 1.673E+00 | 1.801E+00      | 2.698E-01 | 2.418   |
|         |           | 304.50       | 3.462E-02           | 1.761E+00 | 2.489E+00      | 4.552E-01 | 0.014   |
|         |           | 334.37       | -5.996E-01          | 1.810E+00 | 2.648E+00      | 4.509E-01 | -0.226  |
|         |           | 79.80        | 6.750E-01           | 2.054E+00 | 2.573E+00      | 5.617E-01 | 0.262   |
|         |           | 235.96       | -3.204E-03          | 1.753E-01 | 2.522E-01      | 2.977E-02 | -0.013  |
| TH-229  |           | 256.23 *     | -1.069E-01          | 2.597E-01 | 4.078E-01      | 6.334E-02 | -0.262  |
|         | +         | 299.98       | 4.354E+00           | 1.673E+00 | 1.801E+00      | 2.698E-01 | 2.418   |
|         |           | 304.50       | 3.462E-02           | 1.761E+00 | 2.489E+00      | 4.552E-01 | 0.014   |
|         |           | 334.37       | -5.996E-01          | 1.810E+00 | 2.648E+00      | 4.509E-01 | -0.226  |
|         |           | 85.43        | 5.723E-01           | 1.990E-01 | 3.521E-01      | 3.289E-02 | 1.625   |
|         | +         | 88.47        | 8.138E-01           | 1.935E-01 | 2.307E-01      | 2.212E-02 | 3.527   |
| PA-231  |           | 193.51 *     | 1.335E-01           | 5.132E-01 | 8.476E-01      | 8.268E-02 | 0.158   |
|         |           | 210.85       | 1.896E+00           | 1.042E+00 | 1.625E+00      | 1.660E-01 | 1.167   |
|         |           | 283.69 *     | -6.340E-01          | 1.530E+00 | 2.257E+00      | 3.785E-01 | -0.281  |
| TH-231  | +         | 301.36       | 2.797E+00           | 1.070E+00 | 1.156E+00      | 1.676E-01 | 2.419   |
|         |           | 81.07        | -1.311E-01          | 2.631E-01 | 3.131E-01      | 2.779E-02 | -0.419  |
|         |           | 83.79        | 3.594E-01           | 1.229E-01 | 2.163E-01      | 1.981E-02 | 1.662   |
|         |           | 94.87        | 6.860E-01           | 4.469E-01 | 7.188E-01      | 6.500E-02 | 0.954   |
|         | +         | 144.24       | 1.306E+00           | 9.390E-01 | 1.173E+00      | 1.124E-01 | 1.113   |
|         |           | 154.21       | 2.658E-01           | 3.944E-01 | 6.668E-01      | 6.394E-02 | 0.399   |
|         | +         | 269.46       | 7.770E-01           | 2.982E-01 | 3.608E-01      | 4.290E-02 | 2.153   |
| PA-233  |           | 323.87 *     | 2.916E-01           | 7.199E-01 | 1.040E+00      | 1.954E-01 | 0.280   |
|         | +         | 338.28       | 9.356E+00           | 2.153E+00 | 2.658E+00      | 3.669E-01 | 3.520   |
|         | +         | 300.13       | 1.970E+00           | 7.717E-01 | 8.183E-01      | 1.376E-01 | 2.407   |
| PA-234  |           | 311.90 *     | -2.271E-02          | 6.731E-02 | 1.046E-01      | 1.223E-02 | -0.217  |
|         |           | 340.48       | 1.238E+00           | 7.529E-01 | 1.138E+00      | 2.841E-01 | 1.087   |
|         |           | 94.67        | 4.430E-01           | 1.724E-01 | 2.758E-01      | 3.505E-02 | 1.606   |
|         |           | 98.44        | 7.253E-02           | 9.520E-02 | 1.490E-01      | 8.319E-02 | 0.487   |
|         |           | 111.00       | -1.554E-04          | 1.764E-01 | 2.968E-01      | 3.543E-02 | -0.001  |
|         |           | 131.20       | 7.612E-05           | 1.151E-01 | 1.723E-01      | 1.441E-02 | 0.000   |
| PA-234M |           | 569.50       | -2.144E-01          | 2.830E-01 | 4.369E-01      | 4.102E-02 | -0.491  |
|         |           | 733.00       | -2.867E-01          | 4.209E-01 | 6.043E-01      | 1.354E-01 | -0.475  |
|         |           | 880.51       | -3.722E-01          | 2.828E-01 | 4.174E-01      | 3.943E-02 | -0.892  |
|         |           | 883.24       | 4.593E-02           | 2.728E-01 | 4.596E-01      | 3.094E-01 | 0.100   |
|         |           | 926.50       | -2.882E-02          | 1.761E-01 | 2.810E-01      | 7.181E-02 | -0.103  |
|         |           | 946.00 *     | -6.421E-02          | 2.938E-01 | 4.790E-01      | 9.150E-02 | -0.134  |
|         |           | 949.00       | -1.252E-01          | 4.339E-01 | 7.032E-01      | 6.558E-02 | -0.178  |
|         |           | 766.42       | 2.248E+01           | 1.870E+01 | 2.347E+01      | 1.193E+01 | 0.958   |
|         |           | 1001.03 *    | 7.332E+00           | 5.058E+00 | 9.128E+00      | 9.504E-01 | 0.803   |
|         |           | 63.29 *      | 1.400E+00           | 1.442E+00 | 2.300E+00      | 4.101E-01 | 0.609   |
| TH-234  | +         | 92.59        | 4.854E+00           | 1.461E+00 | 1.408E+00      | 3.142E-01 | 3.448   |
| U-238   |           | 63.29 *      | 1.400E+00           | 1.442E+00 | 2.300E+00      | 4.101E-01 | 0.609   |

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| NP-239  | +         | 92.59        |     | 4.854E+00           | 1.077E+00 | 1.408E+00      | 1.297E-01 | 3.448   |
|         |           | 99.53        |     | 1.475E-01           | 1.556E-01 | 2.690E-01      | 2.360E-02 | 0.548   |
|         |           | 103.37       |     | -5.078E-02          | 1.007E-01 | 1.490E-01      | 1.283E-02 | -0.341  |
|         | +         | 106.12       |     | 1.587E-01           | 1.161E-01 | 1.428E-01      | 1.217E-02 | 1.112   |
|         |           | 117.23       | *   | 1.496E-01           | 3.891E-01 | 6.612E-01      | 5.504E-02 | 0.226   |
| AM-241  |           | 228.18       |     | 2.182E-01           | 2.270E-01 | 3.804E-01      | 4.062E-02 | 0.574   |
|         | +         | 277.60       |     | 3.504E-01           | 3.177E-01 | 3.137E-01      | 3.755E-02 | 1.117   |
|         |           | 59.54        | *   | 4.472E-02           | 1.583E-01 | 2.497E-01      | 1.960E-02 | 0.179   |
| CM-247  | +         | 278.00       |     | 1.488E+00           | 1.349E+00 | 1.351E+00      | 1.619E-01 | 1.101   |
|         |           | 287.50       |     | 9.575E-01           | 1.254E+00 | 2.073E+00      | 2.468E-01 | 0.462   |
| CF-249  |           | 402.40       | *   | 1.021E-02           | 3.720E-02 | 6.324E-02      | 5.880E-03 | 0.161   |
|         |           | 252.80       |     | 1.339E-02           | 9.848E-01 | 1.585E+00      | 1.796E-01 | 0.008   |
|         |           | 333.37       |     | 1.107E-01           | 2.184E-01 | 2.909E-01      | 3.211E-02 | 0.380   |
| CF-251  |           | 388.16       | *   | 4.469E-02           | 3.965E-02 | 7.012E-02      | 6.572E-03 | 0.637   |
|         |           | 177.52       | *   | -1.192E-02          | 1.261E-01 | 2.064E-01      | 1.929E-02 | -0.058  |
|         |           | 227.38       |     | 4.701E-02           | 3.696E-01 | 6.015E-01      | 6.411E-02 | 0.078   |
|         |           | 285.41       |     | -2.487E+00          | 2.252E+00 | 3.343E+00      | 3.990E-01 | -0.744  |

# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*                                     DETECTOR DATA                          *
*                                     *                                       *
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964001      *
* Acquisition date   : 10-MAR-2010 21:17:10 Detector SN#                   *
* Detector ID        : GAM16 Sensitivity : 5.000                          *
* Geometry           : CAN Energy tolerance: 1.500                        *
* Elapsed live time  : 0 02:00:00.00 Abundance limit : 75.000             *
* Elapsed real time  : 0 02:00:02.63 Half life ratio : 8.000              *
*****
*                                     SAMPLE DATA                            *
*                                     *                                       *
* Sample date       : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID         : G247964001 Analyst initials: MXR1                  *
* Batch Number      : 958216 Sample Quantity : 1.3653E+02 GRAM           *
* Recovery          : 1.00000 Carrier Weight : 0.00000                   *
*****
*                                     QC DATA                                *
*                                     *                                       *
* Standard Weight   : 0.00000                                              *
* CALIB. DATE/TIME  : 16-NOV-2009 11:22:16 MS Isotope :                   *
* MSD DPM           : 0.000 MSD Isotope :                               *
* LCS DPM           : 0.000 LCS Isotope :                               *
* LCSD DPM          : 0.000 LCSD Isotope :                               *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act error | MDA<br>(pCi/GRAM ) |           |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.763E+01               | 3.747E+00 | 5.737E-01          | 0.000E+00 |
| CD-109  | 5.435E+00               | 1.267E+00 | 1.235E+00          | 0.000E+00 |
| SN-126  | 5.279E-01               | 1.230E-01 | 1.205E-01          | 0.000E+00 |
| CE-141  | 1.338E-01               | 9.415E-02 | 1.105E-01          | 0.000E+00 |
| EU-155  | 1.994E-01               | 1.430E-01 | 1.749E-01          | 0.000E+00 |
| HG-203  | 8.283E-02               | 7.361E-02 | 6.685E-02          | 0.000E+00 |
| TL-208  | 8.439E-01               | 1.215E-01 | 6.005E-02          | 0.000E+00 |
| BI-211  | 6.262E+00               | 8.164E-01 | 3.333E-01          | 0.000E+00 |
| BI-212  | 2.764E+00               | 8.306E-01 | 7.714E-01          | 0.000E+00 |
| PB-212  | 2.576E+00               | 3.250E-01 | 9.628E-02          | 0.000E+00 |
| BI-214  | 1.908E+00               | 2.648E-01 | 1.101E-01          | 0.000E+00 |
| PB-214  | 2.273E+00               | 3.208E-01 | 1.218E-01          | 0.000E+00 |
| RA-224  | 8.170E+00               | 1.604E+00 | 1.032E+00          | 0.000E+00 |
| RA-226  | 1.908E+00               | 2.648E-01 | 1.101E-01          | 0.000E+00 |
| AC-228  | 2.467E+00               | 4.493E-01 | 2.298E-01          | 0.000E+00 |
| RA-228  | 2.467E+00               | 4.493E-01 | 2.298E-01          | 0.000E+00 |
| TH-228  | 2.576E+00               | 3.250E-01 | 9.628E-02          | 0.000E+00 |
| TH-232  | 2.467E+00               | 4.493E-01 | 2.298E-01          | 0.000E+00 |
| U-235   | 3.896E-01               | 2.797E-01 | 3.296E-01          | 0.000E+00 |
| NP-237  | 1.575E+00               | 4.894E-01 | 3.637E-01          | 0.000E+00 |
| ANH-511 | 1.809E-01               | 6.272E-02 | 4.705E-02          | 0.000E+00 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | 1.439E-01                           | 3.442E-01                | 6.103E-01          | 0.000E+00 NOT IDENT. |
| NA-22   | -2.111E-02                          | 4.470E-02                | 7.095E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 7.952E+07                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| SC-46   | -1.539E-02                          | 4.196E-02                | 7.039E-02          | 0.000E+00 FAIL ABUN  |
| V-48    | 2.486E-02                           | 8.991E-02                | 1.569E-01          | 0.000E+00 NOT IDENT. |
| CR-51   | -2.759E-02                          | 4.260E-01                | 7.076E-01          | 0.000E+00 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| MN-54   | -1.504E-02 | 3.736E-02 | 6.301E-02 | 0.000E+00 | NOT IDENT. |
| CO-56   | 1.757E-02  | 3.621E-02 | 6.519E-02 | 0.000E+00 | FAIL ABUN  |
| CO-57   | -4.620E-03 | 2.353E-02 | 4.195E-02 | 0.000E+00 | NOT IDENT. |
| CO-58   | -3.485E-03 | 3.862E-02 | 6.679E-02 | 0.000E+00 | NOT IDENT. |
| FE-59   | -2.346E-02 | 9.673E-02 | 1.600E-01 | 0.000E+00 | NOT IDENT. |
| CO-60   | 4.017E-02  | 3.663E-02 | 6.791E-02 | 0.000E+00 | NOT IDENT. |
| ZN-65   | -6.126E-02 | 1.024E-01 | 1.383E-01 | 0.000E+00 | NOT IDENT. |
| SE-75   | -4.212E-02 | 4.573E-02 | 6.912E-02 | 0.000E+00 | FAIL ABUN  |
| SR-85   | 2.374E-02  | 4.212E-02 | 6.655E-02 | 0.000E+00 | NOT IDENT. |
| Y-88    | 2.803E-02  | 3.450E-02 | 6.514E-02 | 0.000E+00 | NOT IDENT. |
| Y-91    | 1.419E+01  | 2.390E+01 | 4.176E+01 | 0.000E+00 | NOT IDENT. |
| NB-94   | 3.122E-02  | 3.279E-02 | 5.845E-02 | 0.000E+00 | NOT IDENT. |
| NB-95   | 6.577E-02  | 5.508E-02 | 8.802E-02 | 0.000E+00 | NOT IDENT. |
| NB-95M  | -7.890E-02 | 1.523E-01 | 2.254E-01 | 0.000E+00 | NOT IDENT. |
| ZR-95   | 1.006E-01  | 8.098E-02 | 1.456E-01 | 0.000E+00 | NOT IDENT. |
| MO-99   | -3.994E+01 | 3.856E+01 | 5.784E+01 | 0.000E+00 | NOT IDENT. |
| TC-99M  | 0.000E+00  | 5.364E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | -2.187E-03 | 3.956E-02 | 6.803E-02 | 0.000E+00 | FAIL ABUN  |
| RH-106  | -1.631E-01 | 3.083E-01 | 4.990E-01 | 0.000E+00 | NOT IDENT. |
| RU-106  | -1.631E-01 | 3.079E-01 | 4.990E-01 | 0.000E+00 | NOT IDENT. |
| AG-108M | -1.592E-02 | 2.803E-02 | 4.724E-02 | 0.000E+00 | NOT IDENT. |
| AG-110M | -9.761E-03 | 3.423E-02 | 5.627E-02 | 0.000E+00 | NOT IDENT. |
| SN-113  | -3.979E-02 | 4.407E-02 | 7.361E-02 | 0.000E+00 | NOT IDENT. |
| CD-115  | 0.000E+00  | 4.270E+01 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| SN-117M | -8.378E-02 | 6.966E-02 | 1.169E-01 | 0.000E+00 | NOT IDENT. |
| TE-123M | -2.067E-02 | 2.949E-02 | 5.061E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | 8.177E-03  | 8.212E-02 | 1.408E-01 | 0.000E+00 | NOT IDENT. |
| SB-125  | -1.553E-02 | 8.938E-02 | 1.548E-01 | 0.000E+00 | FAIL ABUN  |
| TE-125M | 6.747E+00  | 1.067E+01 | 1.780E+01 | 0.000E+00 | NOT IDENT. |
| I-126   | 1.503E-01  | 2.844E-01 | 4.948E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | 1.089E-01  | 1.926E-01 | 3.124E-01 | 0.000E+00 | NOT IDENT. |
| SB-127  | -1.758E+00 | 2.905E+00 | 4.567E+00 | 0.000E+00 | NOT IDENT. |
| I-131   | 2.533E-02  | 1.589E-01 | 2.841E-01 | 0.000E+00 | NOT IDENT. |
| TE-132  | 1.867E+00  | 1.912E+00 | 3.365E+00 | 0.000E+00 | NOT IDENT. |
| BA-133  | -2.198E-02 | 4.477E-02 | 6.760E-02 | 0.000E+00 | NOT IDENT. |
| I-133   | 0.000E+00  | 1.794E+05 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | 1.016E-01  | 6.435E-02 | 1.030E-01 | 0.000E+00 | FAIL ABUN  |
| CS-135  | 2.559E-01  | 1.684E-01 | 2.744E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 3.156E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | 1.003E-02  | 1.365E-01 | 2.322E-01 | 0.000E+00 | NOT IDENT. |
| BA-137M | -2.886E-02 | 3.480E-02 | 5.455E-02 | 0.000E+00 | NOT IDENT. |
| CS-137  | -3.049E-02 | 3.676E-02 | 5.763E-02 | 0.000E+00 | NOT IDENT. |
| CE-139  | -1.668E-02 | 2.908E-02 | 4.992E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | -1.099E-02 | 3.382E-01 | 5.784E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | 3.295E-02  | 1.077E-01 | 1.676E-01 | 0.000E+00 | FAIL ABUN  |
| CE-143  | 0.000E+00  | 1.825E+03 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CE-144  | -3.803E-02 | 2.181E-01 | 3.463E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | -1.703E-02 | 3.282E-02 | 5.251E-02 | 0.000E+00 | NOT IDENT. |
| PR-144  | -1.270E+00 | 2.462E+00 | 3.941E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | 4.505E-03  | 4.235E-02 | 7.354E-02 | 0.000E+00 | NOT IDENT. |
| ND-147  | 8.251E-01  | 7.357E-01 | 1.334E+00 | 0.000E+00 | FAIL ABUN  |
| PM-149  | 0.000E+00  | 3.550E+02 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| EU-152  | -5.380E-02 | 9.224E-02 | 1.536E-01 | 0.000E+00 | FAIL ABUN  |
| GD-153  | -4.549E-02 | 8.785E-02 | 1.403E-01 | 0.000E+00 | NOT IDENT. |
| EU-154  | -5.077E-02 | 1.261E-01 | 2.015E-01 | 0.000E+00 | NOT IDENT. |
| TB-160  | 2.202E-02  | 1.340E-01 | 2.346E-01 | 0.000E+00 | FAIL ABUN  |
| HO-166M | 1.845E-02  | 5.785E-02 | 9.895E-02 | 0.000E+00 | FAIL ABUN  |
| TA-182  | -5.231E-02 | 2.097E-01 | 3.435E-01 | 0.000E+00 | FAIL ABUN  |
| IR-192  | -3.060E-02 | 3.742E-02 | 5.927E-02 | 0.000E+00 | FAIL ABUN  |
| BI-207  | -2.379E-02 | 5.320E-02 | 8.669E-02 | 0.000E+00 | FAIL ABUN  |
| PB-210  | 1.176E+00  | 3.440E+00 | 5.954E+00 | 0.000E+00 | NOT IDENT. |
| PB-211  | -2.852E-02 | 7.728E-01 | 1.193E+00 | 0.000E+00 | NOT IDENT. |
| RN-219  | 1.262E-01  | 3.959E-01 | 7.070E-01 | 0.000E+00 | FAIL ABUN  |
| RA-223  | 2.916E-01  | 7.055E-01 | 1.073E+00 | 0.000E+00 | FAIL ABUN  |
| AC-227  | -1.069E-01 | 2.544E-01 | 4.227E-01 | 0.000E+00 | FAIL ABUN  |
| TH-227  | -1.069E-01 | 2.545E-01 | 4.227E-01 | 0.000E+00 | FAIL ABUN  |
| TH-229  | 1.335E-01  | 5.030E-01 | 8.831E-01 | 0.000E+00 | FAIL ABUN  |
| PA-231  | -6.340E-01 | 1.500E+00 | 2.335E+00 | 0.000E+00 | FAIL ABUN  |
| TH-231  | 2.916E-01  | 7.055E-01 | 1.073E+00 | 0.000E+00 | FAIL ABUN  |
| PA-233  | -2.271E-02 | 6.596E-02 | 1.080E-01 | 0.000E+00 | FAIL ABUN  |
| PA-234  | -6.421E-02 | 2.879E-01 | 4.843E-01 | 0.000E+00 | NOT IDENT. |
| PA-234M | 7.332E+00  | 4.957E+00 | 9.221E+00 | 0.000E+00 | NOT IDENT. |
| TH-234  | 1.400E+00  | 1.413E+00 | 2.445E+00 | 0.000E+00 | FAIL ABUN  |
| U-238   | 1.400E+00  | 1.413E+00 | 2.445E+00 | 0.000E+00 | FAIL ABUN  |
| NP-239  | 1.496E-01  | 3.813E-01 | 6.952E-01 | 0.000E+00 | FAIL ABUN  |
| AM-241  | 4.472E-02  | 1.552E-01 | 2.657E-01 | 0.000E+00 | NOT IDENT. |
| CM-247  | 1.021E-02  | 3.645E-02 | 6.501E-02 | 0.000E+00 | FAIL ABUN  |
| CF-249  | 4.469E-02  | 3.886E-02 | 7.212E-02 | 0.000E+00 | NOT IDENT. |

|        |            |           |           |                      |
|--------|------------|-----------|-----------|----------------------|
| CF-251 | -1.192E-02 | 1.236E-01 | 2.154E-01 | 0.000E+00 NOT IDENT. |
|--------|------------|-----------|-----------|----------------------|



```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29414                             *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964001.CNF;1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 21:17:10
Sample ID        : G247964001 Sample quantity   : 1.36530E+02 GRAM
Detector name    : GAM16 Detector geometry: CAN
Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:02.63 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity       : 5.00000
Batch ID        : 958216 Detector SN#       :
Matrix Spike ID  : LCS ID                  : 1032-A
*****

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## Nuclide Line Activity Report

## Nuclide Type:

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|-------------------------|------------------------|-------------------|
| K-40    | 1460.82 | 1762  | 10.66* | 1.208E+00 | 3.763E+01               | 3.763E+01              | 10.16             |
| CD-109  | 88.03   | 444   | 3.70*  | 6.255E+00 | 5.279E+00               | 5.435E+00              | 23.78             |
| SN-126  | 64.28   | ----- | 9.60   | 3.681E+00 | -----                   | Line Not Found         | -----             |
|         | 86.94   | 444   | 8.90   | 6.255E+00 | 2.195E+00               | 2.195E+00              | 46.92             |
|         | 87.57   | 444   | 37.00* | 6.255E+00 | 5.279E-01               | 5.279E-01              | 23.78             |
| CE-141  | 145.44  | 108   | 48.29* | 6.938E+00 | 8.843E-02               | 1.338E-01              | 71.80             |
| EU-155  | 86.55   | 444   | 30.70  | 6.255E+00 | 6.362E-01               | 6.412E-01              | 23.81             |
|         | 105.31  | 107   | 21.10* | 7.050E+00 | 1.979E-01               | 1.994E-01              | 73.15             |
| HG-203  | 70.83   | ----- | 3.69   | 4.611E+00 | -----                   | Line Not Found         | -----             |
|         | 72.87   | ----- | 6.19   | 4.872E+00 | -----                   | Line Not Found         | -----             |
|         | 279.20  | 86    | 81.56* | 4.685E+00 | 6.203E-02               | 8.283E-02              | 90.69             |
| TL-208  | 277.37  | 86    | 6.60   | 4.685E+00 | 7.666E-01               | 7.666E-01              | 91.12             |
|         | 583.19  | 696   | 85.00* | 2.668E+00 | 8.439E-01               | 8.439E-01              | 14.70             |
|         | 860.56  | 126   | 12.50  | 1.919E+00 | 1.440E+00               | 1.440E+00              | 37.18             |
| BI-211  | 72.87   | ----- | 1.23   | 4.872E+00 | -----                   | Line Not Found         | -----             |
|         | 351.06  | 1160  | 12.92* | 3.940E+00 | 6.262E+00               | 6.262E+00              | 13.30             |
| BI-212  | 727.33  | 149   | 6.67*  | 2.220E+00 | 2.764E+00               | 2.764E+00              | 30.66             |
|         | 785.37  | ----- | 1.10   | 2.079E+00 | -----                   | Line Not Found         | -----             |
|         | 1620.50 | 21    | 1.47   | 1.117E+00 | 3.494E+00               | 3.494E+00              | 86.70             |
| PB-212  | 74.82   | 713   | 10.28  | 5.111E+00 | 3.730E+00               | 3.730E+00              | 18.53             |
|         | 77.11   | 1096  | 17.10  | 5.364E+00 | 3.286E+00               | 3.286E+00              | 12.57             |
|         | 238.63  | 2135  | 43.60* | 5.225E+00 | 2.576E+00               | 2.576E+00              | 12.87             |
|         | 300.09  | 210   | 3.30   | 4.428E+00 | 3.958E+00               | 3.958E+00              | 37.76             |
| BI-214  | 609.32  | 812   | 45.49* | 2.574E+00 | 1.907E+00               | 1.908E+00              | 14.17             |
|         | 1120.29 | 189   | 14.92  | 1.516E+00 | 2.302E+00               | 2.302E+00              | 26.91             |
|         | 1764.49 | 174   | 15.30  | 1.056E+00 | 2.958E+00               | 2.959E+00              | 18.76             |
| PB-214  | 74.82   | 713   | 5.80   | 5.111E+00 | 6.612E+00               | 6.612E+00              | 17.65             |
|         | 77.11   | 1096  | 9.70   | 5.364E+00 | 5.793E+00               | 5.793E+00              | 15.04             |
|         | 242.00  | 631   | 7.25   | 5.179E+00 | 4.620E+00               | 4.620E+00              | 20.86             |
|         | 295.22  | 696   | 18.42  | 4.486E+00 | 2.314E+00               | 2.314E+00              | 18.13             |
|         | 351.93  | 1160  | 35.60* | 3.940E+00 | 2.273E+00               | 2.273E+00              | 14.40             |
| RA-224  | 240.99  | 631   | 4.10*  | 5.179E+00 | 8.170E+00               | 8.170E+00              | 20.04             |

Nuclide Type:

| Nuclide | Energy  | Area  | %Abn    | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|---------|-------|---------|-----------|-------------------------|------------------------|-------------------|
| RA-226  | 609.32  | 812   | 45.49*  | 2.574E+00 | 1.907E+00               | 1.908E+00              | 14.17             |
|         | 1120.29 | 189   | 14.92   | 1.516E+00 | 2.302E+00               | 2.302E+00              | 26.91             |
|         | 1764.49 | 174   | 15.30   | 1.056E+00 | 2.958E+00               | 2.959E+00              | 18.76             |
| AC-228  | 338.32  | 392   | 11.27   | 4.058E+00 | 2.358E+00               | 2.358E+00              | 46.09             |
|         | 911.20  | 422   | 25.80*  | 1.824E+00 | 2.467E+00               | 2.467E+00              | 18.58             |
|         | 968.97  | 230   | 15.80   | 1.727E+00 | 2.320E+00               | 2.320E+00              | 31.32             |
| RA-228  | 338.32  | 392   | 11.27   | 4.058E+00 | 2.358E+00               | 2.358E+00              | 46.09             |
|         | 911.20  | 422   | 25.80*  | 1.824E+00 | 2.467E+00               | 2.467E+00              | 18.58             |
|         | 968.97  | 230   | 15.80   | 1.727E+00 | 2.320E+00               | 2.320E+00              | 31.32             |
| TH-228  | 74.82   | 713   | 10.28   | 5.111E+00 | 3.730E+00               | 3.730E+00              | 15.82             |
|         | 77.11   | 1096  | 17.10   | 5.364E+00 | 3.286E+00               | 3.286E+00              | 12.57             |
|         | 238.63  | 2135  | 43.60*  | 5.225E+00 | 2.576E+00               | 2.576E+00              | 12.87             |
|         | 300.09  | 210   | 3.30    | 4.428E+00 | 3.958E+00               | 3.958E+00              | 71.15             |
| TH-232  | 338.32  | 392   | 11.27   | 4.058E+00 | 2.358E+00               | 2.358E+00              | 21.41             |
|         | 911.20  | 422   | 25.80*  | 1.824E+00 | 2.467E+00               | 2.467E+00              | 18.58             |
|         | 968.97  | 230   | 15.80   | 1.727E+00 | 2.320E+00               | 2.320E+00              | 31.32             |
| U-235   | 89.96   | 311   | 3.47    | 6.431E+00 | 3.826E+00               | 3.826E+00              | 35.03             |
|         | 93.35   | 493   | 5.60    | 6.597E+00 | 3.667E+00               | 3.667E+00              | 30.85             |
|         | 143.76  | 108   | 10.96*  | 6.938E+00 | 3.896E-01               | 3.896E-01              | 73.25             |
|         | 163.33  | ----- | 5.08    | 6.588E+00 | -----                   | Line Not Found         | -----             |
|         | 185.72  | 380   | 57.20   | 6.146E+00 | 2.969E-01               | 2.969E-01              | 27.35             |
| NP-237  | 205.31  | ----- | 5.01    | 5.780E+00 | -----                   | Line Not Found         | -----             |
|         | 86.48   | 444   | 12.40*  | 6.255E+00 | 1.575E+00               | 1.575E+00              | 31.71             |
|         | 95.86   | ----- | 2.68    | 6.742E+00 | -----                   | Line Not Found         | -----             |
| ANH-511 | 511.00  | 195   | 100.00* | 2.966E+00 | 1.809E-01               | 1.809E-01              | 35.38             |

Flag: "\*" = Keyline

Total number of lines in spectrum 42  
Number of unidentified lines 9  
Number of lines tentatively identified by NID 33 78.57%

Nuclide Type :

| Nuclide | Hlife     | Decay | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|-------|-------------------------|------------------------|-----------------------------|-------------------|-------|
| K-40    | 1.25E+09Y | 1.00  | 3.763E+01               | 3.763E+01              | 0.382E+01                   | 10.16             |       |
| CD-109  | 461.40D   | 1.03  | 5.279E+00               | 5.435E+00              | 1.293E+00                   | 23.78             |       |
| SN-126  | 2.30E+05Y | 1.00  | 5.279E-01               | 5.279E-01              | 1.255E-01                   | 23.78             |       |
| CE-141  | 32.51D    | 1.51  | 8.843E-02               | 1.338E-01              | 0.961E-01                   | 71.80             |       |
| EU-155  | 4.75Y     | 1.01  | 1.979E-01               | 1.994E-01              | 1.459E-01                   | 73.15             |       |
| HG-203  | 46.59D    | 1.34  | 6.203E-02               | 8.283E-02              | 7.511E-02                   | 90.69             |       |
| TL-208  | 1.41E+10Y | 1.00  | 8.439E-01               | 8.439E-01              | 1.240E-01                   | 14.70             |       |
| BI-211  | 7.04E+08Y | 1.00  | 6.262E+00               | 6.262E+00              | 0.833E+00                   | 13.30             |       |
| BI-212  | 1.41E+10Y | 1.00  | 2.764E+00               | 2.764E+00              | 0.848E+00                   | 30.66             |       |
| PB-212  | 1.41E+10Y | 1.00  | 2.576E+00               | 2.576E+00              | 0.332E+00                   | 12.87             |       |
| BI-214  | 1600.00Y  | 1.00  | 1.907E+00               | 1.908E+00              | 0.270E+00                   | 14.17             |       |
| PB-214  | 1600.00Y  | 1.00  | 2.273E+00               | 2.273E+00              | 0.327E+00                   | 14.40             |       |
| RA-224  | 1.41E+10Y | 1.00  | 8.170E+00               | 8.170E+00              | 1.637E+00                   | 20.04             |       |
| RA-226  | 1600.00Y  | 1.00  | 1.907E+00               | 1.908E+00              | 0.270E+00                   | 14.17             |       |
| AC-228  | 1.41E+10Y | 1.00  | 2.467E+00               | 2.467E+00              | 0.458E+00                   | 18.58             |       |
| RA-228  | 1.41E+10Y | 1.00  | 2.467E+00               | 2.467E+00              | 0.458E+00                   | 18.58             |       |
| TH-228  | 1.41E+10Y | 1.00  | 2.576E+00               | 2.576E+00              | 0.332E+00                   | 12.87             |       |
| TH-232  | 1.41E+10Y | 1.00  | 2.467E+00               | 2.467E+00              | 0.458E+00                   | 18.58             |       |
| U-235   | 7.04E+08Y | 1.00  | 3.896E-01               | 3.896E-01              | 2.854E-01                   | 73.25             |       |
| NP-237  | 2.14E+06Y | 1.00  | 1.575E+00               | 1.575E+00              | 0.499E+00                   | 31.71             |       |
| ANH-511 | 1.00E+09Y | 1.00  | 1.809E-01               | 1.809E-01              | 0.640E-01                   | 35.38             |       |

Total Activity : 8.262E+01 8.284E+01

Grand Total Activity : 8.262E+01 8.284E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 128.78  | 74   | 541   | 0.98 | 257.76  | 255  | 8  | 1.03E-02 | **** | 7.13E+00 |       |
| 0  | 209.34  | 196  | 486   | 0.93 | 418.88  | 415  | 10 | 2.72E-02 | 44.9 | 5.71E+00 |       |
| 0  | 270.39  | 188  | 280   | 1.23 | 540.98  | 536  | 10 | 2.61E-02 | 36.5 | 4.78E+00 | T     |
| 0  | 328.23  | 97   | 203   | 1.21 | 656.64  | 652  | 9  | 1.34E-02 | 56.9 | 4.15E+00 | T     |
| 0  | 409.33  | 61   | 85    | 1.00 | 818.84  | 816  | 6  | 8.53E-03 | 53.7 | 3.52E+00 |       |
| 0  | 462.99  | 106  | 157   | 1.18 | 926.15  | 921  | 10 | 1.48E-02 | 48.2 | 3.20E+00 | T     |
| 0  | 562.66  | 43   | 114   | 1.12 | 1125.47 | 1119 | 10 | 5.99E-03 | 97.8 | 2.75E+00 | T     |
| 0  | 768.33  | 68   | 134   | 1.01 | 1536.74 | 1531 | 12 | 9.48E-03 | 72.7 | 2.12E+00 |       |
| 0  | 794.87  | 57   | 79    | 1.40 | 1589.81 | 1585 | 9  | 7.98E-03 | 64.0 | 2.06E+00 | T     |
| 0  | 934.70  | 38   | 104   | 1.74 | 1869.39 | 1863 | 15 | 5.32E-03 | **** | 1.78E+00 |       |
| 0  | 964.88  | 71   | 60    | 1.30 | 1929.73 | 1925 | 9  | 9.83E-03 | 46.3 | 1.73E+00 | T     |
| 0  | 1238.38 | 63   | 98    | 1.75 | 2476.55 | 2469 | 14 | 8.73E-03 | 72.0 | 1.39E+00 | T     |
| 0  | 1378.48 | 36   | 48    | 1.58 | 2756.64 | 2748 | 16 | 5.00E-03 | 92.3 | 1.27E+00 |       |
| 0  | 1589.62 | 108  | 12    | 4.41 | 3178.71 | 3169 | 24 | 1.50E-02 | 25.7 | 1.13E+00 |       |
| 0  | 1730.08 | 37   | 13    | 1.57 | 3459.49 | 3453 | 13 | 5.14E-03 | 51.9 | 1.07E+00 |       |
| 0  | 1847.56 | 44   | 3     | 2.03 | 3694.29 | 3688 | 13 | 6.07E-03 | 34.7 | 1.03E+00 |       |

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                    *
*****
*                               DETECTOR DATA                          *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964001.CNF;1
* Acquisition date   : 10-MAR-2010 21:17:10  Detector SN#      :
* Detector ID        : GAM16                      Sensitivity    : 5.00000
* Geometry           : CAN                      Energy tolerance: 1.50000
* Elapsed live time  : 0 02:00:00.00           Abundance limit  : 75.00000
* Elapsed real time  : 0 02:00:02.63           Half life ratio  : 8.00000
*****
*                               SAMPLE DATA                            *
*
* Sample date        : 19-FEB-2010 12:00:00  Nuclide Library : SOLID
* Sample ID          : G247964001             Analyst initials: MXR1
* Batch Number       : 958216                 Sample Quantity  : 1.36530E+02 GRAM
*****
*                               QC DATA                               *
*
* CALIB. DATE/TIME   : 16-NOV-2009 11:22:16.1MS Isotope       :
* MSD ID              :                      MSD Isotope       :
* LCS ID              : 1032-A                LCS Isotope     :
*****

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## Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| K-40    | 3.763E+01              | 3.824E+00 | 5.722E-01         | 5.030E-02 | 65.770  |
| CD-109  | 5.435E+00              | 1.293E+00 | 1.169E+00         | 1.126E-01 | 4.651   |
| SN-126  | 5.279E-01              | 1.255E-01 | 1.140E-01         | 1.093E-02 | 4.630   |
| CE-141  | 1.338E-01              | 9.607E-02 | 1.055E-01         | 9.227E-03 | 1.269   |
| EU-155  | 1.994E-01              | 1.459E-01 | 1.660E-01         | 1.435E-02 | 1.201   |
| HG-203  | 8.283E-02              | 7.511E-02 | 6.460E-02         | 7.861E-03 | 1.282   |
| TL-208  | 8.439E-01              | 1.240E-01 | 5.883E-02         | 5.825E-03 | 14.345  |
| BI-211  | 6.262E+00              | 8.331E-01 | 3.234E-01         | 3.537E-02 | 19.363  |
| BI-212  | 2.764E+00              | 8.475E-01 | 7.590E-01         | 9.726E-02 | 3.641   |
| PB-212  | 2.576E+00              | 3.317E-01 | 9.276E-02         | 1.102E-02 | 27.776  |
| BI-214  | 1.908E+00              | 2.702E-01 | 1.080E-01         | 1.147E-02 | 17.665  |
| PB-214  | 2.273E+00              | 3.273E-01 | 1.182E-01         | 1.445E-02 | 19.229  |
| RA-224  | 8.170E+00              | 1.637E+00 | 9.944E-01         | 1.096E-01 | 8.216   |
| RA-226  | 1.908E+00              | 2.702E-01 | 1.080E-01         | 1.147E-02 | 17.665  |
| AC-228  | 2.467E+00              | 4.585E-01 | 2.270E-01         | 2.772E-02 | 10.866  |
| RA-228  | 2.467E+00              | 4.585E-01 | 2.270E-01         | 2.772E-02 | 10.866  |
| TH-228  | 2.576E+00              | 3.317E-01 | 9.276E-02         | 1.102E-02 | 27.776  |
| TH-232  | 2.467E+00              | 4.585E-01 | 2.270E-01         | 2.772E-02 | 10.866  |

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| U-235   | 3.896E-01              | 2.854E-01 | 3.147E-01         | 5.325E-02 | 1.238   |
| NP-237  | 1.575E+00              | 4.994E-01 | 3.440E-01         | 7.914E-02 | 4.578   |
| ANH-511 | 1.809E-01              | 6.400E-02 | 4.598E-02         | 4.373E-03 | 3.934   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| BE-7    | 1.439E-01                          |              | 3.513E-01 | 5.957E-01         | 6.024E-02 | 0.242   |
| NA-22   | -2.111E-02                         |              | 4.562E-02 | 7.057E-02         | 5.872E-03 | -0.299  |
| NA-24   | 3.438E+01                          |              | 4.057E+01 | Half-Life         | too short |         |
| SC-46   | -1.539E-02                         |              | 4.282E-02 | 6.952E-02         | 6.572E-03 | -0.221  |
| V-48    | 2.486E-02                          |              | 9.174E-02 | 1.552E-01         | 1.429E-02 | 0.160   |
| CR-51   | -2.759E-02                         |              | 4.347E-01 | 6.855E-01         | 8.010E-02 | -0.040  |
| MN-54   | -1.504E-02                         |              | 3.812E-02 | 6.216E-02         | 5.838E-03 | -0.242  |
| CO-56   | 1.757E-02                          |              | 3.695E-02 | 6.433E-02         | 6.053E-03 | 0.273   |
| CO-57   | -4.620E-03                         |              | 2.401E-02 | 3.993E-02         | 3.318E-03 | -0.116  |
| CO-58   | -3.485E-03                         |              | 3.940E-02 | 6.585E-02         | 6.169E-03 | -0.053  |
| FE-59   | -2.346E-02                         |              | 9.870E-02 | 1.587E-01         | 1.475E-02 | -0.148  |
| CO-60   | 4.017E-02                          |              | 3.738E-02 | 6.760E-02         | 5.702E-03 | 0.594   |
| ZN-65   | -6.126E-02                         |              | 1.045E-01 | 1.372E-01         | 1.165E-02 | -0.447  |
| SE-75   | -4.212E-02                         |              | 4.667E-02 | 6.672E-02         | 7.787E-03 | -0.631  |
| SR-85   | 2.374E-02                          |              | 4.298E-02 | 6.505E-02         | 6.185E-03 | 0.365   |
| Y-88    | 2.803E-02                          |              | 3.521E-02 | 6.526E-02         | 5.298E-03 | 0.430   |
| Y-91    | 1.419E+01                          |              | 2.438E+01 | 4.149E+01         | 3.374E+00 | 0.342   |
| NB-94   | 3.122E-02                          |              | 3.346E-02 | 5.747E-02         | 5.195E-03 | 0.543   |
| NB-95   | 6.577E-02                          |              | 5.620E-02 | 8.669E-02         | 8.013E-03 | 0.759   |
| NB-95M  | -7.890E-02                         |              | 1.554E-01 | 2.171E-01         | 2.585E-02 | -0.363  |
| ZR-95   | 1.006E-01                          |              | 8.263E-02 | 1.433E-01         | 1.443E-02 | 0.702   |
| MO-99   | -3.994E+01                         |              | 3.935E+01 | 5.692E+01         | 9.144E+00 | -0.702  |
| TC-99M  | -2.180E+14                         |              | 2.737E+15 | Half-Life         | too short |         |
| RU-103  | -2.187E-03                         |              | 4.037E-02 | 6.645E-02         | 9.660E-03 | -0.033  |
| RH-106  | -1.631E-01                         |              | 3.146E-01 | 4.894E-01         | 6.658E-02 | -0.333  |
| RU-106  | -1.631E-01                         |              | 3.141E-01 | 4.894E-01         | 4.476E-02 | -0.333  |
| AG-108M | -1.592E-02                         |              | 2.860E-02 | 4.602E-02         | 4.453E-03 | -0.346  |
| AG-110M | -9.761E-03                         |              | 3.493E-02 | 5.526E-02         | 5.058E-03 | -0.177  |
| SN-113  | -3.979E-02                         |              | 4.497E-02 | 7.158E-02         | 6.794E-03 | -0.556  |
| CD-115  | -3.212E-05                         |              | 2.178E-05 | Half-Life         | too short |         |
| SN-117M | -8.378E-02                         |              | 7.108E-02 | 1.118E-01         | 9.931E-03 | -0.749  |
| TE-123M | -2.067E-02                         |              | 3.009E-02 | 4.840E-02         | 4.328E-03 | -0.427  |
| SB-124  | 8.177E-03                          |              | 8.380E-02 | 1.408E-01         | 1.236E-02 | 0.058   |
| SB-125  | -1.553E-02                         |              | 9.120E-02 | 1.508E-01         | 1.440E-02 | -0.103  |
| TE-125M | 6.747E+00                          |              | 1.089E+01 | 1.690E+01         | 1.749E+00 | 0.399   |
| I-126   | 1.503E-01                          |              | 2.903E-01 | 4.860E-01         | 4.323E-02 | 0.309   |
| SB-126  | 1.089E-01                          |              | 1.965E-01 | 3.073E-01         | 2.798E-02 | 0.355   |
| SB-127  | -1.758E+00                         |              | 2.965E+00 | 4.488E+00         | 5.814E-01 | -0.392  |
| I-131   | 2.533E-02                          |              | 1.622E-01 | 2.758E-01         | 2.924E-02 | 0.092   |
| TE-132  | 1.867E+00                          |              | 1.951E+00 | 3.239E+00         | 5.794E-01 | 0.576   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| BA-133  | -2.198E-02                         |              | 4.569E-02 | 6.561E-02           | 9.333E-03 | -0.335  |
| I-133   | 3.623E-02                          |              | 9.151E-02 | Half-Life too short |           |         |
| CS-134  | 1.016E-01                          | +            | 6.566E-02 | 1.016E-01           | 9.522E-03 | 1.000   |
| CS-135  | 2.559E-01                          |              | 1.718E-01 | 2.649E-01           | 3.378E-02 | 0.966   |
| I-135   | 2.087E+14                          |              | 1.610E+14 | Half-Life too short |           |         |
| CS-136  | 1.003E-02                          |              | 1.393E-01 | 2.301E-01           | 2.130E-02 | 0.044   |
| BA-137M | -2.886E-02                         |              | 3.551E-02 | 5.357E-02           | 4.754E-03 | -0.539  |
| CS-137  | -3.049E-02                         |              | 3.751E-02 | 5.659E-02           | 5.031E-03 | -0.539  |
| CE-139  | -1.668E-02                         |              | 2.967E-02 | 4.778E-02           | 4.333E-03 | -0.349  |
| BA-140  | -1.099E-02                         |              | 3.451E-01 | 5.657E-01           | 1.932E-01 | -0.019  |
| LA-140  | 3.295E-02                          |              | 1.099E-01 | 1.674E-01           | 1.426E-02 | 0.197   |
| CE-143  | 4.825E-03                          |              | 9.310E-04 | Half-Life too short |           |         |
| CE-144  | -3.803E-02                         |              | 2.226E-01 | 3.302E-01           | 5.005E-02 | -0.115  |
| PM-144  | -1.703E-02                         |              | 3.349E-02 | 5.162E-02           | 4.657E-03 | -0.330  |
| PR-144  | -1.270E+00                         |              | 2.513E+00 | 3.874E+00           | 3.493E-01 | -0.328  |
| PM-146  | 4.505E-03                          |              | 4.322E-02 | 7.171E-02           | 8.100E-03 | 0.063   |
| ND-147  | 8.251E-01                          |              | 7.507E-01 | 1.304E+00           | 2.018E-01 | 0.632   |
| PM-149  | -3.014E-04                         |              | 1.811E-04 | Half-Life too short |           |         |
| EU-152  | -5.380E-02                         |              | 9.412E-02 | 1.490E-01           | 1.664E-02 | -0.361  |
| GD-153  | -4.549E-02                         |              | 8.965E-02 | 1.330E-01           | 1.182E-02 | -0.342  |
| EU-154  | -5.077E-02                         |              | 1.287E-01 | 2.004E-01           | 2.234E-02 | -0.253  |
| TB-160  | 2.202E-02                          |              | 1.367E-01 | 2.317E-01           | 2.189E-02 | 0.095   |
| HO-166M | 1.845E-02                          |              | 5.903E-02 | 9.731E-02           | 8.829E-03 | 0.190   |
| TA-182  | -5.231E-02                         |              | 2.140E-01 | 3.413E-01           | 2.791E-02 | -0.153  |
| IR-192  | -3.060E-02                         |              | 3.818E-02 | 5.740E-02           | 6.560E-03 | -0.533  |
| BI-207  | -2.379E-02                         |              | 5.428E-02 | 8.592E-02           | 7.574E-03 | -0.277  |
| PB-210  | 1.176E+00                          |              | 3.510E+00 | 5.571E+00           | 5.151E-01 | 0.211   |
| PB-211  | -2.852E-02                         |              | 7.885E-01 | 1.161E+00           | 5.632E-01 | -0.025  |
| RN-219  | 1.262E-01                          |              | 4.040E-01 | 6.878E-01           | 1.051E-01 | 0.183   |
| RA-223  | 2.916E-01                          |              | 7.199E-01 | 1.040E+00           | 1.954E-01 | 0.280   |
| AC-227  | -1.069E-01                         |              | 2.596E-01 | 4.078E-01           | 5.787E-02 | -0.262  |
| TH-227  | -1.069E-01                         |              | 2.597E-01 | 4.078E-01           | 6.334E-02 | -0.262  |
| TH-229  | 1.335E-01                          |              | 5.132E-01 | 8.476E-01           | 8.268E-02 | 0.158   |
| PA-231  | -6.340E-01                         |              | 1.530E+00 | 2.257E+00           | 3.785E-01 | -0.281  |
| TH-231  | 2.916E-01                          |              | 7.199E-01 | 1.040E+00           | 1.954E-01 | 0.280   |
| PA-233  | -2.271E-02                         |              | 6.731E-02 | 1.046E-01           | 1.223E-02 | -0.217  |
| PA-234  | -6.421E-02                         |              | 2.938E-01 | 4.790E-01           | 9.150E-02 | -0.134  |
| PA-234M | 7.332E+00                          |              | 5.058E+00 | 9.128E+00           | 9.504E-01 | 0.803   |
| TH-234  | 1.400E+00                          |              | 1.442E+00 | 2.300E+00           | 4.101E-01 | 0.609   |
| U-238   | 1.400E+00                          |              | 1.442E+00 | 2.300E+00           | 4.101E-01 | 0.609   |
| NP-239  | 1.496E-01                          |              | 3.891E-01 | 6.612E-01           | 5.504E-02 | 0.226   |
| AM-241  | 4.472E-02                          |              | 1.583E-01 | 2.497E-01           | 1.960E-02 | 0.179   |
| CM-247  | 1.021E-02                          |              | 3.720E-02 | 6.324E-02           | 5.880E-03 | 0.161   |
| CF-249  | 4.469E-02                          |              | 3.965E-02 | 7.012E-02           | 6.572E-03 | 0.637   |
| CF-251  | -1.192E-02                         |              | 1.261E-01 | 2.064E-01           | 1.929E-02 | -0.058  |

## VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                    *
*****
*                                     DETECTOR DATA                          *
*
* Configuration      : SYS$SYSROOT:[ALPHA.ARCHIVE.GAMMA]G247964001          *
* Acquisition date   : 10-MAR-2010 21:17:10 Detector SN#                   *
* Detector ID        : GAM16                                           Sensitivity      : 5.000      *
* Geometry           : CAN                                           Energy tolerance: 1.500      *
* Elapsed live time  : 0 02:00:00.00                               Abundance limit : 75.000     *
* Elapsed real time  : 0 02:00:02.63                               Half life ratio  : 8.000     *
*****
*                                     SAMPLE DATA                            *
*
* Sample date        : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID          : G247964001                               Analyst initials: MXR1       *
* Batch Number       : 958216                                   Sample Quantity : 1.3653E+02 GRAM *
* Recovery           : 1.00000                                Carrier Weight  : 0.00000     *
*****
*                                     QC DATA                               *
*
* CALIB. DATE/TIME   : 16-NOV-2009 11:22:16 MS Isotope                  :
* MSD DPM             : 0.000                                       MSD Isotope       :
* LCS DPM             : 0.000                                       LCS Isotope       :
* LCSD DPM            : 0.000                                       LCSD Isotope      :
*****

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## Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act Error | DLC<br>(pCi/GRAM ) | TPU       |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.763E+01               | 3.747E+00 | 2.870E-01          | 1.912E+00 |
| CD-109  | 5.435E+00               | 1.267E+00 | 6.179E-01          | 6.463E-01 |
| SN-126  | 5.279E-01               | 1.230E-01 | 6.029E-02          | 6.277E-02 |
| CE-141  | 1.338E-01               | 9.415E-02 | 5.527E-02          | 4.804E-02 |
| EU-155  | 1.994E-01               | 1.430E-01 | 8.748E-02          | 7.294E-02 |
| HG-203  | 8.283E-02               | 7.361E-02 | 3.345E-02          | 3.756E-02 |
| TL-208  | 8.439E-01               | 1.215E-01 | 3.004E-02          | 6.201E-02 |
| BI-211  | 6.262E+00               | 8.164E-01 | 1.667E-01          | 4.165E-01 |
| BI-212  | 2.764E+00               | 8.306E-01 | 3.859E-01          | 4.238E-01 |
| PB-212  | 2.576E+00               | 3.250E-01 | 4.817E-02          | 1.658E-01 |
| BI-214  | 1.908E+00               | 2.648E-01 | 5.509E-02          | 1.351E-01 |
| PB-214  | 2.273E+00               | 3.208E-01 | 6.094E-02          | 1.637E-01 |
| RA-224  | 8.170E+00               | 1.604E+00 | 5.163E-01          | 8.185E-01 |
| RA-226  | 1.908E+00               | 2.648E-01 | 5.509E-02          | 1.351E-01 |
| AC-228  | 2.467E+00               | 4.493E-01 | 1.150E-01          | 2.292E-01 |
| RA-228  | 2.467E+00               | 4.493E-01 | 1.150E-01          | 2.292E-01 |
| TH-228  | 2.576E+00               | 3.250E-01 | 4.817E-02          | 1.658E-01 |
| TH-232  | 2.467E+00               | 4.493E-01 | 1.150E-01          | 2.292E-01 |
| U-235   | 3.896E-01               | 2.797E-01 | 1.649E-01          | 1.427E-01 |
| NP-237  | 1.575E+00               | 4.894E-01 | 1.820E-01          | 2.497E-01 |
| ANH-511 | 1.809E-01               | 6.272E-02 | 2.354E-02          | 3.200E-02 |

## ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act error | DLC<br>(pCi/GRAM ) | TPU                  |
|---------|-------------------------------------|---------------|--------------------|----------------------|
| BE-7    | 1.439E-01                           | 3.442E-01     | 3.053E-01          | 1.756E-01 NOT IDENT. |
| NA-22   | -2.111E-02                          | 4.470E-02     | 3.549E-02          | 2.281E-02 NOT IDENT. |
| NA-24   | 3.438E+07                           | 7.952E+07     | 0.000E+00          | 4.057E+07 SHORT HLIF |
| SC-46   | -1.539E-02                          | 4.196E-02     | 3.521E-02          | 2.141E-02 FAIL ABUN  |
| V-48    | 2.486E-02                           | 8.991E-02     | 7.848E-02          | 4.587E-02 NOT IDENT. |
| CR-51   | -2.759E-02                          | 4.260E-01     | 3.540E-01          | 2.173E-01 NOT IDENT. |



|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| MN-54   | -1.504E-02 | 3.736E-02 | 3.152E-02 | 1.906E-02 | NOT IDENT. |
| CO-56   | 1.757E-02  | 3.621E-02 | 3.261E-02 | 1.847E-02 | FAIL ABUN  |
| CO-57   | -4.620E-03 | 2.353E-02 | 2.099E-02 | 1.201E-02 | NOT IDENT. |
| CO-58   | -3.485E-03 | 3.862E-02 | 3.341E-02 | 1.970E-02 | NOT IDENT. |
| FE-59   | -2.346E-02 | 9.673E-02 | 8.004E-02 | 4.935E-02 | NOT IDENT. |
| CO-60   | 4.017E-02  | 3.663E-02 | 3.397E-02 | 1.869E-02 | NOT IDENT. |
| ZN-65   | -6.126E-02 | 1.024E-01 | 6.918E-02 | 5.225E-02 | NOT IDENT. |
| SE-75   | -4.212E-02 | 4.573E-02 | 3.458E-02 | 2.333E-02 | FAIL ABUN  |
| SR-85   | 2.374E-02  | 4.212E-02 | 3.330E-02 | 2.149E-02 | NOT IDENT. |
| Y-88    | 2.803E-02  | 3.450E-02 | 3.259E-02 | 1.760E-02 | NOT IDENT. |
| Y-91    | 1.419E+01  | 2.390E+01 | 2.089E+01 | 1.219E+01 | NOT IDENT. |
| NB-94   | 3.122E-02  | 3.279E-02 | 2.924E-02 | 1.673E-02 | NOT IDENT. |
| NB-95   | 6.577E-02  | 5.508E-02 | 4.404E-02 | 2.810E-02 | NOT IDENT. |
| NB-95M  | -7.890E-02 | 1.523E-01 | 1.128E-01 | 7.770E-02 | NOT IDENT. |
| ZR-95   | 1.006E-01  | 8.098E-02 | 7.282E-02 | 4.132E-02 | NOT IDENT. |
| MO-99   | -3.994E+01 | 3.856E+01 | 2.894E+01 | 1.967E+01 | NOT IDENT. |
| TC-99M  | -2.180E+20 | 5.364E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | -2.187E-03 | 3.956E-02 | 3.404E-02 | 2.018E-02 | FAIL ABUN  |
| RH-106  | -1.631E-01 | 3.083E-01 | 2.496E-01 | 1.573E-01 | NOT IDENT. |
| RU-106  | -1.631E-01 | 3.079E-01 | 2.496E-01 | 1.571E-01 | NOT IDENT. |
| AG-108M | -1.592E-02 | 2.803E-02 | 2.363E-02 | 1.430E-02 | NOT IDENT. |
| AG-110M | -9.761E-03 | 3.423E-02 | 2.815E-02 | 1.746E-02 | NOT IDENT. |
| SN-113  | -3.979E-02 | 4.407E-02 | 3.683E-02 | 2.248E-02 | NOT IDENT. |
| CD-115  | -3.212E+01 | 4.270E+01 | 0.000E+00 | 2.178E+01 | SHORT HLIF |
| SN-117M | -8.378E-02 | 6.966E-02 | 5.850E-02 | 3.554E-02 | NOT IDENT. |
| TE-123M | -2.067E-02 | 2.949E-02 | 2.532E-02 | 1.505E-02 | NOT IDENT. |
| SB-124  | 8.177E-03  | 8.212E-02 | 7.044E-02 | 4.190E-02 | NOT IDENT. |
| SB-125  | -1.553E-02 | 8.938E-02 | 7.745E-02 | 4.560E-02 | FAIL ABUN  |
| TE-125M | 6.747E+00  | 1.067E+01 | 8.903E+00 | 5.445E+00 | NOT IDENT. |
| I-126   | 1.503E-01  | 2.844E-01 | 2.476E-01 | 1.451E-01 | NOT IDENT. |
| SB-126  | 1.089E-01  | 1.926E-01 | 1.563E-01 | 9.827E-02 | NOT IDENT. |
| SB-127  | -1.758E+00 | 2.905E+00 | 2.285E+00 | 1.482E+00 | NOT IDENT. |
| I-131   | 2.533E-02  | 1.589E-01 | 1.421E-01 | 8.109E-02 | NOT IDENT. |
| TE-132  | 1.867E+00  | 1.912E+00 | 1.683E+00 | 9.756E-01 | NOT IDENT. |
| BA-133  | -2.198E-02 | 4.477E-02 | 3.382E-02 | 2.284E-02 | NOT IDENT. |
| I-133   | 3.623E+04  | 1.794E+05 | 0.000E+00 | 9.151E+04 | SHORT HLIF |
| CS-134  | 1.016E-01  | 6.435E-02 | 5.155E-02 | 3.283E-02 | FAIL ABUN  |
| CS-135  | 2.559E-01  | 1.684E-01 | 1.373E-01 | 8.592E-02 | NOT IDENT. |
| I-135   | 2.087E+20  | 3.156E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | 1.003E-02  | 1.365E-01 | 1.162E-01 | 6.963E-02 | NOT IDENT. |
| BA-137M | -2.886E-02 | 3.480E-02 | 2.729E-02 | 1.775E-02 | NOT IDENT. |
| CS-137  | -3.049E-02 | 3.676E-02 | 2.883E-02 | 1.876E-02 | NOT IDENT. |
| CE-139  | -1.668E-02 | 2.908E-02 | 2.498E-02 | 1.483E-02 | NOT IDENT. |
| BA-140  | -1.099E-02 | 3.382E-01 | 2.893E-01 | 1.725E-01 | NOT IDENT. |
| LA-140  | 3.295E-02  | 1.077E-01 | 8.385E-02 | 5.495E-02 | FAIL ABUN  |
| CE-143  | 4.825E+03  | 1.825E+03 | 0.000E+00 | 9.310E+02 | SHORT HLIF |
| CE-144  | -3.803E-02 | 2.181E-01 | 1.733E-01 | 1.113E-01 | NOT IDENT. |
| PM-144  | -1.703E-02 | 3.282E-02 | 2.627E-02 | 1.674E-02 | NOT IDENT. |
| PR-144  | -1.270E+00 | 2.462E+00 | 1.972E+00 | 1.256E+00 | NOT IDENT. |
| PM-146  | 4.505E-03  | 4.235E-02 | 3.679E-02 | 2.161E-02 | NOT IDENT. |
| ND-147  | 8.251E-01  | 7.357E-01 | 6.673E-01 | 3.753E-01 | FAIL ABUN  |
| PM-149  | -3.014E+02 | 3.550E+02 | 0.000E+00 | 1.811E+02 | SHORT HLIF |
| EU-152  | -5.380E-02 | 9.224E-02 | 7.683E-02 | 4.706E-02 | FAIL ABUN  |
| GD-153  | -4.549E-02 | 8.785E-02 | 7.021E-02 | 4.482E-02 | NOT IDENT. |
| EU-154  | -5.077E-02 | 1.261E-01 | 1.008E-01 | 6.433E-02 | NOT IDENT. |
| TB-160  | 2.202E-02  | 1.340E-01 | 1.174E-01 | 6.837E-02 | FAIL ABUN  |
| HO-166M | 1.845E-02  | 5.785E-02 | 4.950E-02 | 2.952E-02 | FAIL ABUN  |
| TA-182  | -5.231E-02 | 2.097E-01 | 1.718E-01 | 1.070E-01 | FAIL ABUN  |
| IR-192  | -3.060E-02 | 3.742E-02 | 2.965E-02 | 1.909E-02 | FAIL ABUN  |
| BI-207  | -2.379E-02 | 5.320E-02 | 4.337E-02 | 2.714E-02 | FAIL ABUN  |
| PB-210  | 1.176E+00  | 3.440E+00 | 2.979E+00 | 1.755E+00 | NOT IDENT. |
| PB-211  | -2.852E-02 | 7.728E-01 | 5.969E-01 | 3.943E-01 | NOT IDENT. |
| RN-219  | 1.262E-01  | 3.959E-01 | 3.537E-01 | 2.020E-01 | FAIL ABUN  |
| RA-223  | 2.916E-01  | 7.055E-01 | 5.370E-01 | 3.600E-01 | FAIL ABUN  |
| AC-227  | -1.069E-01 | 2.544E-01 | 2.115E-01 | 1.298E-01 | FAIL ABUN  |
| TH-227  | -1.069E-01 | 2.545E-01 | 2.115E-01 | 1.298E-01 | FAIL ABUN  |
| TH-229  | 1.335E-01  | 5.030E-01 | 4.418E-01 | 2.566E-01 | FAIL ABUN  |
| PA-231  | -6.340E-01 | 1.500E+00 | 1.168E+00 | 7.652E-01 | FAIL ABUN  |
| TH-231  | 2.916E-01  | 7.055E-01 | 5.370E-01 | 3.600E-01 | FAIL ABUN  |
| PA-233  | -2.271E-02 | 6.596E-02 | 5.404E-02 | 3.365E-02 | FAIL ABUN  |
| PA-234  | -6.421E-02 | 2.879E-01 | 2.423E-01 | 1.469E-01 | NOT IDENT. |
| PA-234M | 7.332E+00  | 4.957E+00 | 4.613E+00 | 2.529E+00 | NOT IDENT. |
| TH-234  | 1.400E+00  | 1.413E+00 | 1.223E+00 | 7.208E-01 | FAIL ABUN  |
| U-238   | 1.400E+00  | 1.413E+00 | 1.223E+00 | 7.208E-01 | FAIL ABUN  |
| NP-239  | 1.496E-01  | 3.813E-01 | 3.478E-01 | 1.945E-01 | FAIL ABUN  |
| AM-241  | 4.472E-02  | 1.552E-01 | 1.329E-01 | 7.916E-02 | NOT IDENT. |
| CM-247  | 1.021E-02  | 3.645E-02 | 3.252E-02 | 1.860E-02 | FAIL ABUN  |
| CF-249  | 4.469E-02  | 3.886E-02 | 3.608E-02 | 1.983E-02 | NOT IDENT. |

CF-251

-1.192E-02

1.236E-01

1.077E-01

6.306E-02 NOT IDENT.

\*\*\*\*\*  
 \* GEL Laboratories LLC \*  
 \* 2040 SAVAGE ROAD \*  
 \* CHARLESTON ,SC 29417 \*  
 \* GAMMA SPECTROSCOPY BACKGROUND REPORT \*  
 \*\*\*\*\*

| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 326.8237   |
| 49.72  | 311.0591   |
| 57.36  | 0.0000     |
| 59.54  | 409.0237   |
| 63.29  | 448.8480   |
| 63.29  | 448.8480   |
| 64.28  | 447.5183   |
| 67.75  | 477.6250   |
| 69.67  | 484.8897   |
| 70.83  | 510.1174   |
| 72.81  | 525.1479   |
| 72.87  | 525.2209   |
| 72.87  | 525.2209   |
| 74.82  | 528.4595   |
| 74.82  | 528.4595   |
| 74.82  | 528.4595   |
| 74.97  | 528.6439   |
| 77.11  | 531.2347   |
| 77.11  | 531.2347   |
| 77.11  | 531.2347   |
| 79.69  | 487.2954   |
| 79.80  | 487.4142   |
| 80.12  | 421.0107   |
| 80.19  | 421.0758   |
| 80.57  | 488.2405   |
| 81.00  | 488.7015   |
| 81.07  | 488.7769   |
| 81.07  | 488.7769   |
| 83.79  | 426.1092   |
| 83.79  | 426.1092   |
| 85.43  | 427.5966   |
| 86.48  | 428.5414   |
| 86.55  | 428.6042   |
| 86.79  | 428.8178   |
| 86.94  | 428.9560   |
| 87.57  | 429.5188   |
| 88.03  | 429.9283   |
| 88.47  | 430.3203   |
| 89.96  | 431.6369   |
| 91.11  | 432.6445   |
| 92.59  | 433.9335   |
| 92.59  | 433.9335   |
| 93.35  | 434.5918   |
| 94.67  | 343.9973   |
| 94.87  | 363.9860   |
| 94.87  | 363.9860   |
| 95.86  | 416.4132   |
| 97.43  | 400.3925   |
| 98.44  | 357.1888   |
| 99.53  | 351.7004   |
| 100.11 | 378.8291   |
| 103.18 | 356.3606   |
| 103.37 | 356.4880   |
| 105.31 | 366.3141   |
| 106.12 | 359.6455   |
| 109.28 | 365.7786   |
| 111.00 | 381.8982   |
| 111.76 | 398.7977   |
| 116.30 | 356.0613   |
| 117.23 | 360.3023   |
| 121.12 | 337.6837   |
| 121.78 | 348.2410   |
| 122.06 | 342.8439   |
| 123.07 | 335.0609   |
| 131.20 | 382.2475   |
| 133.52 | 385.0483   |
| 136.00 | 344.8380   |

|        |          |
|--------|----------|
| 136.47 | 356.4587 |
| 140.51 | 337.6583 |
| 140.51 | 0.0000   |
| 143.76 | 350.7910 |
| 144.24 | 351.0367 |
| 144.24 | 351.0367 |
| 145.44 | 331.4778 |
| 152.43 | 391.1073 |
| 153.25 | 383.7854 |
| 154.21 | 366.7873 |
| 154.21 | 366.7873 |
| 156.02 | 385.2721 |
| 158.56 | 416.9690 |
| 159.00 | 396.6490 |
| 162.66 | 362.2088 |
| 163.33 | 380.2672 |
| 165.86 | 343.0042 |
| 176.60 | 325.7670 |
| 177.52 | 315.1084 |
| 181.07 | 291.8177 |
| 184.41 | 342.1191 |
| 185.72 | 342.6692 |
| 193.51 | 294.7324 |
| 197.04 | 340.1484 |
| 205.31 | 365.7173 |
| 210.85 | 299.1020 |
| 215.65 | 303.3171 |
| 222.11 | 267.4022 |
| 227.38 | 292.2882 |
| 228.16 | 271.2540 |
| 228.18 | 271.2592 |
| 235.69 | 353.7906 |
| 235.96 | 331.3709 |
| 235.96 | 331.3709 |
| 238.63 | 273.1332 |
| 238.63 | 273.1332 |
| 240.99 | 273.7869 |
| 242.00 | 274.0659 |
| 244.70 | 227.2031 |
| 252.40 | 214.7653 |
| 252.80 | 241.0241 |
| 256.23 | 245.1094 |
| 256.23 | 245.1094 |
| 260.90 | 0.0000   |
| 264.66 | 217.0838 |
| 268.22 | 182.6138 |
| 269.46 | 210.5261 |
| 269.46 | 210.5261 |
| 271.23 | 201.4365 |
| 273.65 | 200.2185 |
| 276.40 | 207.4147 |
| 277.37 | 207.5963 |
| 277.60 | 207.6417 |
| 278.00 | 207.7174 |
| 279.20 | 207.9407 |
| 279.54 | 216.3923 |
| 280.46 | 221.6100 |
| 283.69 | 210.1315 |
| 284.31 | 211.1443 |
| 285.41 | 231.5865 |
| 285.90 | 0.0000   |
| 287.50 | 188.0925 |
| 293.27 | 0.0000   |
| 295.22 | 171.7937 |
| 295.96 | 173.6067 |
| 298.57 | 173.9958 |
| 299.98 | 174.2075 |
| 299.98 | 174.2075 |
| 300.09 | 174.2230 |
| 300.09 | 174.2230 |
| 300.13 | 174.2292 |
| 301.36 | 174.4129 |
| 302.85 | 167.7855 |
| 304.50 | 176.5943 |
| 304.50 | 176.5943 |
| 304.85 | 176.6478 |
| 308.46 | 174.3182 |
| 311.90 | 197.8217 |

|        |          |
|--------|----------|
| 316.51 | 206.6592 |
| 319.41 | 178.2191 |
| 320.08 | 193.3690 |
| 323.87 | 167.2529 |
| 323.87 | 167.2529 |
| 328.76 | 192.3993 |
| 333.37 | 161.5054 |
| 334.37 | 184.1228 |
| 334.37 | 184.1228 |
| 338.28 | 179.7545 |
| 338.28 | 179.7545 |
| 338.32 | 179.7607 |
| 338.32 | 179.7607 |
| 338.32 | 179.7607 |
| 340.48 | 175.1197 |
| 340.55 | 175.1288 |
| 344.28 | 174.0186 |
| 351.06 | 166.4071 |
| 351.93 | 168.1183 |
| 356.01 | 172.9257 |
| 364.49 | 153.7085 |
| 366.42 | 150.3270 |
| 383.85 | 157.6999 |
| 388.16 | 136.2362 |
| 388.63 | 143.5988 |
| 391.69 | 168.6564 |
| 400.66 | 150.3378 |
| 401.81 | 149.5341 |
| 402.40 | 151.4402 |
| 404.85 | 149.4756 |
| 410.95 | 132.2615 |
| 414.70 | 126.6346 |
| 423.72 | 133.9512 |
| 427.09 | 137.0644 |
| 427.87 | 144.6476 |
| 433.94 | 137.6748 |
| 453.88 | 128.9211 |
| 463.37 | 119.8812 |
| 468.07 | 104.8123 |
| 473.00 | 111.1167 |
| 476.78 | 131.7064 |
| 477.60 | 125.9573 |
| 487.02 | 112.0502 |
| 492.35 | 0.0000   |
| 497.08 | 104.8710 |
| 511.00 | 113.6155 |
| 514.00 | 117.1715 |
| 527.90 | 0.0000   |
| 529.87 | 0.0000   |
| 531.02 | 93.9139  |
| 537.26 | 115.2878 |
| 546.56 | 0.0000   |
| 563.25 | 113.8525 |
| 569.33 | 122.3730 |
| 569.50 | 122.3840 |
| 569.70 | 124.4387 |
| 583.19 | 108.8726 |
| 600.60 | 108.7971 |
| 602.73 | 99.5771  |
| 604.72 | 124.5959 |
| 609.32 | 97.8239  |
| 609.32 | 97.8239  |
| 610.33 | 109.9474 |
| 614.28 | 120.1781 |
| 618.01 | 95.1046  |
| 621.93 | 100.5234 |
| 621.93 | 100.5234 |
| 633.25 | 87.3846  |
| 635.95 | 85.3901  |
| 636.99 | 84.3774  |
| 645.85 | 86.8497  |
| 657.76 | 94.7906  |
| 661.66 | 104.5646 |
| 661.66 | 104.5646 |
| 664.57 | 0.0000   |
| 666.33 | 96.2347  |
| 666.50 | 93.0349  |
| 677.62 | 96.7319  |

|         |          |
|---------|----------|
| 685.70  | 97.0862  |
| 695.00  | 95.3235  |
| 696.49  | 93.2174  |
| 696.51  | 93.2200  |
| 697.00  | 86.7334  |
| 702.65  | 79.3425  |
| 706.68  | 103.4366 |
| 711.68  | 78.5654  |
| 720.70  | 74.4912  |
| 721.93  | 0.0000   |
| 722.78  | 89.4691  |
| 722.91  | 105.2637 |
| 723.31  | 105.2813 |
| 724.19  | 98.3008  |
| 727.33  | 77.3395  |
| 733.00  | 104.4621 |
| 735.93  | 72.7736  |
| 739.50  | 106.0107 |
| 747.24  | 99.7092  |
| 752.31  | 112.1332 |
| 753.82  | 103.3166 |
| 756.73  | 77.8592  |
| 763.94  | 74.9663  |
| 765.81  | 94.6728  |
| 766.42  | 100.0590 |
| 777.92  | 80.7825  |
| 778.90  | 97.6493  |
| 783.70  | 82.0938  |
| 785.37  | 90.9271  |
| 795.86  | 81.3647  |
| 801.95  | 96.9688  |
| 810.29  | 84.5583  |
| 810.76  | 75.4802  |
| 815.77  | 85.6511  |
| 818.51  | 68.4100  |
| 832.01  | 88.9411  |
| 834.85  | 94.5432  |
| 836.80  | 0.0000   |
| 846.77  | 57.1684  |
| 856.80  | 66.3319  |
| 860.56  | 75.0753  |
| 871.09  | 63.2735  |
| 873.19  | 85.6705  |
| 875.33  | 0.0000   |
| 879.36  | 61.5995  |
| 880.51  | 81.2333  |
| 883.24  | 61.6865  |
| 884.68  | 64.5241  |
| 889.28  | 83.3680  |
| 898.04  | 87.3896  |
| 911.20  | 69.8646  |
| 911.20  | 69.8646  |
| 911.20  | 69.8646  |
| 926.50  | 67.5017  |
| 937.49  | 79.4067  |
| 944.13  | 65.9004  |
| 946.00  | 67.8539  |
| 949.00  | 68.8816  |
| 962.29  | 94.5018  |
| 964.08  | 81.7378  |
| 966.15  | 38.4922  |
| 968.97  | 69.0317  |
| 968.97  | 69.0317  |
| 968.97  | 69.0317  |
| 983.53  | 72.5958  |
| 996.26  | 89.4282  |
| 1001.03 | 54.5207  |
| 1004.73 | 84.8059  |
| 1037.84 | 53.2037  |
| 1038.76 | 0.0000   |
| 1048.07 | 65.2394  |
| 1050.41 | 74.1907  |
| 1050.41 | 74.1907  |
| 1063.66 | 73.5086  |
| 1085.87 | 69.0168  |
| 1099.45 | 69.3032  |
| 1112.07 | 69.5694  |
| 1115.54 | 77.3779  |

|         |          |
|---------|----------|
| 1120.29 | 66.7090  |
| 1120.29 | 66.7090  |
| 1120.55 | 66.7122  |
| 1121.30 | 66.7283  |
| 1131.51 | 0.0000   |
| 1173.23 | 87.2620  |
| 1177.93 | 79.1543  |
| 1189.05 | 75.2813  |
| 1204.77 | 75.6199  |
| 1221.41 | 87.4207  |
| 1231.02 | 109.5681 |
| 1235.36 | 81.8369  |
| 1238.28 | 93.0589  |
| 1260.41 | 0.0000   |
| 1271.85 | 68.5864  |
| 1274.44 | 63.3574  |
| 1274.54 | 64.4134  |
| 1291.59 | 64.7083  |
| 1298.22 | 0.0000   |
| 1312.11 | 39.4625  |
| 1332.49 | 27.8776  |
| 1365.19 | 32.4375  |
| 1368.63 | 0.0000   |
| 1384.29 | 38.0266  |
| 1408.01 | 30.6018  |
| 1457.56 | 0.0000   |
| 1460.82 | 33.2124  |
| 1489.16 | 24.1486  |
| 1505.03 | 42.8835  |
| 1596.21 | 19.5804  |
| 1620.50 | 21.3263  |
| 1678.03 | 0.0000   |
| 1690.97 | 19.4320  |
| 1764.49 | 9.8653   |
| 1764.49 | 9.8653   |
| 1770.23 | 10.1589  |
| 1771.35 | 8.4678   |
| 1791.20 | 0.0000   |
| 1836.06 | 12.0093  |

TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G247964001

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 4.3454E+00 | ug/g |
| Total Uranium Counting Unc. | 4.2052E+00 | ug/g |
| Total Uranium Tpu           | 2.1455E-06 | ug/g |
| Total Uranium Mda           | 3.6403E+00 | ug/g |



```

*****
*
*               GEL Laboratories LLC               *
*               2040 SAVAGE ROAD                   *
*               CHARLESTON ,SC 29417               *
*               GROSS GAMMA REPORT                 *
*
*****
*
*  BATCH ID      : 958216                      SAMPLE ID : G247964001
*  ANALYST       : MXR1                        DETECTOR  : GAM16
*  SAMPLE DATE   : 19-FEB-2010 12:00:00.00    COUNT TIME : 0 02:00:00.00
*  ANALYSIS DATE : 10-MAR-2010 21:17:10.05    SAMPLE ALQT: 136.530 GRAM
*
*****

```

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GROSS GAMMA ACTIVITY (pCi/GRAM ) : 1.436E+01
GROSS GAMMA ERROR   (pCi/GRAM ) : 1.827E+00
GROSS GAMMA MDA     (pCi/GRAM ) : 4.830E+00
GROSS GAMMA DLC     (pCi/GRAM ) : 2.351E+00

```

## VAX/VMS Nuclide Identification Report Generated 10-MAR-2010 23:18:21.61

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                    *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964002.CNF;1
Sample date        : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 21:17:36
Sample ID          : G247964002 Sample quantity : 1.34670E+02 GRAM
Detector name      : GAM25 Detector geometry: CAN
Elapsed live time  : 0 02:00:00.00 Elapsed real time: 0 02:00:02.50 0.0%
Energy tolerance   : 1.50000 keV Analyst Initials : MXR1
Abundance limit    : 75.00000 Sensitivity : 5.00000
Batch ID           : 958216 Detector SN# :
Matrix Spike ID    : LCS ID : 1032-A
*****

```

| Pk | It | Energy   | Area | Bkgnd | FWHM  | Channel | Left | Pw | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|-------|---------|------|----|----------|------|----------|
| 1  | 0  | 46.39*   | 231  | 646   | 0.93  | 92.34   | 89   | 8  | 3.21E-02 | 20.9 |          |
| 2  | 0  | 63.26*   | 339  | 1038  | 0.77  | 126.09  | 122  | 9  | 4.71E-02 | 18.4 |          |
| 3  | 2  | 74.78*   | 1276 | 748   | 0.96  | 149.11  | 143  | 22 | 1.77E-01 | 4.4  | 1.73E+00 |
| 4  | 2  | 77.07*   | 2011 | 542   | 0.83  | 153.70  | 143  | 22 | 2.79E-01 | 2.9  |          |
| 5  | 7  | 84.11*   | 333  | 585   | 1.51  | 167.77  | 164  | 29 | 4.62E-02 | 12.9 | 2.26E+00 |
| 6  | 7  | 87.15*   | 727  | 544   | 1.16  | 173.85  | 164  | 29 | 1.01E-01 | 6.5  |          |
| 7  | 7  | 89.84    | 473  | 429   | 1.06  | 179.23  | 164  | 29 | 6.57E-02 | 8.4  |          |
| 8  | 7  | 92.70*   | 595  | 461   | 1.18  | 184.96  | 164  | 29 | 8.27E-02 | 8.0  |          |
| 9  | 0  | 105.61   | 90   | 566   | 0.94  | 210.76  | 207  | 9  | 1.24E-02 | 49.0 |          |
| 10 | 0  | 128.76*  | 126  | 490   | 1.17  | 257.08  | 254  | 8  | 1.74E-02 | 32.1 |          |
| 11 | 0  | 185.89*  | 442  | 470   | 1.12  | 371.32  | 366  | 11 | 6.14E-02 | 10.9 |          |
| 12 | 0  | 209.19*  | 227  | 390   | 0.96  | 417.92  | 414  | 10 | 3.15E-02 | 17.7 |          |
| 13 | 6  | 238.57*  | 2170 | 200   | 0.97  | 476.67  | 470  | 19 | 3.01E-01 | 2.4  | 2.59E+00 |
| 14 | 6  | 241.55*  | 617  | 299   | 1.72  | 482.64  | 470  | 19 | 8.57E-02 | 8.9  |          |
| 15 | 0  | 270.06   | 202  | 316   | 1.21  | 539.65  | 534  | 12 | 2.80E-02 | 19.0 |          |
| 16 | 0  | 277.28   | 65   | 298   | 0.91  | 554.09  | 550  | 9  | 9.04E-03 | 49.5 |          |
| 17 | 0  | 295.15*  | 735  | 268   | 1.08  | 589.82  | 584  | 12 | 1.02E-01 | 5.8  |          |
| 18 | 0  | 300.01   | 151  | 203   | 1.18  | 599.53  | 596  | 9  | 2.10E-02 | 18.8 |          |
| 19 | 0  | 327.70   | 90   | 194   | 1.21  | 654.92  | 651  | 9  | 1.24E-02 | 29.9 |          |
| 20 | 0  | 338.09   | 430  | 293   | 1.00  | 675.70  | 670  | 12 | 5.98E-02 | 9.3  |          |
| 21 | 0  | 351.80*  | 1214 | 264   | 1.16  | 703.12  | 698  | 12 | 1.69E-01 | 3.9  |          |
| 22 | 0  | 463.11   | 149  | 168   | 1.32  | 925.73  | 920  | 13 | 2.06E-02 | 19.8 |          |
| 23 | 0  | 510.68*  | 181  | 240   | 1.89  | 1020.85 | 1013 | 19 | 2.52E-02 | 23.1 |          |
| 24 | 0  | 583.07*  | 598  | 181   | 1.38  | 1165.63 | 1159 | 15 | 8.30E-02 | 6.5  |          |
| 25 | 0  | 609.14*  | 822  | 156   | 1.36  | 1217.77 | 1211 | 15 | 1.14E-01 | 4.8  |          |
| 26 | 0  | 727.19   | 139  | 130   | 1.63  | 1453.86 | 1447 | 13 | 1.93E-02 | 18.9 |          |
| 27 | 0  | 767.82   | 54   | 112   | 0.79  | 1535.13 | 1534 | 8  | 7.44E-03 | 36.7 |          |
| 28 | 0  | 794.84   | 70   | 86    | 1.51  | 1589.16 | 1584 | 11 | 9.78E-03 | 28.3 |          |
| 29 | 0  | 860.68   | 57   | 58    | 0.79  | 1720.84 | 1718 | 7  | 7.97E-03 | 24.7 |          |
| 30 | 0  | 910.90*  | 432  | 49    | 1.41  | 1821.29 | 1814 | 15 | 6.00E-02 | 6.0  |          |
| 31 | 0  | 935.13   | 96   | 66    | 1.86  | 1869.75 | 1860 | 20 | 1.33E-02 | 23.7 |          |
| 32 | 0  | 968.39   | 251  | 133   | 1.60  | 1936.27 | 1927 | 16 | 3.49E-02 | 12.0 |          |
| 33 | 0  | 1120.46* | 148  | 140   | 1.93  | 2240.41 | 2232 | 20 | 2.05E-02 | 21.4 |          |
| 34 | 0  | 1213.98  | 40   | 83    | 3.08  | 2427.46 | 2420 | 13 | 5.61E-03 | 49.4 |          |
| 35 | 0  | 1377.09  | 66   | 16    | 2.09  | 2753.70 | 2745 | 16 | 9.17E-03 | 18.3 |          |
| 36 | 0  | 1383.20  | 38   | 7     | 4.09  | 2765.91 | 2760 | 14 | 5.28E-03 | 21.9 |          |
| 37 | 0  | 1417.27  | 103  | 36    | 15.34 | 2834.06 | 2811 | 49 | 1.43E-02 | 23.5 |          |
| 38 | 0  | 1460.52* | 1653 | 24    | 2.11  | 2920.57 | 2911 | 17 | 2.30E-01 | 2.6  |          |

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit |
|----|----|----------|------|-------|------|---------|------|----|----------|------|-----|
| 39 | 0  | 1729.04  | 37   | 7     | 0.93 | 3457.66 | 3451 | 13 | 5.07E-03 | 21.9 |     |
| 40 | 0  | 1764.44* | 140  | 8     | 1.37 | 3528.47 | 3520 | 16 | 1.94E-02 | 9.9  |     |
| 41 | 0  | 1846.36  | 45   | 0     | 1.95 | 3692.31 | 3684 | 16 | 6.25E-03 | 14.9 |     |

Flag: "\*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964002.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8
Sample title      : MXR1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 21:17:36
Sample ID        : G247964002 Sample quantity : 134.67 GRAM
Sample type      : SOLID Sample geometry :
Detector name    : GAMMA25 Detector geometry: CAN
Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:02.50 0.0%
Peak Width (FWHM): 3.00 Confidence level : 5.00 %
Energy tolerance : 1.50 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00 WTM error limit : 3.00

```

## Full Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| K-40    | +         | 1460.82      | *   | 3.900E+01           | 3.874E+00 | 4.668E-01      | 3.975E-02 | 83.549  |
| CD-109  | +         | 88.03        | *   | 5.997E+00           | 1.006E+00 | 7.340E-01      | 7.888E-02 | 8.170   |
| SN-126  | +         | 64.28        |     | 1.007E+00           | 4.033E-01 | 3.158E-01      | 5.032E-02 | 3.189   |
|         | +         | 86.94        |     | 2.421E+00           | 1.060E+00 | 2.949E-01      | 1.234E-01 | 8.210   |
|         | +         | 87.57        | *   | 5.825E-01           | 9.774E-02 | 7.114E-02      | 7.629E-03 | 8.187   |
| EU-155  | +         | 86.55        |     | 7.074E-01           | 1.190E-01 | 8.602E-02      | 9.241E-03 | 8.224   |
|         | +         | 105.31       | *   | 1.351E-01           | 1.334E-01 | 1.311E-01      | 1.550E-02 | 1.030   |
| TL-208  | +         | 277.37       |     | 5.800E-01           | 5.798E-01 | 6.141E-01      | 8.826E-02 | 0.944   |
|         | +         | 583.19       | *   | 7.850E-01           | 1.350E-01 | 6.666E-02      | 7.509E-03 | 11.775  |
|         | +         | 860.56       |     | 7.249E-01           | 3.660E-01 | 5.057E-01      | 5.284E-02 | 1.433   |
| PB-210  | +         | 46.54        | *   | 1.656E+00           | 7.116E-01 | 6.289E-01      | 6.441E-02 | 2.633   |
| BI-211  |           | 72.87        |     | 4.124E+00           | 1.955E+00 | 2.989E+00      | 3.017E-01 | 1.380   |
|         | +         | 351.06       | *   | 6.736E+00           | 8.856E-01 | 3.185E-01      | 3.356E-02 | 21.151  |
| PB-212  | +         | 74.82        |     | 3.569E+00           | 5.904E-01 | 3.153E-01      | 4.435E-02 | 11.318  |
|         | +         | 77.11        |     | 3.396E+00           | 3.990E-01 | 1.911E-01      | 1.958E-02 | 17.775  |
|         | +         | 238.63       | *   | 2.598E+00           | 3.222E-01 | 8.365E-02      | 9.557E-03 | 31.055  |
|         | +         | 300.09       |     | 2.872E+00           | 1.137E+00 | 1.222E+00      | 1.534E-01 | 2.350   |
| BI-214  | +         | 609.32       | *   | 2.099E+00           | 3.252E-01 | 1.184E-01      | 1.434E-02 | 17.725  |
|         | +         | 1120.29      |     | 1.972E+00           | 8.699E-01 | 5.966E-01      | 6.504E-02 | 3.305   |
|         | +         | 1764.49      |     | 2.706E+00           | 5.793E-01 | 2.814E-01      | 2.319E-02 | 9.614   |
| PB-214  | +         | 74.82        |     | 6.325E+00           | 9.840E-01 | 5.588E-01      | 7.204E-02 | 11.318  |
|         | +         | 77.11        |     | 5.988E+00           | 8.595E-01 | 3.369E-01      | 4.431E-02 | 17.775  |
|         | +         | 242.00       |     | 4.484E+00           | 9.633E-01 | 5.097E-01      | 6.125E-02 | 8.796   |
|         | +         | 295.22       |     | 2.468E+00           | 4.277E-01 | 2.040E-01      | 2.614E-02 | 12.101  |
|         | +         | 351.93       | *   | 2.445E+00           | 3.486E-01 | 1.159E-01      | 1.376E-02 | 21.098  |
| RA-224  | +         | 240.99       | *   | 7.928E+00           | 1.640E+00 | 8.978E-01      | 9.434E-02 | 8.831   |
| RA-226  | +         | 609.32       | *   | 2.099E+00           | 3.252E-01 | 1.184E-01      | 1.434E-02 | 17.725  |
|         | +         | 1120.29      |     | 1.972E+00           | 8.699E-01 | 5.966E-01      | 6.504E-02 | 3.305   |
|         | +         | 1764.49      |     | 2.706E+00           | 5.793E-01 | 2.814E-01      | 2.319E-02 | 9.614   |
| AC-228  | +         | 338.32       |     | 2.647E+00           | 1.219E+00 | 3.495E-01      | 1.472E-01 | 7.575   |
|         | +         | 911.20       | *   | 2.781E+00           | 4.773E-01 | 2.278E-01      | 2.784E-02 | 12.210  |
|         | +         | 968.97       |     | 2.789E+00           | 9.594E-01 | 4.589E-01      | 1.130E-01 | 6.077   |
| RA-228  | +         | 338.32       |     | 2.647E+00           | 1.219E+00 | 3.495E-01      | 1.472E-01 | 7.575   |
|         | +         | 911.20       | *   | 2.781E+00           | 4.773E-01 | 2.278E-01      | 2.784E-02 | 12.210  |

Sample ID : G247964002

Acquisition date : 10-MAR-2010 21:17:36

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TH-228  | +         | 968.97       |     | 2.789E+00           | 9.594E-01 | 4.589E-01      | 1.130E-01 | 6.077   |
|         | +         | 74.82        |     | 3.569E+00           | 4.794E-01 | 3.153E-01      | 3.225E-02 | 11.318  |
|         | +         | 77.11        |     | 3.396E+00           | 3.990E-01 | 1.911E-01      | 1.958E-02 | 17.775  |
|         | +         | 238.63       | *   | 2.598E+00           | 3.222E-01 | 8.365E-02      | 9.557E-03 | 31.055  |
| TH-229  | +         | 300.09       |     | 2.872E+00           | 2.072E+00 | 1.222E+00      | 7.527E-01 | 2.350   |
|         | +         | 85.43        |     | 6.654E-01           | 1.855E-01 | 1.774E-01      | 1.883E-02 | 3.751   |
|         | +         | 88.47        |     | 8.980E-01           | 1.507E-01 | 1.101E-01      | 1.186E-02 | 8.154   |
|         |           | 193.51       | *   | -3.151E-01          | 5.156E-01 | 8.195E-01      | 7.815E-02 | -0.384  |
| TH-232  |           | 210.85       |     | 2.139E+00           | 9.577E-01 | 1.513E+00      | 1.499E-01 | 1.414   |
|         | +         | 338.32       |     | 2.647E+00           | 5.638E-01 | 3.495E-01      | 3.643E-02 | 7.575   |
|         | +         | 911.20       | *   | 2.781E+00           | 4.773E-01 | 2.278E-01      | 2.784E-02 | 12.210  |
|         | +         | 968.97       |     | 2.789E+00           | 9.594E-01 | 4.589E-01      | 1.130E-01 | 6.077   |
| TH-234  | +         | 63.29        | *   | 2.613E+00           | 1.081E+00 | 8.182E-01      | 1.553E-01 | 3.194   |
|         | +         | 92.59        |     | 4.245E+00           | 1.193E+00 | 6.404E-01      | 1.480E-01 | 6.628   |
| U-235   | +         | 89.96        |     | 4.073E+00           | 1.245E+00 | 7.669E-01      | 1.954E-01 | 5.312   |
|         | +         | 93.35        |     | 3.206E+00           | 9.268E-01 | 4.855E-01      | 1.170E-01 | 6.604   |
|         |           | 143.76       | *   | 1.435E-01           | 1.864E-01 | 3.124E-01      | 5.739E-02 | 0.459   |
|         |           | 163.33       |     | 1.815E-02           | 4.053E-01 | 6.600E-01      | 1.204E-01 | 0.028   |
| NP-237  | +         | 185.72       |     | 3.359E-01           | 7.963E-02 | 6.186E-02      | 5.792E-03 | 5.430   |
|         |           | 205.31       |     | -3.402E-02          | 5.096E-01 | 7.342E-01      | 1.375E-01 | -0.046  |
|         | +         | 86.48        | *   | 1.738E+00           | 4.667E-01 | 2.113E-01      | 4.970E-02 | 8.227   |
|         |           | 95.86        |     | -2.370E-01          | 6.568E-01 | 9.944E-01      | 2.488E-01 | -0.238  |
| U-238   | +         | 63.29        | *   | 2.613E+00           | 1.081E+00 | 8.182E-01      | 1.553E-01 | 3.194   |
|         | +         | 92.59        |     | 4.245E+00           | 8.236E-01 | 6.404E-01      | 7.036E-02 | 6.628   |
| ANH-511 | +         | 511.00       | *   | 1.800E-01           | 8.525E-02 | 4.661E-02      | 4.797E-03 | 3.862   |

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| BE-7    |           | 477.60       | *   | 3.059E-02           | 3.782E-01 | 6.193E-01           | 6.555E-02 | 0.049   |
| NA-22   |           | 1274.54      | *   | -1.881E-03          | 5.269E-02 | 8.635E-02           | 7.081E-03 | -0.022  |
| NA-24   |           | 1368.63      | *   | -1.631E+01          | 5.269E-02 | Half-Life too short |           |         |
| SC-46   |           | 889.28       | *   | -3.808E-02          | 4.631E-02 | 6.956E-02           | 6.661E-03 | -0.547  |
| V-48    | +         | 1120.55      |     | 3.456E-01           | 1.507E-01 | 1.623E-01           | 1.395E-02 | 2.129   |
|         |           | 944.13       |     | 3.337E-02           | 1.349E+00 | 1.980E+00           | 1.858E-01 | 0.017   |
|         |           | 983.53       | *   | -2.830E-02          | 1.046E-01 | 1.645E-01           | 1.525E-02 | -0.172  |
|         |           | 1312.11      |     | 4.958E-02           | 1.132E-01 | 1.931E-01           | 1.574E-02 | 0.257   |
| CR-51   |           | 320.08       | *   | 1.225E-01           | 3.852E-01 | 6.592E-01           | 7.316E-02 | 0.186   |
| MN-54   |           | 834.85       | *   | 1.549E-02           | 4.526E-02 | 7.585E-02           | 7.697E-03 | 0.204   |
| CO-56   |           | 846.77       | *   | 2.031E-02           | 4.249E-02 | 7.229E-02           | 7.253E-03 | 0.281   |
|         |           | 1037.84      |     | 1.053E-01           | 3.608E-01 | 6.187E-01           | 5.866E-02 | 0.170   |
|         |           | 1238.28      |     | 1.860E-01           | 1.217E-01 | 2.176E-01           | 1.845E-02 | 0.855   |
|         |           | 1771.35      |     | -9.013E-02          | 2.707E-01 | 3.468E-01           | 2.855E-02 | -0.260  |
| CO-57   |           | 122.06       | *   | 8.740E-03           | 2.056E-02 | 3.517E-02           | 4.536E-03 | 0.248   |
|         |           | 136.47       |     | 3.028E-02           | 1.834E-01 | 3.088E-01           | 3.784E-02 | 0.098   |
| CO-58   |           | 810.76       | *   | -4.871E-03          | 4.442E-02 | 7.225E-02           | 7.496E-03 | -0.067  |
| FE-59   |           | 1099.45      | *   | -2.681E-03          | 1.257E-01 | 2.094E-01           | 1.972E-02 | -0.013  |
|         |           | 1291.59      |     | 5.540E-02           | 1.644E-01 | 2.776E-01           | 2.608E-02 | 0.200   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| CO-60   | 1173.23   |              |     | -5.220E-02          | 5.676E-02 | 8.739E-02      | 7.193E-03 | -0.597  |
|         | 1332.49   | *            |     | -1.280E-02          | 5.287E-02 | 8.469E-02      | 6.878E-03 | -0.151  |
| ZN-65   | 1115.54   | *            |     | 5.739E-03           | 1.287E-01 | 1.855E-01      | 1.602E-02 | 0.031   |
| SE-75   | 121.12    |              |     | 4.938E-02           | 1.100E-01 | 1.882E-01      | 2.746E-02 | 0.262   |
|         | 136.00    |              |     | -2.812E-03          | 3.562E-02 | 5.949E-02      | 7.059E-03 | -0.047  |
|         | 264.66    | *            |     | 4.528E-02           | 4.818E-02 | 7.255E-02      | 7.952E-03 | 0.624   |
|         | 279.54    |              |     | -3.370E-02          | 1.330E-01 | 1.838E-01      | 2.098E-02 | -0.183  |
|         | 400.66    |              |     | 5.783E-02           | 2.797E-01 | 4.678E-01      | 5.399E-02 | 0.124   |
| SR-85   | 514.00    | *            |     | 6.248E-02           | 4.721E-02 | 7.392E-02      | 7.627E-03 | 0.845   |
| Y-88    | 898.04    |              |     | -6.319E-03          | 5.084E-02 | 8.178E-02      | 7.778E-03 | -0.077  |
|         | 1836.06   | *            |     | 3.816E-02           | 3.728E-02 | 7.006E-02      | 5.726E-03 | 0.545   |
| Y-91    | 1204.77   | *            |     | -9.366E+00          | 2.985E+01 | 4.585E+01      | 3.773E+00 | -0.204  |
| NB-94   | 702.65    | *            |     | 2.249E-02           | 3.826E-02 | 6.594E-02      | 7.240E-03 | 0.341   |
|         | 871.09    |              |     | 1.124E-02           | 3.944E-02 | 6.579E-02      | 6.435E-03 | 0.171   |
| NB-95   | 765.81    | *            |     | 7.458E-02           | 6.174E-02 | 9.713E-02      | 1.038E-02 | 0.768   |
| NB-95M  | 235.69    | *            |     | 1.995E-03           | 1.353E-01 | 1.939E-01      | 2.226E-02 | 0.010   |
| ZR-95   | 724.19    |              |     | 1.595E-02           | 1.365E-01 | 1.986E-01      | 2.281E-02 | 0.080   |
|         | 756.73    | *            |     | 7.805E-03           | 8.830E-02 | 1.468E-01      | 1.684E-02 | 0.053   |
| MO-99   | 140.51    |              |     | -6.658E+00          | 5.566E+01 | 9.258E+01      | 2.306E+01 | -0.072  |
|         | 181.07    |              |     | 4.799E+01           | 5.197E+01 | 7.896E+01      | 1.507E+01 | 0.608   |
|         | 366.42    |              |     | 6.966E+01           | 2.903E+02 | 4.900E+02      | 4.803E+01 | 0.142   |
|         | 739.50    | *            |     | 6.183E+00           | 3.793E+01 | 6.357E+01      | 1.085E+01 | 0.097   |
|         | 777.92    |              |     | -7.962E+01          | 1.177E+02 | 1.831E+02      | 1.942E+01 | -0.435  |
| TC-99M  | 140.51    | *            |     | -5.201E+14          | 1.177E+02 | Half-Life      | too short |         |
| RU-103  | 497.08    | *            |     | 2.151E-02           | 4.562E-02 | 7.625E-02      | 1.142E-02 | 0.282   |
| +       | 610.33    |              |     | 2.336E+01           | 4.701E+00 | 3.978E+00      | 7.024E-01 | 5.872   |
| RH-106  | 621.93    | *            |     | -6.038E-02          | 3.215E-01 | 5.332E-01      | 7.933E-02 | -0.113  |
|         | 1050.41   |              |     | 8.140E-01           | 2.813E+00 | 4.822E+00      | 4.335E-01 | 0.169   |
| RU-106  | 621.93    | *            |     | -6.038E-02          | 3.214E-01 | 5.332E-01      | 5.839E-02 | -0.113  |
|         | 1050.41   |              |     | 8.140E-01           | 2.813E+00 | 4.822E+00      | 4.335E-01 | 0.169   |
| AG-108M | 433.94    | *            |     | 6.414E-03           | 2.978E-02 | 4.959E-02      | 4.872E-03 | 0.129   |
|         | 614.28    |              |     | 3.402E-02           | 4.170E-02 | 6.547E-02      | 7.296E-03 | 0.520   |
|         | 722.91    |              |     | -6.924E-03          | 4.985E-02 | 7.082E-02      | 7.879E-03 | -0.098  |
| AG-110M | 657.76    | *            |     | -9.674E-02          | 4.519E-02 | 6.310E-02      | 7.111E-03 | -1.533  |
|         | 677.62    |              |     | -2.463E-01          | 3.484E-01 | 5.429E-01      | 6.104E-02 | -0.454  |
|         | 706.68    |              |     | -9.003E-02          | 2.394E-01 | 3.873E-01      | 4.324E-02 | -0.232  |
|         | 763.94    |              |     | 1.333E-01           | 2.025E-01 | 3.089E-01      | 3.362E-02 | 0.432   |
|         | 884.68    |              |     | 6.915E-02           | 5.803E-02 | 1.029E-01      | 1.016E-02 | 0.672   |
|         | 937.49    |              |     | -4.676E-02          | 1.479E-01 | 1.980E-01      | 1.917E-02 | -0.236  |
| +       | 1384.29   |              |     | 3.862E-01           | 1.726E-01 | 3.029E-01      | 2.554E-02 | 1.275   |
|         | 1505.03   |              |     | -5.173E-01          | 3.616E-01 | 4.701E-01      | 3.897E-02 | -1.100  |
| SN-113  | 391.69    | *            |     | 7.396E-03           | 4.598E-02 | 7.691E-02      | 7.183E-03 | 0.096   |
| CD-115  | 260.90    |              |     | -3.606E-04          | 4.598E-02 | Half-Life      | too short |         |
|         | 492.35    |              |     | -8.075E-05          | 4.598E-02 | Half-Life      | too short |         |
|         | 527.90    | *            |     | -2.236E-05          | 4.598E-02 | Half-Life      | too short |         |
| SN-117M | 156.02    |              |     | -1.841E+00          | 2.584E+00 | 4.162E+00      | 4.151E-01 | -0.442  |
|         | 158.56    | *            |     | -2.999E-04          | 6.252E-02 | 1.036E-01      | 1.006E-02 | -0.003  |
| TE-123M | 159.00    | *            |     | -1.126E-02          | 2.690E-02 | 4.383E-02      | 4.256E-03 | -0.257  |
| SB-124  | 602.73    |              |     | -1.102E-03          | 4.554E-02 | 6.678E-02      | 7.259E-03 | -0.016  |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| SB-125  |           | 645.85       |     | -2.050E-01          | 5.834E-01 | 9.543E-01      | 1.090E-01 | -0.215  |
|         |           | 722.78       |     | -6.902E-02          | 5.262E-01 | 7.482E-01      | 8.277E-02 | -0.092  |
|         |           | 1690.97      | *   | -5.758E-02          | 8.737E-02 | 1.281E-01      | 1.110E-02 | -0.450  |
|         |           | 427.87       | *   | 8.005E-02           | 9.143E-02 | 1.580E-01      | 1.525E-02 | 0.507   |
|         | +         | 463.37       |     | 1.299E+00           | 5.319E-01 | 6.284E-01      | 6.564E-02 | 2.067   |
|         |           | 600.60       |     | 6.691E-02           | 1.819E-01 | 3.138E-01      | 3.568E-02 | 0.213   |
| TE-125M |           | 635.95       |     | 8.700E-02           | 3.012E-01 | 5.147E-01      | 5.950E-02 | 0.169   |
|         |           | 109.28       | *   | 4.249E+00           | 8.562E+00 | 1.326E+01      | 1.778E+00 | 0.320   |
| I-126   |           | 388.63       |     | -3.429E-04          | 2.151E-01 | 3.568E-01      | 3.276E-02 | -0.001  |
|         |           | 666.33       | *   | -3.296E-01          | 3.456E-01 | 5.410E-01      | 5.989E-02 | -0.609  |
| SB-126  |           | 753.82       |     | 1.845E+00           | 2.688E+00 | 4.639E+00      | 4.988E-01 | 0.398   |
|         |           | 414.70       |     | -4.640E-02          | 1.040E-01 | 1.670E-01      | 1.563E-02 | -0.278  |
|         |           | 666.50       |     | -4.247E-02          | 1.148E-01 | 1.873E-01      | 2.074E-02 | -0.227  |
|         |           | 695.00       |     | -4.465E-02          | 1.088E-01 | 1.758E-01      | 1.935E-02 | -0.254  |
|         |           | 697.00       |     | -3.786E-01          | 3.786E-01 | 5.820E-01      | 6.401E-02 | -0.650  |
|         |           | 720.70       | *   | 5.804E-02           | 2.475E-01 | 3.645E-01      | 3.978E-02 | 0.159   |
| SB-127  |           | 856.80       |     | 2.672E-01           | 7.624E-01 | 1.120E+00      | 1.112E-01 | 0.239   |
|         |           | 252.40       |     | 4.227E-01           | 8.542E+00 | 1.369E+01      | 5.804E+00 | 0.031   |
|         |           | 473.00       |     | -1.959E+00          | 3.831E+00 | 6.020E+00      | 8.936E-01 | -0.325  |
|         |           | 685.70       | *   | 2.843E-01           | 3.254E+00 | 5.457E+00      | 7.888E-01 | 0.052   |
|         |           | 783.70       |     | 1.218E+01           | 8.698E+00 | 1.543E+01      | 2.300E+00 | 0.789   |
|         |           | 80.19        |     | -5.154E+00          | 4.591E+00 | 6.241E+00      | 6.522E-01 | -0.826  |
| I-131   |           | 284.31       |     | -1.826E+00          | 2.219E+00 | 3.332E+00      | 3.831E-01 | -0.548  |
|         |           | 364.49       | *   | 4.500E-02           | 1.653E-01 | 2.797E-01      | 2.878E-02 | 0.161   |
| TE-132  |           | 636.99       |     | -1.040E+00          | 2.512E+00 | 4.094E+00      | 4.677E-01 | -0.254  |
|         |           | 49.72        |     | 2.955E+00           | 7.851E+00 | 1.188E+01      | 1.538E+00 | 0.249   |
|         |           | 111.76       |     | -7.104E+01          | 6.831E+01 | 1.078E+02      | 1.617E+01 | -0.659  |
|         |           | 116.30       |     | -6.357E+00          | 5.694E+01 | 9.597E+01      | 1.464E+01 | -0.066  |
| BA-133  |           | 228.16       | *   | 1.043E-01           | 1.817E+00 | 2.937E+00      | 5.182E-01 | 0.036   |
|         |           | 81.00        |     | -1.026E-01          | 6.743E-02 | 8.731E-02      | 1.447E-02 | -1.176  |
|         | +         | 276.40       |     | 5.365E-01           | 5.374E-01 | 6.527E-01      | 1.029E-01 | 0.822   |
|         |           | 302.85       |     | 1.474E-02           | 1.459E-01 | 2.195E-01      | 3.229E-02 | 0.067   |
|         |           | 356.01       | *   | 2.225E-02           | 4.744E-02 | 7.202E-02      | 1.005E-02 | 0.309   |
|         |           | 383.85       |     | -9.517E-02          | 3.071E-01 | 5.010E-01      | 6.474E-02 | -0.190  |
| I-133   |           | 529.87       | *   | 4.439E-02           | 3.071E-01 | Half-Life      | too short |         |
|         |           | 875.33       |     | -3.416E+00          | 3.071E-01 | Half-Life      | too short |         |
| CS-134  |           | 1298.22      |     | 3.820E+00           | 3.071E-01 | Half-Life      | too short |         |
|         |           | 563.25       |     | 2.679E-01           | 4.080E-01 | 6.831E-01      | 7.326E-02 | 0.392   |
|         |           | 569.33       |     | -1.563E-02          | 2.267E-01 | 3.595E-01      | 3.879E-02 | -0.043  |
|         |           | 604.72       |     | -1.536E-02          | 3.841E-02 | 5.422E-02      | 5.907E-03 | -0.283  |
|         | +         | 795.86       | *   | 1.372E-01           | 7.904E-02 | 1.084E-01      | 1.141E-02 | 1.266   |
|         |           | 801.95       |     | -1.935E-01          | 4.639E-01 | 6.893E-01      | 7.216E-02 | -0.281  |
| CS-135  |           | 1365.19      |     | 4.835E-02           | 1.501E+00 | 2.459E+00      | 2.111E-01 | 0.020   |
|         |           | 268.22       | *   | 2.123E-01           | 1.751E-01 | 2.651E-01      | 3.200E-02 | 0.801   |
| I-135   |           | 546.56       |     | 8.916E+13           | 1.751E-01 | Half-Life      | too short |         |
|         |           | 836.80       |     | 8.045E+14           | 1.751E-01 | Half-Life      | too short |         |
|         |           | 1038.76      |     | 7.268E+14           | 1.751E-01 | Half-Life      | too short |         |
|         |           | 1131.51      |     | -2.209E+14          | 1.751E-01 | Half-Life      | too short |         |
|         |           | 1260.41      | *   | 1.773E+14           | 1.751E-01 | Half-Life      | too short |         |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| CS-136  |           | 1457.56      |     | 5.885E+16           | 1.751E-01 | Half-Life      | too short |         |
|         |           | 1678.03      |     | 3.537E+14           | 1.751E-01 | Half-Life      | too short |         |
|         |           | 1791.20      |     | -1.492E+14          | 1.751E-01 | Half-Life      | too short |         |
|         |           | 153.25       |     | 4.425E-01           | 9.862E-01 | 1.663E+00      | 1.941E-01 | 0.266   |
|         |           | 176.60       |     | -1.510E-01          | 5.842E-01 | 9.503E-01      | 9.506E-02 | -0.159  |
|         |           | 273.65       |     | 2.213E-01           | 8.893E-01 | 1.009E+00      | 1.176E-01 | 0.219   |
|         |           | 340.55       |     | 3.490E-01           | 2.126E-01 | 3.412E-01      | 3.636E-02 | 1.023   |
|         |           | 818.51       |     | 9.327E-02           | 1.009E-01 | 1.772E-01      | 1.826E-02 | 0.526   |
| BA-137M |           | 1048.07      | *   | -3.307E-02          | 1.442E-01 | 2.369E-01      | 2.216E-02 | -0.140  |
|         |           | 1235.36      |     | 5.304E-01           | 9.410E-01 | 1.603E+00      | 1.840E-01 | 0.331   |
|         |           | 661.66       | *   | 3.975E-03           | 4.597E-02 | 7.990E-02      | 8.850E-03 | 0.050   |
|         |           | 661.66       | *   | 4.199E-03           | 4.857E-02 | 8.440E-02      | 9.361E-03 | 0.050   |
| CE-139  |           | 165.86       | *   | -2.209E-02          | 2.678E-02 | 4.261E-02      | 3.799E-03 | -0.518  |
| BA-140  |           | 162.66       |     | 1.021E+00           | 9.505E-01 | 1.601E+00      | 1.571E-01 | 0.638   |
|         |           | 304.85       |     | 4.486E-01           | 1.828E+00 | 2.744E+00      | 8.242E-01 | 0.163   |
|         |           | 423.72       |     | -2.486E+00          | 2.678E+00 | 3.943E+00      | 1.306E+00 | -0.631  |
|         |           | 537.26       | *   | -2.824E-02          | 3.885E-01 | 6.229E-01      | 2.145E-01 | -0.045  |
| LA-140  | +         | 328.76       |     | 8.561E-01           | 5.214E-01 | 6.978E-01      | 7.676E-02 | 1.227   |
|         |           | 487.02       |     | 2.627E-01           | 1.932E-01 | 3.378E-01      | 3.564E-02 | 0.778   |
|         |           | 815.77       |     | -6.341E-02          | 4.472E-01 | 7.248E-01      | 8.099E-02 | -0.087  |
|         |           | 1596.21      | *   | -8.546E-02          | 1.090E-01 | 1.602E-01      | 1.332E-02 | -0.533  |
| CE-141  |           | 145.44       | *   | -2.813E-02          | 6.201E-02 | 1.016E-01      | 1.130E-02 | -0.277  |
| CE-143  |           | 57.36        |     | 2.049E-03           | 6.201E-02 | Half-Life      | too short |         |
|         |           | 293.27       | *   | 7.318E-03           | 6.201E-02 | Half-Life      | too short |         |
|         |           | 664.57       |     | -1.067E-02          | 6.201E-02 | Half-Life      | too short |         |
|         |           | 721.93       |     | 5.070E-04           | 6.201E-02 | Half-Life      | too short |         |
| CE-144  |           | 80.12        |     | -1.979E+00          | 1.732E+00 | 2.352E+00      | 2.439E-01 | -0.841  |
|         |           | 133.52       | *   | -3.734E-02          | 1.825E-01 | 2.898E-01      | 5.052E-02 | -0.129  |
| PM-144  |           | 476.78       |     | 4.846E-03           | 7.157E-02 | 1.171E-01      | 1.247E-02 | 0.041   |
|         |           | 618.01       |     | 5.419E-03           | 3.339E-02 | 5.679E-02      | 6.319E-03 | 0.095   |
|         |           | 696.49       | *   | -6.710E-03          | 3.778E-02 | 6.211E-02      | 6.835E-03 | -0.108  |
| PR-144  |           | 696.51       | *   | -5.360E-01          | 2.831E+00 | 4.651E+00      | 5.116E-01 | -0.115  |
|         |           | 1489.16      |     | 3.279E+00           | 1.378E+01 | 2.307E+01      | 1.910E+00 | 0.142   |
| PM-146  |           | 453.88       | *   | 4.777E-02           | 4.608E-02 | 7.955E-02      | 9.192E-03 | 0.601   |
|         |           | 633.25       |     | 8.022E-02           | 1.564E+00 | 2.635E+00      | 1.022E+00 | 0.030   |
|         |           | 735.93       |     | 1.489E-02           | 1.570E-01 | 2.618E-01      | 7.538E-02 | 0.057   |
| ND-147  |           | 747.24       |     | 1.185E-01           | 1.143E-01 | 2.000E-01      | 3.192E-02 | 0.593   |
|         | +         | 91.11        |     | 1.727E+00           | 3.521E-01 | 4.702E-01      | 5.400E-02 | 3.673   |
|         |           | 319.41       |     | -1.679E+00          | 4.185E+00 | 6.905E+00      | 7.420E-01 | -0.243  |
|         |           | 531.02       | *   | 3.055E-01           | 7.851E-01 | 1.300E+00      | 2.089E-01 | 0.235   |
| PM-149  |           | 285.90       | *   | 7.891E-05           | 7.851E-01 | Half-Life      | too short |         |
| EU-152  |           | 121.78       |     | 3.649E-02           | 5.845E-02 | 1.005E-01      | 1.383E-02 | 0.363   |
|         |           | 244.70       |     | -1.647E-02          | 3.323E-01 | 4.723E-01      | 4.996E-02 | -0.035  |
|         |           | 344.28       | *   | 6.032E-03           | 1.024E-01 | 1.598E-01      | 1.716E-02 | 0.038   |
|         |           | 778.90       |     | -9.808E-02          | 2.786E-01 | 4.457E-01      | 4.723E-02 | -0.220  |
|         |           | 964.08       |     | 4.126E-01           | 4.017E-01 | 6.148E-01      | 5.735E-02 | 0.671   |
|         |           | 1085.87      |     | -6.984E-01          | 4.562E-01 | 6.564E-01      | 5.779E-02 | -1.064  |
|         |           | 1112.07      |     | 1.581E-01           | 4.143E-01 | 6.418E-01      | 5.552E-02 | 0.246   |
|         |           | 1408.01      |     | -4.277E-02          | 2.596E-01 | 3.521E-01      | 2.893E-02 | -0.121  |



----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Activity Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|--------------|---------------------|-----------|----------------|-----------|---------|
| GD-153  |           | 69.67        |              | -5.458E-01          | 9.900E-01 | 1.406E+00      | 1.405E-01 | -0.388  |
|         |           | 97.43        | *            | -6.456E-02          | 6.750E-02 | 9.815E-02      | 1.105E-02 | -0.658  |
|         |           | 103.18       |              | -4.225E-02          | 8.687E-02 | 1.302E-01      | 1.512E-02 | -0.324  |
| EU-154  |           | 123.07       |              | -3.033E-02          | 4.240E-02 | 6.924E-02      | 1.025E-02 | -0.438  |
|         |           | 723.31       |              | -3.168E-02          | 2.312E-01 | 3.286E-01      | 3.813E-02 | -0.096  |
|         |           | 873.19       |              | 2.023E-01           | 3.192E-01 | 5.461E-01      | 6.960E-02 | 0.370   |
|         |           | 996.26       |              | -2.193E-01          | 4.596E-01 | 7.074E-01      | 1.257E-01 | -0.310  |
|         |           | 1004.73      |              | -2.529E-01          | 2.875E-01 | 3.996E-01      | 4.821E-02 | -0.633  |
| TB-160  | +         | 1274.44      | *            | -4.264E-02          | 1.524E-01 | 2.445E-01      | 2.703E-02 | -0.174  |
|         |           | 86.79        |              | 1.952E+00           | 3.276E-01 | 4.092E-01      | 4.372E-02 | 4.770   |
|         |           | 197.04       |              | 3.881E-01           | 5.630E-01 | 9.416E-01      | 9.053E-02 | 0.412   |
|         |           | 215.65       |              | 4.701E-01           | 7.339E-01 | 1.220E+00      | 1.221E-01 | 0.385   |
|         |           | 298.57       |              | 4.213E-01           | 1.648E-01 | 2.146E-01      | 2.361E-02 | 1.963   |
|         | +         | 879.36       | *            | -7.404E-02          | 1.668E-01 | 2.609E-01      | 2.528E-02 | -0.284  |
|         |           | 962.29       |              | 5.337E-01           | 7.438E-01 | 1.113E+00      | 1.039E-01 | 0.479   |
|         |           | 966.15       |              | 1.633E+00           | 3.693E-01 | 6.454E-01      | 6.016E-02 | 2.531   |
|         |           | 1177.93      |              | 3.294E-01           | 4.600E-01 | 8.000E-01      | 6.585E-02 | 0.412   |
|         |           | 1271.85      |              | -1.760E-01          | 9.117E-01 | 1.474E+00      | 1.208E-01 | -0.119  |
| HO-166M | +         | 80.57        |              | -2.441E-01          | 1.878E-01 | 2.523E-01      | 2.622E-02 | -0.967  |
|         |           | 184.41       |              | 2.668E-01           | 6.326E-02 | 6.500E-02      | 6.067E-03 | 4.105   |
|         |           | 280.46       |              | 3.701E-02           | 9.511E-02 | 1.375E-01      | 1.533E-02 | 0.269   |
|         |           | 410.95       |              | 3.775E-01           | 2.700E-01 | 4.743E-01      | 4.419E-02 | 0.796   |
|         | +         | 711.68       | *            | -6.677E-03          | 6.738E-02 | 1.112E-01      | 1.217E-02 | -0.060  |
|         |           | 752.31       |              | -1.773E-01          | 3.245E-01 | 5.145E-01      | 5.537E-02 | -0.345  |
|         |           | 810.29       |              | -3.154E-02          | 6.484E-02 | 1.020E-01      | 1.057E-02 | -0.309  |
|         |           | 67.75        |              | 4.332E-02           | 5.489E-02 | 8.840E-02      | 8.795E-03 | 0.490   |
| TA-182  | +         | 100.11       |              | 9.162E-02           | 1.343E-01 | 2.300E-01      | 2.627E-02 | 0.398   |
|         |           | 152.43       |              | -3.602E-02          | 3.281E-01 | 5.431E-01      | 5.612E-02 | -0.066  |
|         |           | 222.11       |              | 3.019E-01           | 3.498E-01 | 5.848E-01      | 5.931E-02 | 0.516   |
|         |           | 1121.30      |              | 9.483E-01           | 4.135E-01 | 4.431E-01      | 3.807E-02 | 2.140   |
|         | +         | 1189.05      |              | -1.866E-01          | 3.780E-01 | 6.016E-01      | 4.952E-02 | -0.310  |
|         |           | 1221.41      | *            | -6.833E-03          | 2.661E-01 | 4.060E-01      | 3.339E-02 | -0.017  |
|         |           | 1231.02      |              | -1.686E-01          | 6.167E-01 | 9.980E-01      | 8.203E-02 | -0.169  |
| IR-192  | +         | 295.96       |              | 1.900E+00           | 3.057E-01 | 3.509E-01      | 3.888E-02 | 5.414   |
|         |           | 308.46       |              | 4.355E-04           | 9.472E-02 | 1.601E-01      | 1.750E-02 | 0.003   |
|         |           | 316.51       | *            | 1.261E-02           | 3.467E-02 | 5.948E-02      | 6.425E-03 | 0.212   |
| HG-203  | +         | 468.07       |              | 2.251E-03           | 8.125E-02 | 1.164E-01      | 1.219E-02 | 0.019   |
|         |           | 70.83        |              | 7.530E-01           | 8.184E-01 | 1.217E+00      | 2.052E-01 | 0.619   |
|         |           | 72.87        |              | 1.094E+00           | 5.376E-01 | 7.930E-01      | 1.300E-01 | 1.380   |
| BI-207  | +         | 279.20       | *            | 7.963E-03           | 4.881E-02 | 6.946E-02      | 7.871E-03 | 0.115   |
|         |           | 72.81        |              | 2.014E-01           | 1.109E-01 | 1.689E-01      | 1.705E-02 | 1.192   |
|         |           | 74.97        |              | 1.029E+00           | 1.377E-01 | 1.619E-01      | 1.646E-02 | 6.354   |
|         |           | 569.70       |              | -2.422E-03          | 3.508E-02 | 5.563E-02      | 5.951E-03 | -0.044  |
| PB-211  | +         | 1063.66      | *            | -1.940E-02          | 6.461E-02 | 1.057E-01      | 9.429E-03 | -0.184  |
|         |           | 1770.23      |              | -2.454E-01          | 5.333E-01 | 6.558E-01      | 5.399E-02 | -0.374  |
|         |           | 404.85       | *            | 1.794E-01           | 7.474E-01 | 1.244E+00      | 6.033E-01 | 0.144   |
|         |           | 427.09       |              | 5.050E-01           | 1.527E+00 | 2.535E+00      | 1.177E+00 | 0.199   |
| BI-212  | +         | 832.01       |              | -5.664E-01          | 1.242E+00 | 1.906E+00      | 9.936E-01 | -0.297  |
|         |           | 727.33       | *            | 2.836E+00           | 1.144E+00 | 1.454E+00      | 2.054E-01 | 1.950   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| RN-219  | +         | 785.37       |     | 5.126E+00           | 3.645E+00 | 6.522E+00      | 6.882E-01 | 0.786   |
|         |           | 1620.50      |     | 2.746E+00           | 2.966E+00 | 5.451E+00      | 4.530E-01 | 0.504   |
|         |           | 271.23       |     | 1.076E+00           | 4.289E-01 | 4.629E-01      | 5.719E-02 | 2.324   |
|         |           | 401.81       | *   | -4.111E-02          | 4.336E-01 | 7.133E-01      | 1.086E-01 | -0.058  |
| RA-223  | +         | 81.07        |     | -2.394E-01          | 1.498E-01 | 1.971E-01      | 2.052E-02 | -1.215  |
|         |           | 83.79        |     | 3.960E-01           | 1.104E-01 | 1.476E-01      | 1.556E-02 | 2.682   |
|         |           | 94.87        |     | 4.830E-01           | 3.318E-01 | 5.361E-01      | 5.958E-02 | 0.901   |
|         |           | 144.24       |     | 5.593E-01           | 6.218E-01 | 1.051E+00      | 1.251E-01 | 0.532   |
| AC-227  | +         | 154.21       |     | 1.824E-01           | 3.564E-01 | 6.019E-01      | 6.539E-02 | 0.303   |
|         |           | 269.46       |     | 8.358E-01           | 3.303E-01 | 3.572E-01      | 3.979E-02 | 2.340   |
|         |           | 323.87       | *   | -8.269E-02          | 6.857E-01 | 1.009E+00      | 1.861E-01 | -0.082  |
|         |           | 338.28       |     | 1.051E+01           | 2.407E+00 | 2.775E+00      | 3.724E-01 | 3.785   |
| TH-227  | +         | 79.69        |     | -1.101E+00          | 8.633E-01 | 1.140E+00      | 2.071E-01 | -0.966  |
|         |           | 235.96       |     | 9.534E-02           | 1.595E-01 | 2.359E-01      | 2.802E-02 | 0.404   |
|         |           | 256.23       | *   | -7.772E-02          | 2.468E-01 | 3.870E-01      | 5.295E-02 | -0.201  |
|         |           | 299.98       |     | 3.159E+00           | 1.271E+00 | 1.713E+00      | 2.470E-01 | 1.844   |
| PA-231  | +         | 304.50       |     | 7.548E-02           | 1.758E+00 | 2.611E+00      | 4.660E-01 | 0.029   |
|         |           | 334.37       |     | 1.472E-01           | 1.748E+00 | 2.597E+00      | 4.336E-01 | 0.057   |
|         |           | 79.80        |     | -1.402E+00          | 1.155E+00 | 1.511E+00      | 3.404E-01 | -0.928  |
|         |           | 235.96       |     | 9.534E-02           | 1.594E-01 | 2.359E-01      | 2.683E-02 | 0.404   |
| TH-231  | +         | 256.23       | *   | -7.772E-02          | 2.468E-01 | 3.870E-01      | 5.832E-02 | -0.201  |
|         |           | 299.98       |     | 3.159E+00           | 1.271E+00 | 1.713E+00      | 2.470E-01 | 1.844   |
|         |           | 304.50       |     | 7.548E-02           | 1.758E+00 | 2.611E+00      | 4.660E-01 | 0.029   |
|         |           | 334.37       |     | 1.472E-01           | 1.748E+00 | 2.597E+00      | 4.336E-01 | 0.057   |
| PA-233  | +         | 283.69       | *   | -4.550E-01          | 1.467E+00 | 2.278E+00      | 3.689E-01 | -0.200  |
|         |           | 301.36       |     | 2.029E+00           | 8.128E-01 | 1.065E+00      | 1.483E-01 | 1.905   |
|         |           | 81.07        |     | -2.394E-01          | 1.498E-01 | 1.971E-01      | 2.052E-02 | -1.215  |
|         |           | 83.79        |     | 3.960E-01           | 1.104E-01 | 1.476E-01      | 1.556E-02 | 2.682   |
| PA-234  | +         | 94.87        |     | 4.830E-01           | 3.318E-01 | 5.361E-01      | 5.958E-02 | 0.901   |
|         |           | 144.24       |     | 5.593E-01           | 6.218E-01 | 1.051E+00      | 1.251E-01 | 0.532   |
|         |           | 154.21       |     | 1.824E-01           | 3.564E-01 | 6.019E-01      | 6.539E-02 | 0.303   |
|         |           | 269.46       |     | 8.358E-01           | 3.303E-01 | 3.572E-01      | 3.979E-02 | 2.340   |
| PA-234M | +         | 323.87       | *   | -8.269E-02          | 6.857E-01 | 1.009E+00      | 1.861E-01 | -0.082  |
|         |           | 338.28       |     | 1.051E+01           | 2.407E+00 | 2.775E+00      | 3.724E-01 | 3.785   |
|         |           | 300.13       |     | 1.429E+00           | 5.853E-01 | 7.785E-01      | 1.270E-01 | 1.836   |
|         |           | 311.90       | *   | -3.085E-02          | 6.137E-02 | 1.009E-01      | 1.114E-02 | -0.306  |
| PA-234  | +         | 340.48       |     | 1.428E+00           | 8.055E-01 | 1.197E+00      | 2.963E-01 | 1.193   |
|         |           | 94.67        |     | 2.746E-01           | 1.279E-01 | 2.046E-01      | 2.913E-02 | 1.342   |
|         |           | 98.44        |     | 8.475E-02           | 8.602E-02 | 1.148E-01      | 6.458E-02 | 0.738   |
|         |           | 111.00       |     | -1.075E-01          | 1.418E-01 | 2.329E-01      | 3.444E-02 | -0.462  |
| PA-234M | +         | 131.20       |     | -8.770E-03          | 1.020E-01 | 1.512E-01      | 1.845E-02 | -0.058  |
|         |           | 569.50       |     | -2.148E-02          | 3.113E-01 | 4.937E-01      | 5.280E-02 | -0.044  |
|         |           | 733.00       |     | 2.064E-01           | 4.507E-01 | 6.768E-01      | 1.567E-01 | 0.305   |
|         |           | 880.51       |     | -1.196E-01          | 3.269E-01 | 5.154E-01      | 4.988E-02 | -0.232  |
| PA-234M | +         | 883.24       |     | 8.631E-02           | 3.424E-01 | 5.609E-01      | 3.778E-01 | 0.154   |
|         |           | 926.50       |     | 1.495E-02           | 2.224E-01 | 3.137E-01      | 8.019E-02 | 0.048   |
|         |           | 946.00       | *   | -8.436E-02          | 3.544E-01 | 5.606E-01      | 1.072E-01 | -0.150  |
|         |           | 949.00       |     | -1.371E-01          | 5.218E-01 | 8.238E-01      | 7.719E-02 | -0.166  |
| PA-234M | +         | 766.42       |     | 2.388E+01           | 2.135E+01 | 2.718E+01      | 1.389E+01 | 0.879   |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| NP-239  | 1001.03   | *            |     | 3.324E+00           | 5.550E+00 | 9.348E+00      | 9.792E-01 | 0.356   |
|         | 99.53     |              |     | 1.427E-01           | 1.208E-01 | 2.089E-01      | 2.379E-02 | 0.683   |
|         | 103.37    |              |     | -3.466E-02          | 7.825E-02 | 1.176E-01      | 1.366E-02 | -0.295  |
|         | +         | 106.12       |     | 1.075E-01           | 1.062E-01 | 1.151E-01      | 1.358E-02 | 0.934   |
|         | 117.23    | *            |     | -4.344E-01          | 3.223E-01 | 5.107E-01      | 6.407E-02 | -0.851  |
|         | 228.18    |              |     | 1.171E-02           | 2.134E-01 | 3.449E-01      | 3.540E-02 | 0.034   |
| AM-241  | +         | 277.60       |     | 2.651E-01           | 2.639E-01 | 3.253E-01      | 3.622E-02 | 0.815   |
|         | 59.54     | *            |     | -4.756E-02          | 5.725E-02 | 8.087E-02      | 8.403E-03 | -0.588  |
| CM-247  | +         | 278.00       |     | 1.126E+00           | 1.121E+00 | 1.375E+00      | 1.532E-01 | 0.819   |
|         | 287.50    |              |     | 1.024E+00           | 1.259E+00 | 2.072E+00      | 2.300E-01 | 0.494   |
| CF-249  | 402.40    | *            |     | -1.733E-02          | 3.992E-02 | 6.439E-02      | 5.934E-03 | -0.269  |
|         | 252.80    |              |     | 3.830E-01           | 8.723E-01 | 1.427E+00      | 1.530E-01 | 0.268   |
|         | 333.37    |              |     | 4.310E-02           | 1.933E-01 | 2.723E-01      | 2.863E-02 | 0.158   |
| CF-251  | 388.16    | *            |     | 1.703E-02           | 4.062E-02 | 6.891E-02      | 6.337E-03 | 0.247   |
|         | 177.52    | *            |     | -3.739E-02          | 1.201E-01 | 1.949E-01      | 1.789E-02 | -0.192  |
|         | 227.38    |              |     | -2.638E-02          | 3.444E-01 | 5.533E-01      | 5.670E-02 | -0.048  |
|         | 285.41    |              |     | -2.804E-01          | 2.244E+00 | 3.525E+00      | 3.920E-01 | -0.080  |

# VAX/VMS Nuclide Identification Report Generated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*                                     DETECTOR DATA                          *
*                                     *                                       *
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964002      *
* Acquisition date   : 10-MAR-2010 21:17:36 Detector SN#                   *
* Detector ID        : GAM25 Sensitivity : 5.000                          *
* Geometry           : CAN Energy tolerance: 1.500                        *
* Elapsed live time  : 0 02:00:00.00 Abundance limit : 75.000             *
* Elapsed real time  : 0 02:00:02.50 Half life ratio : 8.000              *
*****
*                                     SAMPLE DATA                            *
*                                     *                                       *
* Sample date       : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID         : G247964002 Analyst initials: MXR1                  *
* Batch Number      : 958216 Sample Quantity : 1.3467E+02 GRAM           *
* Recovery          : 1.00000 Carrier Weight : 0.00000                   *
*****
*                                     QC DATA                                *
*                                     *                                       *
* Standard Weight   : 0.00000                                              *
* CALIB. DATE/TIME  : 7-OCT-2009 09:38:43 MS Isotope :                   *
* MSD DPM           : 0.000 MSD Isotope :                               *
* LCS DPM           : 0.000 LCS Isotope :                               *
* LCSD DPM          : 0.000 LCSD Isotope :                               *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act error | MDA<br>(pCi/GRAM ) |           |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.900E+01               | 3.797E+00 | 4.678E-01          | 0.000E+00 |
| CD-109  | 5.997E+00               | 9.862E-01 | 7.736E-01          | 0.000E+00 |
| SN-126  | 5.825E-01               | 9.578E-02 | 7.499E-02          | 0.000E+00 |
| EU-155  | 1.351E-01               | 1.308E-01 | 1.378E-01          | 0.000E+00 |
| TL-208  | 7.850E-01               | 1.323E-01 | 6.795E-02          | 0.000E+00 |
| PB-210  | 1.656E+00               | 6.974E-01 | 6.700E-01          | 0.000E+00 |
| BI-211  | 6.736E+00               | 8.679E-01 | 3.276E-01          | 0.000E+00 |
| PB-212  | 2.598E+00               | 3.157E-01 | 8.665E-02          | 0.000E+00 |
| BI-214  | 2.099E+00               | 3.187E-01 | 1.206E-01          | 0.000E+00 |
| PB-214  | 2.445E+00               | 3.416E-01 | 1.192E-01          | 0.000E+00 |
| RA-224  | 7.928E+00               | 1.607E+00 | 9.298E-01          | 0.000E+00 |
| RA-226  | 2.099E+00               | 3.187E-01 | 1.206E-01          | 0.000E+00 |
| AC-228  | 2.781E+00               | 4.678E-01 | 2.303E-01          | 0.000E+00 |
| RA-228  | 2.781E+00               | 4.678E-01 | 2.303E-01          | 0.000E+00 |
| TH-228  | 2.598E+00               | 3.157E-01 | 8.665E-02          | 0.000E+00 |
| TH-229  | -3.151E-01              | 5.053E-01 | 8.520E-01          | 0.000E+00 |
| TH-232  | 2.781E+00               | 4.678E-01 | 2.303E-01          | 0.000E+00 |
| TH-234  | 2.613E+00               | 1.059E+00 | 8.672E-01          | 0.000E+00 |
| U-235   | 1.435E-01               | 1.826E-01 | 3.265E-01          | 0.000E+00 |
| NP-237  | 1.738E+00               | 4.574E-01 | 2.227E-01          | 0.000E+00 |
| U-238   | 2.613E+00               | 1.059E+00 | 8.672E-01          | 0.000E+00 |
| ANH-511 | 1.800E-01               | 8.355E-02 | 4.762E-02          | 0.000E+00 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | 3.059E-02                           | 3.706E-01                | 6.336E-01          | 0.000E+00 NOT IDENT. |
| NA-22   | -1.881E-03                          | 5.163E-02                | 8.676E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 1.151E+08                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| SC-46   | -3.808E-02                          | 4.538E-02                | 7.036E-02          | 0.000E+00 FAIL ABUN  |
| V-48    | -2.830E-02                          | 1.025E-01                | 1.661E-01          | 0.000E+00 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CR-51   | 1.225E-01  | 3.775E-01 | 6.793E-01 | 0.000E+00 | NOT IDENT. |
| MN-54   | 1.549E-02  | 4.436E-02 | 7.681E-02 | 0.000E+00 | NOT IDENT. |
| CO-56   | 2.031E-02  | 4.164E-02 | 7.318E-02 | 0.000E+00 | NOT IDENT. |
| CO-57   | 8.740E-03  | 2.015E-02 | 3.686E-02 | 0.000E+00 | NOT IDENT. |
| CO-58   | -4.871E-03 | 4.353E-02 | 7.320E-02 | 0.000E+00 | NOT IDENT. |
| FE-59   | -2.681E-03 | 1.232E-01 | 2.109E-01 | 0.000E+00 | NOT IDENT. |
| CO-60   | -1.280E-02 | 5.181E-02 | 8.501E-02 | 0.000E+00 | NOT IDENT. |
| ZN-65   | 5.739E-03  | 1.261E-01 | 1.868E-01 | 0.000E+00 | NOT IDENT. |
| SE-75   | 4.528E-02  | 4.721E-02 | 7.502E-02 | 0.000E+00 | NOT IDENT. |
| SR-85   | 6.248E-02  | 4.626E-02 | 7.553E-02 | 0.000E+00 | NOT IDENT. |
| Y-88    | 3.816E-02  | 3.653E-02 | 6.991E-02 | 0.000E+00 | NOT IDENT. |
| Y-91    | -9.366E+00 | 2.925E+01 | 4.611E+01 | 0.000E+00 | NOT IDENT. |
| NB-94   | 2.249E-02  | 3.750E-02 | 6.698E-02 | 0.000E+00 | NOT IDENT. |
| NB-95   | 7.458E-02  | 6.050E-02 | 9.852E-02 | 0.000E+00 | NOT IDENT. |
| NB-95M  | 1.995E-03  | 1.326E-01 | 2.009E-01 | 0.000E+00 | NOT IDENT. |
| ZR-95   | 7.805E-03  | 8.653E-02 | 1.489E-01 | 0.000E+00 | NOT IDENT. |
| MO-99   | 6.183E+00  | 3.717E+01 | 6.452E+01 | 0.000E+00 | NOT IDENT. |
| TC-99M  | 0.000E+00  | 4.264E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | 2.151E-02  | 4.470E-02 | 7.795E-02 | 0.000E+00 | FAIL ABUN  |
| RH-106  | -6.038E-02 | 3.151E-01 | 5.429E-01 | 0.000E+00 | NOT IDENT. |
| RU-106  | -6.038E-02 | 3.150E-01 | 5.429E-01 | 0.000E+00 | NOT IDENT. |
| AG-108M | 6.414E-03  | 2.918E-02 | 5.082E-02 | 0.000E+00 | NOT IDENT. |
| AG-110M | -9.674E-02 | 4.428E-02 | 6.418E-02 | 0.000E+00 | FAIL ABUN  |
| SN-113  | 7.396E-03  | 4.506E-02 | 7.896E-02 | 0.000E+00 | NOT IDENT. |
| CD-115  | 0.000E+00  | 4.518E+01 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| SN-117M | -2.999E-04 | 6.127E-02 | 1.081E-01 | 0.000E+00 | NOT IDENT. |
| TE-123M | -1.126E-02 | 2.636E-02 | 4.572E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | -5.758E-02 | 8.563E-02 | 1.280E-01 | 0.000E+00 | NOT IDENT. |
| SB-125  | 8.005E-02  | 8.960E-02 | 1.620E-01 | 0.000E+00 | FAIL ABUN  |
| TE-125M | 4.249E+00  | 8.391E+00 | 1.392E+01 | 0.000E+00 | NOT IDENT. |
| I-126   | -3.296E-01 | 3.387E-01 | 5.501E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | 5.804E-02  | 2.426E-01 | 3.701E-01 | 0.000E+00 | NOT IDENT. |
| SB-127  | 2.843E-01  | 3.189E+00 | 5.546E+00 | 0.000E+00 | NOT IDENT. |
| I-131   | 4.500E-02  | 1.620E-01 | 2.875E-01 | 0.000E+00 | NOT IDENT. |
| TE-132  | 1.043E-01  | 1.781E+00 | 3.044E+00 | 0.000E+00 | NOT IDENT. |
| BA-133  | 2.225E-02  | 4.649E-02 | 7.408E-02 | 0.000E+00 | FAIL ABUN  |
| I-133   | 0.000E+00  | 1.925E+05 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | 0.000E+00  | 7.746E-02 | 1.098E-01 | 0.000E+00 | FAIL ABUN  |
| CS-135  | 2.123E-01  | 1.716E-01 | 2.740E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 3.790E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -3.307E-02 | 1.413E-01 | 2.388E-01 | 0.000E+00 | NOT IDENT. |
| BA-137M | 3.975E-03  | 4.505E-02 | 8.125E-02 | 0.000E+00 | NOT IDENT. |
| CS-137  | 4.199E-03  | 4.760E-02 | 8.584E-02 | 0.000E+00 | NOT IDENT. |
| CE-139  | -2.209E-02 | 2.624E-02 | 4.442E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | -2.824E-02 | 3.807E-01 | 6.359E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | -8.546E-02 | 1.068E-01 | 1.603E-01 | 0.000E+00 | FAIL ABUN  |
| CE-141  | -2.813E-02 | 6.077E-02 | 1.061E-01 | 0.000E+00 | NOT IDENT. |
| CE-143  | 0.000E+00  | 2.225E+03 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CE-144  | -3.734E-02 | 1.789E-01 | 3.033E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | -6.710E-03 | 3.702E-02 | 6.311E-02 | 0.000E+00 | NOT IDENT. |
| PR-144  | -5.360E-01 | 2.775E+00 | 4.726E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | 4.777E-02  | 4.516E-02 | 8.146E-02 | 0.000E+00 | NOT IDENT. |
| ND-147  | 3.055E-01  | 7.694E-01 | 1.327E+00 | 0.000E+00 | FAIL ABUN  |
| PM-149  | 0.000E+00  | 3.522E+02 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| EU-152  | 6.032E-03  | 1.003E-01 | 1.645E-01 | 0.000E+00 | NOT IDENT. |
| GD-153  | -6.456E-02 | 6.615E-02 | 1.033E-01 | 0.000E+00 | NOT IDENT. |
| EU-154  | -4.264E-02 | 1.493E-01 | 2.456E-01 | 0.000E+00 | NOT IDENT. |
| TB-160  | -7.404E-02 | 1.634E-01 | 2.640E-01 | 0.000E+00 | FAIL ABUN  |
| HO-166M | -6.677E-03 | 6.603E-02 | 1.129E-01 | 0.000E+00 | FAIL ABUN  |
| TA-182  | -6.833E-03 | 2.608E-01 | 4.083E-01 | 0.000E+00 | FAIL ABUN  |
| IR-192  | 1.261E-02  | 3.398E-02 | 6.131E-02 | 0.000E+00 | FAIL ABUN  |
| HG-203  | 7.963E-03  | 4.783E-02 | 7.175E-02 | 0.000E+00 | NOT IDENT. |
| BI-207  | -1.940E-02 | 6.332E-02 | 1.065E-01 | 0.000E+00 | FAIL ABUN  |
| PB-211  | 1.794E-01  | 7.325E-01 | 1.276E+00 | 0.000E+00 | NOT IDENT. |
| BI-212  | 0.000E+00  | 1.121E+00 | 1.476E+00 | 0.000E+00 | FAIL ABUN  |
| RN-219  | -4.111E-02 | 4.249E-01 | 7.321E-01 | 0.000E+00 | FAIL ABUN  |
| RA-223  | -8.269E-02 | 6.720E-01 | 1.040E+00 | 0.000E+00 | FAIL ABUN  |
| AC-227  | -7.772E-02 | 2.418E-01 | 4.004E-01 | 0.000E+00 | FAIL ABUN  |
| TH-227  | -7.772E-02 | 2.419E-01 | 4.004E-01 | 0.000E+00 | FAIL ABUN  |
| PA-231  | -4.550E-01 | 1.437E+00 | 2.352E+00 | 0.000E+00 | FAIL ABUN  |
| TH-231  | -8.269E-02 | 6.720E-01 | 1.040E+00 | 0.000E+00 | FAIL ABUN  |
| PA-233  | -3.085E-02 | 6.015E-02 | 1.040E-01 | 0.000E+00 | FAIL ABUN  |
| PA-234  | -8.436E-02 | 3.473E-01 | 5.664E-01 | 0.000E+00 | NOT IDENT. |
| PA-234M | 3.324E+00  | 5.439E+00 | 9.435E+00 | 0.000E+00 | FAIL ABUN  |
| NP-239  | -4.344E-01 | 3.158E-01 | 5.356E-01 | 0.000E+00 | FAIL ABUN  |
| AM-241  | -4.756E-02 | 5.611E-02 | 8.580E-02 | 0.000E+00 | NOT IDENT. |
| CM-247  | -1.733E-02 | 3.912E-02 | 6.608E-02 | 0.000E+00 | FAIL ABUN  |
| CF-249  | 1.703E-02  | 3.981E-02 | 7.077E-02 | 0.000E+00 | NOT IDENT. |

|        |            |           |           |                      |
|--------|------------|-----------|-----------|----------------------|
| CF-251 | -3.739E-02 | 1.177E-01 | 2.029E-01 | 0.000E+00 NOT IDENT. |
|--------|------------|-----------|-----------|----------------------|

## VAX/VMS Nuclide Identification Report Generated 10-MAR-2010 23:18:22.61

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964002.CNF;1
Sample date        : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 21:17:36
Sample ID          : G247964002 Sample quantity : 1.34670E+02 GRAM
Detector name      : GAM25 Detector geometry: CAN
Elapsed live time  : 0 02:00:00.00 Elapsed real time: 0 02:00:02.50 0.0%
Energy tolerance   : 1.50000 keV Analyst Initials : MXR1
Abundance limit    : 75.00000 Sensitivity : 5.00000
Batch ID           : 958216 Detector SN# :
Matrix Spike ID    : LCS ID : 1032-A
*****

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## Nuclide Line Activity Report

## Nuclide Type:

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|-------------------------|------------------------|-------------------|
| K-40    | 1460.82 | 1653  | 10.66* | 1.109E+00 | 3.900E+01               | 3.900E+01              | 9.93              |
| CD-109  | 88.03   | 727   | 3.70*  | 9.407E+00 | 5.825E+00               | 5.997E+00              | 16.78             |
| SN-126  | 64.28   | 339   | 9.60   | 9.778E+00 | 1.007E+00               | 1.007E+00              | 40.04             |
|         | 86.94   | 727   | 8.90   | 9.407E+00 | 2.421E+00               | 2.421E+00              | 43.79             |
|         | 87.57   | 727   | 37.00* | 9.407E+00 | 5.825E-01               | 5.825E-01              | 16.78             |
| EU-155  | 86.55   | 727   | 30.70  | 9.407E+00 | 7.020E-01               | 7.074E-01              | 16.83             |
|         | 105.31  | 90    | 21.10* | 8.823E+00 | 1.340E-01               | 1.351E-01              | 98.78             |
| TL-208  | 277.37  | 65    | 6.60   | 4.739E+00 | 5.800E-01               | 5.800E-01              | 99.96             |
|         | 583.19  | 598   | 85.00* | 2.497E+00 | 7.850E-01               | 7.850E-01              | 17.19             |
|         | 860.56  | 57    | 12.50  | 1.765E+00 | 7.249E-01               | 7.249E-01              | 50.48             |
| PB-210  | 46.54   | 231   | 4.25*  | 9.179E+00 | 1.653E+00               | 1.656E+00              | 42.98             |
| BI-211  | 72.87   | ----- | 1.23   | 9.724E+00 | -----                   | Line Not Found         | -----             |
|         | 351.06  | 1214  | 12.92* | 3.887E+00 | 6.736E+00               | 6.736E+00              | 13.15             |
| PB-212  | 74.82   | 1276  | 10.28  | 9.695E+00 | 3.569E+00               | 3.569E+00              | 16.55             |
|         | 77.11   | 2011  | 17.10  | 9.653E+00 | 3.396E+00               | 3.396E+00              | 11.75             |
|         | 238.63  | 2170  | 43.60* | 5.340E+00 | 2.598E+00               | 2.598E+00              | 12.40             |
|         | 300.09  | 151   | 3.30   | 4.443E+00 | 2.872E+00               | 2.872E+00              | 39.60             |
| BI-214  | 609.32  | 822   | 45.49* | 2.401E+00 | 2.099E+00               | 2.099E+00              | 15.49             |
|         | 1120.29 | 148   | 14.92  | 1.398E+00 | 1.972E+00               | 1.972E+00              | 44.11             |
|         | 1764.49 | 140   | 15.30  | 9.412E-01 | 2.706E+00               | 2.706E+00              | 21.41             |
| PB-214  | 74.82   | 1276  | 5.80   | 9.695E+00 | 6.325E+00               | 6.325E+00              | 15.56             |
|         | 77.11   | 2011  | 9.70   | 9.653E+00 | 5.988E+00               | 5.988E+00              | 14.35             |
|         | 242.00  | 617   | 7.25   | 5.289E+00 | 4.483E+00               | 4.484E+00              | 21.48             |
|         | 295.22  | 735   | 18.42  | 4.503E+00 | 2.468E+00               | 2.468E+00              | 17.33             |
|         | 351.93  | 1214  | 35.60* | 3.887E+00 | 2.445E+00               | 2.445E+00              | 14.26             |
| RA-224  | 240.99  | 617   | 4.10*  | 5.289E+00 | 7.928E+00               | 7.928E+00              | 20.69             |
| RA-226  | 609.32  | 822   | 45.49* | 2.401E+00 | 2.099E+00               | 2.099E+00              | 15.49             |
|         | 1120.29 | 148   | 14.92  | 1.398E+00 | 1.972E+00               | 1.972E+00              | 44.11             |
|         | 1764.49 | 140   | 15.30  | 9.412E-01 | 2.706E+00               | 2.706E+00              | 21.41             |
| AC-228  | 338.32  | 430   | 11.27  | 4.020E+00 | 2.647E+00               | 2.647E+00              | 46.04             |
|         | 911.20  | 432   | 25.80* | 1.678E+00 | 2.781E+00               | 2.781E+00              | 17.16             |
|         | 968.97  | 251   | 15.80  | 1.590E+00 | 2.789E+00               | 2.789E+00              | 34.40             |

Nuclide Type:

| Nuclide | Energy | Area  | %Abn    | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|--------|-------|---------|-----------|-------------------------|------------------------|-------------------|
| RA-228  | 338.32 | 430   | 11.27   | 4.020E+00 | 2.647E+00               | 2.647E+00              | 46.04             |
|         | 911.20 | 432   | 25.80*  | 1.678E+00 | 2.781E+00               | 2.781E+00              | 17.16             |
|         | 968.97 | 251   | 15.80   | 1.590E+00 | 2.789E+00               | 2.789E+00              | 34.40             |
| TH-228  | 74.82  | 1276  | 10.28   | 9.695E+00 | 3.569E+00               | 3.569E+00              | 13.44             |
|         | 77.11  | 2011  | 17.10   | 9.653E+00 | 3.396E+00               | 3.396E+00              | 11.75             |
|         | 238.63 | 2170  | 43.60*  | 5.340E+00 | 2.598E+00               | 2.598E+00              | 12.40             |
|         | 300.09 | 151   | 3.30    | 4.443E+00 | 2.872E+00               | 2.872E+00              | 72.14             |
| TH-229  | 85.43  | 333   | 14.70   | 9.489E+00 | 6.654E-01               | 6.654E-01              | 27.88             |
|         | 88.47  | 727   | 24.00   | 9.407E+00 | 8.979E-01               | 8.980E-01              | 16.78             |
|         | 193.51 | ----- | 4.41*   | 6.239E+00 | -----                   | Line Not Found         | -----             |
|         | 210.85 | ----- | 2.80    | 5.863E+00 | -----                   | Line Not Found         | -----             |
| TH-232  | 338.32 | 430   | 11.27   | 4.020E+00 | 2.647E+00               | 2.647E+00              | 21.29             |
|         | 911.20 | 432   | 25.80*  | 1.678E+00 | 2.781E+00               | 2.781E+00              | 17.16             |
|         | 968.97 | 251   | 15.80   | 1.590E+00 | 2.789E+00               | 2.789E+00              | 34.40             |
| TH-234  | 63.29  | 339   | 3.70*   | 9.778E+00 | 2.613E+00               | 2.613E+00              | 41.35             |
|         | 92.59  | 595   | 4.23    | 9.242E+00 | 4.245E+00               | 4.245E+00              | 28.10             |
| U-235   | 89.96  | 473   | 3.47    | 9.329E+00 | 4.073E+00               | 4.073E+00              | 30.57             |
|         | 93.35  | 595   | 5.60    | 9.242E+00 | 3.206E+00               | 3.206E+00              | 28.91             |
|         | 143.76 | ----- | 10.96*  | 7.568E+00 | -----                   | Line Not Found         | -----             |
|         | 163.33 | ----- | 5.08    | 6.998E+00 | -----                   | Line Not Found         | -----             |
|         | 185.72 | 442   | 57.20   | 6.418E+00 | 3.359E-01               | 3.359E-01              | 23.71             |
|         | 205.31 | ----- | 5.01    | 5.979E+00 | -----                   | Line Not Found         | -----             |
| NP-237  | 86.48  | 727   | 12.40*  | 9.407E+00 | 1.738E+00               | 1.738E+00              | 26.86             |
|         | 95.86  | ----- | 2.68    | 9.143E+00 | -----                   | Line Not Found         | -----             |
| U-238   | 63.29  | 339   | 3.70*   | 9.778E+00 | 2.613E+00               | 2.613E+00              | 41.35             |
|         | 92.59  | 595   | 4.23    | 9.242E+00 | 4.245E+00               | 4.245E+00              | 19.40             |
| ANH-511 | 511.00 | 181   | 100.00* | 2.809E+00 | 1.800E-01               | 1.800E-01              | 47.37             |

Flag: "\*" = Keyline



Total number of lines in spectrum 41  
Number of unidentified lines 8  
Number of lines tentatively identified by NID 33 80.49%

Nuclide Type :

| Nuclide | Hlife     | Decay | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|-------|-------------------------|------------------------|-----------------------------|-------------------|-------|
| K-40    | 1.25E+09Y | 1.00  | 3.900E+01               | 3.900E+01              | 0.387E+01                   | 9.93              |       |
| CD-109  | 461.40D   | 1.03  | 5.825E+00               | 5.997E+00              | 1.006E+00                   | 16.78             |       |
| SN-126  | 2.30E+05Y | 1.00  | 5.825E-01               | 5.825E-01              | 0.977E-01                   | 16.78             |       |
| EU-155  | 4.75Y     | 1.01  | 1.340E-01               | 1.351E-01              | 1.334E-01                   | 98.78             |       |
| TL-208  | 1.41E+10Y | 1.00  | 7.850E-01               | 7.850E-01              | 1.350E-01                   | 17.19             |       |
| PB-210  | 22.20Y    | 1.00  | 1.653E+00               | 1.656E+00              | 0.712E+00                   | 42.98             |       |
| BI-211  | 7.04E+08Y | 1.00  | 6.736E+00               | 6.736E+00              | 0.886E+00                   | 13.15             |       |
| PB-212  | 1.41E+10Y | 1.00  | 2.598E+00               | 2.598E+00              | 0.322E+00                   | 12.40             |       |
| BI-214  | 1600.00Y  | 1.00  | 2.099E+00               | 2.099E+00              | 0.325E+00                   | 15.49             |       |
| PB-214  | 1600.00Y  | 1.00  | 2.445E+00               | 2.445E+00              | 0.349E+00                   | 14.26             |       |
| RA-224  | 1.41E+10Y | 1.00  | 7.928E+00               | 7.928E+00              | 1.640E+00                   | 20.69             |       |
| RA-226  | 1600.00Y  | 1.00  | 2.099E+00               | 2.099E+00              | 0.325E+00                   | 15.49             |       |
| AC-228  | 1.41E+10Y | 1.00  | 2.781E+00               | 2.781E+00              | 0.477E+00                   | 17.16             |       |
| RA-228  | 1.41E+10Y | 1.00  | 2.781E+00               | 2.781E+00              | 0.477E+00                   | 17.16             |       |
| TH-228  | 1.41E+10Y | 1.00  | 2.598E+00               | 2.598E+00              | 0.322E+00                   | 12.40             |       |
| TH-229  | 7340.00Y  | 1.00  | 8.979E-01               | 8.980E-01              | 1.507E-01                   | 16.78             | K     |
| TH-232  | 1.41E+10Y | 1.00  | 2.781E+00               | 2.781E+00              | 0.477E+00                   | 17.16             |       |
| TH-234  | 4.47E+09Y | 1.00  | 2.613E+00               | 2.613E+00              | 1.081E+00                   | 41.35             |       |
| U-235   | 7.04E+08Y | 1.00  | 3.359E-01               | 3.359E-01              | 0.796E-01                   | 23.71             | K     |
| NP-237  | 2.14E+06Y | 1.00  | 1.738E+00               | 1.738E+00              | 0.467E+00                   | 26.86             |       |
| U-238   | 4.47E+09Y | 1.00  | 2.613E+00               | 2.613E+00              | 1.081E+00                   | 41.35             |       |
| ANH-511 | 1.00E+09Y | 1.00  | 1.800E-01               | 1.800E-01              | 0.853E-01                   | 47.37             |       |

Total Activity : 9.120E+01 9.138E+01

Grand Total Activity : 9.120E+01 9.138E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

| It | Energy  | Area | Bkgnd | FWHM  | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|-------|---------|------|----|----------|------|----------|-------|
| 0  | 128.76  | 126  | 490   | 1.17  | 257.08  | 254  | 8  | 1.74E-02 | 64.2 | 8.04E+00 |       |
| 0  | 209.19  | 227  | 390   | 0.96  | 417.92  | 414  | 10 | 3.15E-02 | 35.3 | 5.90E+00 |       |
| 0  | 270.06  | 202  | 316   | 1.21  | 539.65  | 534  | 12 | 2.80E-02 | 37.9 | 4.84E+00 | T     |
| 0  | 327.70  | 90   | 194   | 1.21  | 654.92  | 651  | 9  | 1.24E-02 | 59.9 | 4.13E+00 | T     |
| 0  | 463.11  | 149  | 168   | 1.32  | 925.73  | 920  | 13 | 2.06E-02 | 39.6 | 3.06E+00 | T     |
| 0  | 727.19  | 139  | 130   | 1.63  | 1453.86 | 1447 | 13 | 1.93E-02 | 37.8 | 2.05E+00 | T     |
| 0  | 767.82  | 54   | 112   | 0.79  | 1535.13 | 1534 | 8  | 7.44E-03 | 73.4 | 1.95E+00 | T     |
| 0  | 794.84  | 70   | 86    | 1.51  | 1589.16 | 1584 | 11 | 9.78E-03 | 56.7 | 1.89E+00 | T     |
| 0  | 935.13  | 96   | 66    | 1.86  | 1869.75 | 1860 | 20 | 1.33E-02 | 47.4 | 1.64E+00 |       |
| 0  | 1213.98 | 40   | 83    | 3.08  | 2427.46 | 2420 | 13 | 5.61E-03 | 98.8 | 1.30E+00 |       |
| 0  | 1377.09 | 66   | 16    | 2.09  | 2753.70 | 2745 | 16 | 9.17E-03 | 36.6 | 1.17E+00 |       |
| 0  | 1383.20 | 38   | 7     | 4.09  | 2765.91 | 2760 | 14 | 5.28E-03 | 43.9 | 1.16E+00 | T     |
| 0  | 1417.27 | 103  | 36    | 15.34 | 2834.06 | 2811 | 49 | 1.43E-02 | 47.0 | 1.14E+00 |       |
| 0  | 1729.04 | 37   | 7     | 0.93  | 3457.66 | 3451 | 13 | 5.07E-03 | 43.9 | 9.58E-01 |       |
| 0  | 1846.36 | 45   | 0     | 1.95  | 3692.31 | 3684 | 16 | 6.25E-03 | 29.8 | 9.05E-01 |       |

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC
*                                     2040 Savage Road
*                                     Charleston, SC 29414
*****
*
*                               DETECTOR DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964002.CNF;1
* Acquisition date   : 10-MAR-2010 21:17:36 Detector SN#      :
* Detector ID        : GAM25 Sensitivity      : 5.00000
* Geometry           : CAN Energy tolerance: 1.50000
* Elapsed live time  : 0 02:00:00.00 Abundance limit : 75.00000
* Elapsed real time  : 0 02:00:02.50 Half life ratio : 8.00000
*****
*
*                               SAMPLE DATA
*
* Sample date        : 19-FEB-2010 12:00:00 Nuclide Library : SOLID
* Sample ID          : G247964002 Analyst initials: MXR1
* Batch Number       : 958216 Sample Quantity : 1.34670E+02 GRAM
*****
*
*                               QC DATA
*
* CALIB. DATE/TIME   : 7-OCT-2009 09:38:43.34MS Isotope      :
* MSD ID             : MSD Isotope      :
* LCS ID             : 1032-A LCS Isotope :
*****

```

## Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| K-40    | 3.900E+01              | 3.874E+00 | 4.668E-01         | 3.975E-02 | 83.549  |
| CD-109  | 5.997E+00              | 1.006E+00 | 7.340E-01         | 7.888E-02 | 8.170   |
| SN-126  | 5.825E-01              | 9.774E-02 | 7.114E-02         | 7.629E-03 | 8.187   |
| EU-155  | 1.351E-01              | 1.334E-01 | 1.311E-01         | 1.550E-02 | 1.030   |
| TL-208  | 7.850E-01              | 1.350E-01 | 6.666E-02         | 7.509E-03 | 11.775  |
| PB-210  | 1.656E+00              | 7.116E-01 | 6.289E-01         | 6.441E-02 | 2.633   |
| BI-211  | 6.736E+00              | 8.856E-01 | 3.185E-01         | 3.356E-02 | 21.151  |
| PB-212  | 2.598E+00              | 3.222E-01 | 8.365E-02         | 9.557E-03 | 31.055  |
| BI-214  | 2.099E+00              | 3.252E-01 | 1.184E-01         | 1.434E-02 | 17.725  |
| PB-214  | 2.445E+00              | 3.486E-01 | 1.159E-01         | 1.376E-02 | 21.098  |
| RA-224  | 7.928E+00              | 1.640E+00 | 8.978E-01         | 9.434E-02 | 8.831   |
| RA-226  | 2.099E+00              | 3.252E-01 | 1.184E-01         | 1.434E-02 | 17.725  |
| AC-228  | 2.781E+00              | 4.773E-01 | 2.278E-01         | 2.784E-02 | 12.210  |
| RA-228  | 2.781E+00              | 4.773E-01 | 2.278E-01         | 2.784E-02 | 12.210  |
| TH-228  | 2.598E+00              | 3.222E-01 | 8.365E-02         | 9.557E-03 | 31.055  |
| TH-229  | 8.980E-01              | 1.507E-01 | 8.195E-01         | 7.815E-02 | 1.096   |
| TH-232  | 2.781E+00              | 4.773E-01 | 2.278E-01         | 2.784E-02 | 12.210  |
| TH-234  | 2.613E+00              | 1.081E+00 | 8.182E-01         | 1.553E-01 | 3.194   |

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| U-235   | 3.359E-01              | 7.963E-02 | 3.124E-01         | 5.739E-02 | 1.075   |
| NP-237  | 1.738E+00              | 4.667E-01 | 2.113E-01         | 4.970E-02 | 8.227   |
| U-238   | 2.613E+00              | 1.081E+00 | 8.182E-01         | 1.553E-01 | 3.194   |
| ANH-511 | 1.800E-01              | 8.525E-02 | 4.661E-02         | 4.797E-03 | 3.862   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| BE-7    | 3.059E-02                          |              | 3.782E-01 | 6.193E-01         | 6.555E-02 | 0.049   |
| NA-22   | -1.881E-03                         |              | 5.269E-02 | 8.635E-02         | 7.081E-03 | -0.022  |
| NA-24   | -1.631E+01                         |              | 5.873E+01 | Half-Life         | too short |         |
| SC-46   | -3.808E-02                         |              | 4.631E-02 | 6.956E-02         | 6.661E-03 | -0.547  |
| V-48    | -2.830E-02                         |              | 1.046E-01 | 1.645E-01         | 1.525E-02 | -0.172  |
| CR-51   | 1.225E-01                          |              | 3.852E-01 | 6.592E-01         | 7.316E-02 | 0.186   |
| MN-54   | 1.549E-02                          |              | 4.526E-02 | 7.585E-02         | 7.697E-03 | 0.204   |
| CO-56   | 2.031E-02                          |              | 4.249E-02 | 7.229E-02         | 7.253E-03 | 0.281   |
| CO-57   | 8.740E-03                          |              | 2.056E-02 | 3.517E-02         | 4.536E-03 | 0.248   |
| CO-58   | -4.871E-03                         |              | 4.442E-02 | 7.225E-02         | 7.496E-03 | -0.067  |
| FE-59   | -2.681E-03                         |              | 1.257E-01 | 2.094E-01         | 1.972E-02 | -0.013  |
| CO-60   | -1.280E-02                         |              | 5.287E-02 | 8.469E-02         | 6.878E-03 | -0.151  |
| ZN-65   | 5.739E-03                          |              | 1.287E-01 | 1.855E-01         | 1.602E-02 | 0.031   |
| SE-75   | 4.528E-02                          |              | 4.818E-02 | 7.255E-02         | 7.952E-03 | 0.624   |
| SR-85   | 6.248E-02                          |              | 4.721E-02 | 7.392E-02         | 7.627E-03 | 0.845   |
| Y-88    | 3.816E-02                          |              | 3.728E-02 | 7.006E-02         | 5.726E-03 | 0.545   |
| Y-91    | -9.366E+00                         |              | 2.985E+01 | 4.585E+01         | 3.773E+00 | -0.204  |
| NB-94   | 2.249E-02                          |              | 3.826E-02 | 6.594E-02         | 7.240E-03 | 0.341   |
| NB-95   | 7.458E-02                          |              | 6.174E-02 | 9.713E-02         | 1.038E-02 | 0.768   |
| NB-95M  | 1.995E-03                          |              | 1.353E-01 | 1.939E-01         | 2.226E-02 | 0.010   |
| ZR-95   | 7.805E-03                          |              | 8.830E-02 | 1.468E-01         | 1.684E-02 | 0.053   |
| MO-99   | 6.183E+00                          |              | 3.793E+01 | 6.357E+01         | 1.085E+01 | 0.097   |
| TC-99M  | -5.201E+14                         |              | 2.175E+15 | Half-Life         | too short |         |
| RU-103  | 2.151E-02                          |              | 4.562E-02 | 7.625E-02         | 1.142E-02 | 0.282   |
| RH-106  | -6.038E-02                         |              | 3.215E-01 | 5.332E-01         | 7.933E-02 | -0.113  |
| RU-106  | -6.038E-02                         |              | 3.214E-01 | 5.332E-01         | 5.839E-02 | -0.113  |
| AG-108M | 6.414E-03                          |              | 2.978E-02 | 4.959E-02         | 4.872E-03 | 0.129   |
| AG-110M | -9.674E-02                         |              | 4.519E-02 | 6.310E-02         | 7.111E-03 | -1.533  |
| SN-113  | 7.396E-03                          |              | 4.598E-02 | 7.691E-02         | 7.183E-03 | 0.096   |
| CD-115  | -2.236E-05                         |              | 2.305E-05 | Half-Life         | too short |         |
| SN-117M | -2.999E-04                         |              | 6.252E-02 | 1.036E-01         | 1.006E-02 | -0.003  |
| TE-123M | -1.126E-02                         |              | 2.690E-02 | 4.383E-02         | 4.256E-03 | -0.257  |
| SB-124  | -5.758E-02                         |              | 8.737E-02 | 1.281E-01         | 1.110E-02 | -0.450  |
| SB-125  | 8.005E-02                          |              | 9.143E-02 | 1.580E-01         | 1.525E-02 | 0.507   |
| TE-125M | 4.249E+00                          |              | 8.562E+00 | 1.326E+01         | 1.778E+00 | 0.320   |
| I-126   | -3.296E-01                         |              | 3.456E-01 | 5.410E-01         | 5.989E-02 | -0.609  |
| SB-126  | 5.804E-02                          |              | 2.475E-01 | 3.645E-01         | 3.978E-02 | 0.159   |
| SB-127  | 2.843E-01                          |              | 3.254E+00 | 5.457E+00         | 7.888E-01 | 0.052   |
| I-131   | 4.500E-02                          |              | 1.653E-01 | 2.797E-01         | 2.878E-02 | 0.161   |

----- Non-Identified Nuclides -----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| TE-132  | 1.043E-01                          |              | 1.817E+00 | 2.937E+00         | 5.182E-01 | 0.036   |
| BA-133  | 2.225E-02                          |              | 4.744E-02 | 7.202E-02         | 1.005E-02 | 0.309   |
| I-133   | 4.439E-02                          |              | 9.823E-02 | Half-Life         | too short |         |
| CS-134  | 1.372E-01                          | +            | 7.904E-02 | 1.084E-01         | 1.141E-02 | 1.266   |
| CS-135  | 2.123E-01                          |              | 1.751E-01 | 2.651E-01         | 3.200E-02 | 0.801   |
| I-135   | 1.773E+14                          |              | 1.934E+14 | Half-Life         | too short |         |
| CS-136  | -3.307E-02                         |              | 1.442E-01 | 2.369E-01         | 2.216E-02 | -0.140  |
| BA-137M | 3.975E-03                          |              | 4.597E-02 | 7.990E-02         | 8.850E-03 | 0.050   |
| CS-137  | 4.199E-03                          |              | 4.857E-02 | 8.440E-02         | 9.361E-03 | 0.050   |
| CE-139  | -2.209E-02                         |              | 2.678E-02 | 4.261E-02         | 3.799E-03 | -0.518  |
| BA-140  | -2.824E-02                         |              | 3.885E-01 | 6.229E-01         | 2.145E-01 | -0.045  |
| LA-140  | -8.546E-02                         |              | 1.090E-01 | 1.602E-01         | 1.332E-02 | -0.533  |
| CE-141  | -2.813E-02                         |              | 6.201E-02 | 1.016E-01         | 1.130E-02 | -0.277  |
| CE-143  | 7.318E-03                          |              | 1.135E-03 | Half-Life         | too short |         |
| CE-144  | -3.734E-02                         |              | 1.825E-01 | 2.898E-01         | 5.052E-02 | -0.129  |
| PM-144  | -6.710E-03                         |              | 3.778E-02 | 6.211E-02         | 6.835E-03 | -0.108  |
| PR-144  | -5.360E-01                         |              | 2.831E+00 | 4.651E+00         | 5.116E-01 | -0.115  |
| PM-146  | 4.777E-02                          |              | 4.608E-02 | 7.955E-02         | 9.192E-03 | 0.601   |
| ND-147  | 3.055E-01                          |              | 7.851E-01 | 1.300E+00         | 2.089E-01 | 0.235   |
| PM-149  | 7.891E-05                          |              | 1.797E-04 | Half-Life         | too short |         |
| EU-152  | 6.032E-03                          |              | 1.024E-01 | 1.598E-01         | 1.716E-02 | 0.038   |
| GD-153  | -6.456E-02                         |              | 6.750E-02 | 9.815E-02         | 1.105E-02 | -0.658  |
| EU-154  | -4.264E-02                         |              | 1.524E-01 | 2.445E-01         | 2.703E-02 | -0.174  |
| TB-160  | -7.404E-02                         |              | 1.668E-01 | 2.609E-01         | 2.528E-02 | -0.284  |
| HO-166M | -6.677E-03                         |              | 6.738E-02 | 1.112E-01         | 1.217E-02 | -0.060  |
| TA-182  | -6.833E-03                         |              | 2.661E-01 | 4.060E-01         | 3.339E-02 | -0.017  |
| IR-192  | 1.261E-02                          |              | 3.467E-02 | 5.948E-02         | 6.425E-03 | 0.212   |
| HG-203  | 7.963E-03                          |              | 4.881E-02 | 6.946E-02         | 7.871E-03 | 0.115   |
| BI-207  | -1.940E-02                         |              | 6.461E-02 | 1.057E-01         | 9.429E-03 | -0.184  |
| PB-211  | 1.794E-01                          |              | 7.474E-01 | 1.244E+00         | 6.033E-01 | 0.144   |
| BI-212  | 2.836E+00                          | +            | 1.144E+00 | 1.454E+00         | 2.054E-01 | 1.950   |
| RN-219  | -4.111E-02                         |              | 4.336E-01 | 7.133E-01         | 1.086E-01 | -0.058  |
| RA-223  | -8.269E-02                         |              | 6.857E-01 | 1.009E+00         | 1.861E-01 | -0.082  |
| AC-227  | -7.772E-02                         |              | 2.468E-01 | 3.870E-01         | 5.295E-02 | -0.201  |
| TH-227  | -7.772E-02                         |              | 2.468E-01 | 3.870E-01         | 5.832E-02 | -0.201  |
| PA-231  | -4.550E-01                         |              | 1.467E+00 | 2.278E+00         | 3.689E-01 | -0.200  |
| TH-231  | -8.269E-02                         |              | 6.857E-01 | 1.009E+00         | 1.861E-01 | -0.082  |
| PA-233  | -3.085E-02                         |              | 6.137E-02 | 1.009E-01         | 1.114E-02 | -0.306  |
| PA-234  | -8.436E-02                         |              | 3.544E-01 | 5.606E-01         | 1.072E-01 | -0.150  |
| PA-234M | 3.324E+00                          |              | 5.550E+00 | 9.348E+00         | 9.792E-01 | 0.356   |
| NP-239  | -4.344E-01                         |              | 3.223E-01 | 5.107E-01         | 6.407E-02 | -0.851  |
| AM-241  | -4.756E-02                         |              | 5.725E-02 | 8.087E-02         | 8.403E-03 | -0.588  |
| CM-247  | -1.733E-02                         |              | 3.992E-02 | 6.439E-02         | 5.934E-03 | -0.269  |
| CF-249  | 1.703E-02                          |              | 4.062E-02 | 6.891E-02         | 6.337E-03 | 0.247   |
| CF-251  | -3.739E-02                         |              | 1.201E-01 | 1.949E-01         | 1.789E-02 | -0.192  |

# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : SYSSYSROOT:[ALPHA.ARCHIVE.GAMMA]G247964002            *
* Acquisition date   : 10-MAR-2010 21:17:36 Detector SN#      :              *
* Detector ID        : GAM25                      Sensitivity   : 5.000        *
* Geometry           : CAN                        Energy tolerance: 1.500        *
* Elapsed live time  : 0 02:00:00.00             Abundance limit : 75.000        *
* Elapsed real time  : 0 02:00:02.50             Half life ratio : 8.000        *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date        : 19-FEB-2010 12:00:00 Nuclide Library : SOLID            *
* Sample ID          : G247964002              Analyst initials: MXR1          *
* Batch Number       : 958216                  Sample Quantity : 1.3467E+02 GRAM   *
* Recovery           : 1.00000                 Carrier Weight  : 0.00000        *
*****
*
*                                     QC DATA                                *
*
* CALIB. DATE/TIME   : 7-OCT-2009 09:38:43 MS Isotope         :              *
* MSD DPM             : 0.000                      MSD Isotope   :              *
* LCS DPM             : 0.000                      LCS Isotope   :              *
* LCSD DPM            : 0.000                      LCSD Isotope  :              *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act Error | DLC<br>(pCi/GRAM ) | TPU       |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.900E+01               | 3.797E+00 | 2.340E-01          | 1.937E+00 |
| CD-109  | 5.997E+00               | 9.862E-01 | 3.870E-01          | 5.032E-01 |
| SN-126  | 5.825E-01               | 9.578E-02 | 3.752E-02          | 4.887E-02 |
| EU-155  | 1.351E-01               | 1.308E-01 | 6.892E-02          | 6.672E-02 |
| TL-208  | 7.850E-01               | 1.323E-01 | 3.400E-02          | 6.748E-02 |
| PB-210  | 1.656E+00               | 6.974E-01 | 3.352E-01          | 3.558E-01 |
| BI-211  | 6.736E+00               | 8.679E-01 | 1.639E-01          | 4.428E-01 |
| PB-212  | 2.598E+00               | 3.157E-01 | 4.335E-02          | 1.611E-01 |
| BI-214  | 2.099E+00               | 3.187E-01 | 6.033E-02          | 1.626E-01 |
| PB-214  | 2.445E+00               | 3.416E-01 | 5.964E-02          | 1.743E-01 |
| RA-224  | 7.928E+00               | 1.607E+00 | 4.652E-01          | 8.201E-01 |
| RA-226  | 2.099E+00               | 3.187E-01 | 6.033E-02          | 1.626E-01 |
| AC-228  | 2.781E+00               | 4.678E-01 | 1.152E-01          | 2.387E-01 |
| RA-228  | 2.781E+00               | 4.678E-01 | 1.152E-01          | 2.387E-01 |
| TH-228  | 2.598E+00               | 3.157E-01 | 4.335E-02          | 1.611E-01 |
| TH-229  | -3.151E-01              | 5.053E-01 | 4.262E-01          | 2.578E-01 |
| TH-232  | 2.781E+00               | 4.678E-01 | 1.152E-01          | 2.387E-01 |
| TH-234  | 2.613E+00               | 1.059E+00 | 4.339E-01          | 5.403E-01 |
| U-235   | 1.435E-01               | 1.826E-01 | 1.634E-01          | 9.318E-02 |
| NP-237  | 1.738E+00               | 4.574E-01 | 1.114E-01          | 2.334E-01 |
| U-238   | 2.613E+00               | 1.059E+00 | 4.339E-01          | 5.403E-01 |
| ANH-511 | 1.800E-01               | 8.355E-02 | 2.383E-02          | 4.263E-02 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act error | DLC<br>(pCi/GRAM ) | TPU                  |
|---------|-------------------------------------|---------------|--------------------|----------------------|
| BE-7    | 3.059E-02                           | 3.706E-01     | 3.170E-01          | 1.891E-01 NOT IDENT. |
| NA-22   | -1.881E-03                          | 5.163E-02     | 4.341E-02          | 2.634E-02 NOT IDENT. |
| NA-24   | -1.631E+07                          | 1.151E+08     | 0.000E+00          | 5.873E+07 SHORT HLIF |
| SC-46   | -3.808E-02                          | 4.538E-02     | 3.520E-02          | 2.316E-02 FAIL ABUN  |
| V-48    | -2.830E-02                          | 1.025E-01     | 8.311E-02          | 5.232E-02 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CR-51   | 1.225E-01  | 3.775E-01 | 3.398E-01 | 1.926E-01 | NOT IDENT. |
| MN-54   | 1.549E-02  | 4.436E-02 | 3.843E-02 | 2.263E-02 | NOT IDENT. |
| CO-56   | 2.031E-02  | 4.164E-02 | 3.661E-02 | 2.125E-02 | NOT IDENT. |
| CO-57   | 8.740E-03  | 2.015E-02 | 1.844E-02 | 1.028E-02 | NOT IDENT. |
| CO-58   | -4.871E-03 | 4.353E-02 | 3.662E-02 | 2.221E-02 | NOT IDENT. |
| FE-59   | -2.681E-03 | 1.232E-01 | 1.055E-01 | 6.286E-02 | NOT IDENT. |
| CO-60   | -1.280E-02 | 5.181E-02 | 4.253E-02 | 2.643E-02 | NOT IDENT. |
| ZN-65   | 5.739E-03  | 1.261E-01 | 9.346E-02 | 6.434E-02 | NOT IDENT. |
| SE-75   | 4.528E-02  | 4.721E-02 | 3.753E-02 | 2.409E-02 | NOT IDENT. |
| SR-85   | 6.248E-02  | 4.626E-02 | 3.779E-02 | 2.360E-02 | NOT IDENT. |
| Y-88    | 3.816E-02  | 3.653E-02 | 3.497E-02 | 1.864E-02 | NOT IDENT. |
| Y-91    | -9.366E+00 | 2.925E+01 | 2.307E+01 | 1.492E+01 | NOT IDENT. |
| NB-94   | 2.249E-02  | 3.750E-02 | 3.351E-02 | 1.913E-02 | NOT IDENT. |
| NB-95   | 7.458E-02  | 6.050E-02 | 4.929E-02 | 3.087E-02 | NOT IDENT. |
| NB-95M  | 1.995E-03  | 1.326E-01 | 1.005E-01 | 6.766E-02 | NOT IDENT. |
| ZR-95   | 7.805E-03  | 8.653E-02 | 7.450E-02 | 4.415E-02 | NOT IDENT. |
| MO-99   | 6.183E+00  | 3.717E+01 | 3.228E+01 | 1.897E+01 | NOT IDENT. |
| TC-99M  | -5.201E+20 | 4.264E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | 2.151E-02  | 4.470E-02 | 3.900E-02 | 2.281E-02 | FAIL ABUN  |
| RH-106  | -6.038E-02 | 3.151E-01 | 2.716E-01 | 1.607E-01 | NOT IDENT. |
| RU-106  | -6.038E-02 | 3.150E-01 | 2.716E-01 | 1.607E-01 | NOT IDENT. |
| AG-108M | 6.414E-03  | 2.918E-02 | 2.543E-02 | 1.489E-02 | NOT IDENT. |
| AG-110M | -9.674E-02 | 4.428E-02 | 3.211E-02 | 2.259E-02 | FAIL ABUN  |
| SN-113  | 7.396E-03  | 4.506E-02 | 3.950E-02 | 2.299E-02 | NOT IDENT. |
| CD-115  | -2.236E+01 | 4.518E+01 | 0.000E+00 | 2.305E+01 | SHORT HLIF |
| SN-117M | -2.999E-04 | 6.127E-02 | 5.407E-02 | 3.126E-02 | NOT IDENT. |
| TE-123M | -1.126E-02 | 2.636E-02 | 2.288E-02 | 1.345E-02 | NOT IDENT. |
| SB-124  | -5.758E-02 | 8.563E-02 | 6.403E-02 | 4.369E-02 | NOT IDENT. |
| SB-125  | 8.005E-02  | 8.960E-02 | 8.102E-02 | 4.571E-02 | FAIL ABUN  |
| TE-125M | 4.249E+00  | 8.391E+00 | 6.966E+00 | 4.281E+00 | NOT IDENT. |
| I-126   | -3.296E-01 | 3.387E-01 | 2.752E-01 | 1.728E-01 | NOT IDENT. |
| SB-126  | 5.804E-02  | 2.426E-01 | 1.852E-01 | 1.238E-01 | NOT IDENT. |
| SB-127  | 2.843E-01  | 3.189E+00 | 2.775E+00 | 1.627E+00 | NOT IDENT. |
| I-131   | 4.500E-02  | 1.620E-01 | 1.439E-01 | 8.265E-02 | NOT IDENT. |
| TE-132  | 1.043E-01  | 1.781E+00 | 1.523E+00 | 9.086E-01 | NOT IDENT. |
| BA-133  | 2.225E-02  | 4.649E-02 | 3.706E-02 | 2.372E-02 | FAIL ABUN  |
| I-133   | 4.439E+04  | 1.925E+05 | 0.000E+00 | 9.823E+04 | SHORT HLIF |
| CS-134  | 1.372E-01  | 7.746E-02 | 5.495E-02 | 3.952E-02 | FAIL ABUN  |
| CS-135  | 2.123E-01  | 1.716E-01 | 1.371E-01 | 8.753E-02 | NOT IDENT. |
| I-135   | 1.773E+20  | 3.790E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -3.307E-02 | 1.413E-01 | 1.195E-01 | 7.210E-02 | NOT IDENT. |
| BA-137M | 3.975E-03  | 4.505E-02 | 4.065E-02 | 2.299E-02 | NOT IDENT. |
| CS-137  | 4.199E-03  | 4.760E-02 | 4.294E-02 | 2.428E-02 | NOT IDENT. |
| CE-139  | -2.209E-02 | 2.624E-02 | 2.222E-02 | 1.339E-02 | NOT IDENT. |
| BA-140  | -2.824E-02 | 3.807E-01 | 3.181E-01 | 1.942E-01 | NOT IDENT. |
| LA-140  | -8.546E-02 | 1.068E-01 | 8.018E-02 | 5.449E-02 | FAIL ABUN  |
| CE-141  | -2.813E-02 | 6.077E-02 | 5.310E-02 | 3.100E-02 | NOT IDENT. |
| CE-143  | 7.318E+03  | 2.225E+03 | 0.000E+00 | 1.135E+03 | SHORT HLIF |
| CE-144  | -3.734E-02 | 1.789E-01 | 1.517E-01 | 9.126E-02 | NOT IDENT. |
| PM-144  | -6.710E-03 | 3.702E-02 | 3.157E-02 | 1.889E-02 | NOT IDENT. |
| PR-144  | -5.360E-01 | 2.775E+00 | 2.364E+00 | 1.416E+00 | NOT IDENT. |
| PM-146  | 4.777E-02  | 4.516E-02 | 4.075E-02 | 2.304E-02 | NOT IDENT. |
| ND-147  | 3.055E-01  | 7.694E-01 | 6.641E-01 | 3.925E-01 | FAIL ABUN  |
| PM-149  | 7.891E+01  | 3.522E+02 | 0.000E+00 | 1.797E+02 | SHORT HLIF |
| EU-152  | 6.032E-03  | 1.003E-01 | 8.228E-02 | 5.118E-02 | NOT IDENT. |
| GD-153  | -6.456E-02 | 6.615E-02 | 5.166E-02 | 3.375E-02 | NOT IDENT. |
| EU-154  | -4.264E-02 | 1.493E-01 | 1.229E-01 | 7.619E-02 | NOT IDENT. |
| TB-160  | -7.404E-02 | 1.634E-01 | 1.321E-01 | 8.338E-02 | FAIL ABUN  |
| HO-166M | -6.677E-03 | 6.603E-02 | 5.648E-02 | 3.369E-02 | FAIL ABUN  |
| TA-182  | -6.833E-02 | 2.608E-01 | 2.043E-01 | 1.330E-01 | FAIL ABUN  |
| IR-192  | 1.261E-01  | 3.398E-02 | 3.067E-02 | 1.734E-02 | FAIL ABUN  |
| HG-203  | 7.963E-03  | 4.783E-02 | 3.590E-02 | 2.440E-02 | NOT IDENT. |
| BI-207  | -1.940E-02 | 6.332E-02 | 5.329E-02 | 3.231E-02 | FAIL ABUN  |
| PB-211  | 1.794E-01  | 7.325E-01 | 6.385E-01 | 3.737E-01 | NOT IDENT. |
| BI-212  | 2.836E+00  | 1.121E+00 | 7.386E-01 | 5.721E-01 | FAIL ABUN  |
| RN-219  | -4.111E-02 | 4.249E-01 | 3.663E-01 | 2.168E-01 | FAIL ABUN  |
| RA-223  | -8.269E-02 | 6.720E-01 | 5.202E-01 | 3.429E-01 | FAIL ABUN  |
| AC-227  | -7.772E-02 | 2.418E-01 | 2.003E-01 | 1.234E-01 | FAIL ABUN  |
| TH-227  | -7.772E-02 | 2.419E-01 | 2.003E-01 | 1.234E-01 | FAIL ABUN  |
| PA-231  | -4.550E-01 | 1.437E+00 | 1.177E+00 | 7.333E-01 | FAIL ABUN  |
| TH-231  | -8.269E-02 | 6.720E-01 | 5.202E-01 | 3.429E-01 | FAIL ABUN  |
| PA-233  | -3.085E-02 | 6.015E-02 | 5.203E-02 | 3.069E-02 | FAIL ABUN  |
| PA-234  | -8.436E-02 | 3.473E-01 | 2.834E-01 | 1.772E-01 | NOT IDENT. |
| PA-234M | 3.324E+00  | 5.439E+00 | 4.720E+00 | 2.775E+00 | FAIL ABUN  |
| NP-239  | -4.344E-01 | 3.158E-01 | 2.680E-01 | 1.611E-01 | FAIL ABUN  |
| AM-241  | -4.756E-02 | 5.611E-02 | 4.293E-02 | 2.863E-02 | NOT IDENT. |
| CM-247  | -1.733E-02 | 3.912E-02 | 3.306E-02 | 1.996E-02 | FAIL ABUN  |
| CF-249  | 1.703E-02  | 3.981E-02 | 3.540E-02 | 2.031E-02 | NOT IDENT. |

|        |            |           |           |                      |
|--------|------------|-----------|-----------|----------------------|
| CF-251 | -3.739E-02 | 1.177E-01 | 1.015E-01 | 6.007E-02 NOT IDENT. |
|--------|------------|-----------|-----------|----------------------|



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*                                     *
*               GEL Laboratories LLC   *
*               2040 SAVAGE ROAD       *
*               CHARLESTON ,SC 29417   *
*               GAMMA SPECTROSCOPY BACKGROUND REPORT *
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| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 358.0305   |
| 49.72  | 347.3348   |
| 57.36  | 0.0000     |
| 59.54  | 535.7161   |
| 63.29  | 521.6570   |
| 63.29  | 521.6570   |
| 64.28  | 523.5529   |
| 67.75  | 532.4067   |
| 69.67  | 630.5590   |
| 70.83  | 567.4054   |
| 72.81  | 583.7785   |
| 72.87  | 583.8955   |
| 72.87  | 583.8955   |
| 74.82  | 587.6544   |
| 74.82  | 587.6544   |
| 74.82  | 587.6544   |
| 74.97  | 587.9412   |
| 77.11  | 592.0096   |
| 77.11  | 592.0096   |
| 77.11  | 592.0096   |
| 79.69  | 596.8365   |
| 79.80  | 597.0403   |
| 80.12  | 597.6329   |
| 80.19  | 597.7612   |
| 80.57  | 598.4632   |
| 81.00  | 599.2557   |
| 81.07  | 599.3840   |
| 81.07  | 599.3840   |
| 83.79  | 360.0018   |
| 83.79  | 360.0018   |
| 85.43  | 361.7621   |
| 86.48  | 362.8794   |
| 86.55  | 362.9536   |
| 86.79  | 363.2054   |
| 86.94  | 363.3672   |
| 87.57  | 364.0327   |
| 88.03  | 364.5160   |
| 88.47  | 364.9791   |
| 89.96  | 366.5348   |
| 91.11  | 367.7286   |
| 92.59  | 373.4276   |
| 92.59  | 373.4276   |
| 93.35  | 374.2143   |
| 94.67  | 375.5739   |
| 94.87  | 375.7785   |
| 94.87  | 375.7785   |
| 95.86  | 374.2614   |
| 97.43  | 403.7789   |
| 98.44  | 334.8418   |
| 99.53  | 339.6375   |
| 100.11 | 353.7953   |
| 103.18 | 345.4442   |
| 103.37 | 345.6119   |
| 105.31 | 349.9091   |
| 106.12 | 350.6218   |
| 109.28 | 328.5068   |
| 111.00 | 375.0094   |
| 111.76 | 386.2309   |
| 116.30 | 338.9442   |
| 117.23 | 374.3578   |
| 121.12 | 320.2882   |
| 121.78 | 305.4912   |
| 122.06 | 312.8757   |
| 123.07 | 352.3311   |
| 131.20 | 359.0861   |
| 133.52 | 359.4638   |
| 136.00 | 352.9862   |

|        |          |
|--------|----------|
| 136.47 | 347.7669 |
| 140.51 | 345.0291 |
| 140.51 | 0.0000   |
| 143.76 | 338.8037 |
| 144.24 | 333.4739 |
| 144.24 | 333.4739 |
| 145.44 | 377.6978 |
| 152.43 | 361.7578 |
| 153.25 | 348.8963 |
| 154.21 | 341.8439 |
| 154.21 | 341.8439 |
| 156.02 | 366.1226 |
| 158.56 | 334.9306 |
| 159.00 | 347.7922 |
| 162.66 | 288.6680 |
| 163.33 | 318.3063 |
| 165.86 | 312.8766 |
| 176.60 | 319.7200 |
| 177.52 | 312.2095 |
| 181.07 | 264.2303 |
| 184.41 | 302.1134 |
| 185.72 | 307.3183 |
| 193.51 | 333.7379 |
| 197.04 | 296.3337 |
| 205.31 | 279.1598 |
| 210.85 | 234.0142 |
| 215.65 | 249.4413 |
| 222.11 | 246.3778 |
| 227.38 | 262.2093 |
| 228.16 | 265.7292 |
| 228.18 | 265.7368 |
| 235.69 | 261.8994 |
| 235.96 | 261.9922 |
| 235.96 | 261.9922 |
| 238.63 | 225.6750 |
| 238.63 | 225.6750 |
| 240.99 | 226.3749 |
| 242.00 | 226.6746 |
| 244.70 | 212.0098 |
| 252.40 | 190.6859 |
| 252.80 | 179.6264 |
| 256.23 | 218.4953 |
| 256.23 | 218.4953 |
| 260.90 | 0.0000   |
| 264.66 | 168.1230 |
| 268.22 | 194.4311 |
| 269.46 | 203.8296 |
| 269.46 | 203.8296 |
| 271.23 | 204.2593 |
| 273.65 | 205.9900 |
| 276.40 | 223.8779 |
| 277.37 | 219.5342 |
| 277.60 | 219.5925 |
| 278.00 | 201.8650 |
| 279.20 | 229.7911 |
| 279.54 | 235.0657 |
| 280.46 | 195.5223 |
| 283.69 | 206.0913 |
| 284.31 | 221.2984 |
| 285.41 | 207.6570 |
| 285.90 | 0.0000   |
| 287.50 | 182.5662 |
| 293.27 | 0.0000   |
| 295.22 | 170.3099 |
| 295.96 | 170.4517 |
| 298.57 | 141.2744 |
| 299.98 | 191.0138 |
| 299.98 | 191.0138 |
| 300.09 | 191.0369 |
| 300.09 | 191.0369 |
| 300.13 | 191.0468 |
| 301.36 | 174.2991 |
| 302.85 | 181.6781 |
| 304.50 | 184.8438 |
| 304.50 | 184.8438 |
| 304.85 | 177.8015 |
| 308.46 | 175.8168 |
| 311.90 | 184.5218 |

|        |          |
|--------|----------|
| 316.51 | 167.4159 |
| 319.41 | 179.6605 |
| 320.08 | 159.0059 |
| 323.87 | 172.6895 |
| 323.87 | 172.6895 |
| 328.76 | 167.7186 |
| 333.37 | 146.5210 |
| 334.37 | 149.6008 |
| 334.37 | 149.6008 |
| 338.28 | 149.0793 |
| 338.28 | 149.0793 |
| 338.32 | 149.0842 |
| 338.32 | 149.0842 |
| 338.32 | 149.0842 |
| 340.48 | 178.5459 |
| 340.55 | 178.5577 |
| 344.28 | 165.3872 |
| 351.06 | 152.8091 |
| 351.93 | 152.9367 |
| 356.01 | 155.7791 |
| 364.49 | 144.3783 |
| 366.42 | 149.3642 |
| 383.85 | 165.1920 |
| 388.16 | 142.6840 |
| 388.63 | 152.3899 |
| 391.69 | 142.1618 |
| 400.66 | 157.8892 |
| 401.81 | 161.9473 |
| 402.40 | 168.8608 |
| 404.85 | 147.6960 |
| 410.95 | 142.5618 |
| 414.70 | 163.7203 |
| 423.72 | 154.0161 |
| 427.09 | 117.5733 |
| 427.87 | 110.6680 |
| 433.94 | 119.2270 |
| 453.88 | 118.0603 |
| 463.37 | 130.1975 |
| 468.07 | 116.8744 |
| 473.00 | 135.2737 |
| 476.78 | 127.3711 |
| 477.60 | 130.5566 |
| 487.02 | 102.2468 |
| 492.35 | 0.0000   |
| 497.08 | 105.0934 |
| 511.00 | 101.8865 |
| 514.00 | 105.5029 |
| 527.90 | 0.0000   |
| 529.87 | 0.0000   |
| 531.02 | 97.9150  |
| 537.26 | 122.1006 |
| 546.56 | 0.0000   |
| 563.25 | 103.3145 |
| 569.33 | 111.4397 |
| 569.50 | 111.4520 |
| 569.70 | 111.4643 |
| 583.19 | 119.0917 |
| 600.60 | 96.3000  |
| 602.73 | 96.1250  |
| 604.72 | 106.7658 |
| 609.32 | 99.5237  |
| 609.32 | 99.5237  |
| 610.33 | 99.5828  |
| 614.28 | 90.7446  |
| 618.01 | 91.8543  |
| 621.93 | 91.1548  |
| 621.93 | 91.1548  |
| 633.25 | 100.0187 |
| 635.95 | 96.4995  |
| 636.99 | 106.6741 |
| 645.85 | 109.0665 |
| 657.76 | 164.7059 |
| 661.66 | 108.1779 |
| 661.66 | 108.1779 |
| 664.57 | 0.0000   |
| 666.33 | 145.8577 |
| 666.50 | 126.2362 |
| 677.62 | 100.6678 |

|         |          |
|---------|----------|
| 685.70  | 100.1669 |
| 695.00  | 105.4175 |
| 696.49  | 100.7492 |
| 696.51  | 100.7518 |
| 697.00  | 115.0386 |
| 702.65  | 98.2197  |
| 706.68  | 105.1177 |
| 711.68  | 96.7711  |
| 720.70  | 102.6823 |
| 721.93  | 0.0000   |
| 722.78  | 109.2189 |
| 722.91  | 109.2272 |
| 723.31  | 114.0692 |
| 724.19  | 123.7652 |
| 727.33  | 94.6647  |
| 733.00  | 74.2727  |
| 735.93  | 81.4980  |
| 739.50  | 75.8139  |
| 747.24  | 80.0141  |
| 752.31  | 106.6289 |
| 753.82  | 89.0894  |
| 756.73  | 95.1007  |
| 763.94  | 80.3527  |
| 765.81  | 98.4814  |
| 766.42  | 103.4363 |
| 777.92  | 92.1304  |
| 778.90  | 82.2644  |
| 783.70  | 70.5337  |
| 785.37  | 73.5736  |
| 795.86  | 69.9453  |
| 801.95  | 83.9279  |
| 810.29  | 81.4904  |
| 810.76  | 75.4706  |
| 815.77  | 73.6291  |
| 818.51  | 59.5848  |
| 832.01  | 101.6211 |
| 834.85  | 93.6127  |
| 836.80  | 0.0000   |
| 846.77  | 59.3353  |
| 856.80  | 71.9346  |
| 860.56  | 74.1129  |
| 871.09  | 71.3550  |
| 873.19  | 64.1751  |
| 875.33  | 0.0000   |
| 879.36  | 78.8797  |
| 880.51  | 79.9571  |
| 883.24  | 73.8133  |
| 884.68  | 59.2961  |
| 889.28  | 81.3040  |
| 898.04  | 81.6105  |
| 911.20  | 57.8682  |
| 911.20  | 57.8682  |
| 911.20  | 57.8682  |
| 926.50  | 63.5347  |
| 937.49  | 74.4604  |
| 944.13  | 70.0926  |
| 946.00  | 76.8551  |
| 949.00  | 76.9500  |
| 962.29  | 82.3792  |
| 964.08  | 87.8136  |
| 966.15  | 66.3639  |
| 968.97  | 79.0079  |
| 968.97  | 79.0079  |
| 968.97  | 79.0079  |
| 983.53  | 80.1877  |
| 996.26  | 91.4792  |
| 1001.03 | 72.0103  |
| 1004.73 | 81.9470  |
| 1037.84 | 65.4676  |
| 1038.76 | 0.0000   |
| 1048.07 | 65.7189  |
| 1050.41 | 62.0710  |
| 1050.41 | 62.0710  |
| 1063.66 | 86.5820  |
| 1085.87 | 91.9787  |
| 1099.45 | 92.4253  |
| 1112.07 | 79.5771  |
| 1115.54 | 91.0586  |

|         |          |
|---------|----------|
| 1120.29 | 92.1610  |
| 1120.29 | 92.1610  |
| 1120.55 | 92.1689  |
| 1121.30 | 92.1926  |
| 1131.51 | 0.0000   |
| 1173.23 | 105.4651 |
| 1177.93 | 78.4951  |
| 1189.05 | 91.4335  |
| 1204.77 | 100.9072 |
| 1221.41 | 95.6897  |
| 1231.02 | 109.4644 |
| 1235.36 | 112.5806 |
| 1238.28 | 97.8600  |
| 1260.41 | 0.0000   |
| 1271.85 | 72.9317  |
| 1274.44 | 73.9910  |
| 1274.54 | 67.9917  |
| 1291.59 | 63.3281  |
| 1298.22 | 0.0000   |
| 1312.11 | 49.5662  |
| 1332.49 | 61.0693  |
| 1365.19 | 43.1655  |
| 1368.63 | 0.0000   |
| 1384.29 | 23.0320  |
| 1408.01 | 46.3796  |
| 1457.56 | 0.0000   |
| 1460.82 | 18.1055  |
| 1489.16 | 23.4162  |
| 1505.03 | 51.3105  |
| 1596.21 | 28.1522  |
| 1620.50 | 24.5491  |
| 1678.03 | 0.0000   |
| 1690.97 | 21.1368  |
| 1764.49 | 9.7771   |
| 1764.49 | 9.7771   |
| 1770.23 | 15.4193  |
| 1771.35 | 13.7095  |
| 1791.20 | 0.0000   |
| 1836.06 | 7.5892   |

TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G247964002

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 7.8406E+00 | ug/g |
| Total Uranium Counting Unc. | 3.1518E+00 | ug/g |
| Total Uranium Tpu           | 1.6081E-06 | ug/g |
| Total Uranium Mda           | 1.2929E+00 | ug/g |

```

*****
*
*               GEL Laboratories LLC               *
*               2040 SAVAGE ROAD                   *
*               CHARLESTON ,SC 29417                *
*               GROSS GAMMA REPORT                  *
*
*****
*
*  BATCH ID      : 958216                          SAMPLE ID   : G247964002
*  ANALYST       : MXR1                             DETECTOR    : GAM25
*  SAMPLE DATE   : 19-FEB-2010 12:00:00.00          COUNT TIME   : 0 02:00:00.00
*  ANALYSIS DATE : 10-MAR-2010 21:17:36.48          SAMPLE ALQT  : 134.670 GRAM
*
*****

```

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GROSS GAMMA ACTIVITY (pCi/GRAM ) : 1.493E+01
GROSS GAMMA ERROR   (pCi/GRAM ) : 1.675E+00
GROSS GAMMA MDA      (pCi/GRAM ) : 4.724E+00
GROSS GAMMA DLC      (pCi/GRAM ) : 2.299E+00

```

## VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 03:09:32.35

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                    *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964003.CNF;1
Sample date        : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:08:59
Sample ID          : G247964003 Sample quantity : 1.32370E+02 GRAM
Detector name      : GAM05 Detector geometry: CAN
Elapsed live time  : 0 04:00:00.00 Elapsed real time: 0 04:00:04.37 0.0%
Energy tolerance   : 1.50000 keV Analyst Initials : MXR1
Abundance limit    : 75.00000 Sensitivity : 5.00000
Batch ID           : 958216 Detector SN# :
Matrix Spike ID    : LCS ID : 1032-A
*****

```

| Pk | It | Energy   | Area | Bkgnd | FWHM  | Channel | Left | Pw | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|-------|---------|------|----|----------|------|----------|
| 1  | 0  | 45.97*   | 466  | 1373  | 1.26  | 92.92   | 88   | 10 | 3.24E-02 | 16.8 |          |
| 2  | 0  | 62.75*   | 338  | 2063  | 1.18  | 126.47  | 123  | 9  | 2.35E-02 | 25.4 |          |
| 3  | 3  | 74.37*   | 2299 | 1921  | 1.44  | 149.72  | 143  | 23 | 1.60E-01 | 4.1  | 4.43E+00 |
| 4  | 3  | 76.66*   | 3425 | 1374  | 1.17  | 154.30  | 143  | 23 | 2.38E-01 | 2.6  |          |
| 5  | 2  | 86.79    | 1172 | 1463  | 1.45  | 174.56  | 165  | 30 | 8.14E-02 | 6.5  | 8.09E-01 |
| 6  | 2  | 89.43    | 668  | 1066  | 1.17  | 179.83  | 165  | 30 | 4.64E-02 | 9.3  |          |
| 7  | 2  | 92.52*   | 1037 | 1405  | 1.63  | 186.02  | 165  | 30 | 7.20E-02 | 8.0  |          |
| 8  | 0  | 104.75   | 155  | 976   | 1.26  | 210.47  | 207  | 8  | 1.07E-02 | 35.9 |          |
| 9  | 0  | 128.28   | 328  | 1426  | 0.91  | 257.53  | 252  | 12 | 2.28E-02 | 23.6 |          |
| 10 | 0  | 185.57*  | 696  | 1242  | 1.17  | 372.09  | 365  | 14 | 4.83E-02 | 11.6 |          |
| 11 | 0  | 209.07   | 359  | 844   | 1.00  | 419.08  | 413  | 10 | 2.50E-02 | 16.0 |          |
| 12 | 3  | 238.28*  | 3782 | 553   | 1.27  | 477.48  | 471  | 18 | 2.63E-01 | 2.0  | 7.73E-01 |
| 13 | 3  | 241.25   | 989  | 632   | 1.85  | 483.42  | 471  | 18 | 6.87E-02 | 7.6  |          |
| 14 | 0  | 269.81   | 309  | 652   | 1.65  | 540.53  | 535  | 12 | 2.14E-02 | 17.5 |          |
| 15 | 0  | 277.42   | 123  | 651   | 1.46  | 555.75  | 550  | 12 | 8.53E-03 | 42.6 |          |
| 16 | 2  | 294.83*  | 1113 | 394   | 1.29  | 590.55  | 584  | 20 | 7.73E-02 | 4.4  | 1.81E+00 |
| 17 | 2  | 299.61   | 290  | 335   | 1.45  | 600.11  | 584  | 20 | 2.01E-02 | 11.9 |          |
| 18 | 0  | 327.75   | 200  | 480   | 1.07  | 656.39  | 652  | 10 | 1.39E-02 | 21.6 |          |
| 19 | 0  | 338.10   | 821  | 541   | 1.42  | 677.07  | 671  | 14 | 5.70E-02 | 7.0  |          |
| 20 | 0  | 351.56*  | 2006 | 616   | 1.50  | 703.98  | 696  | 14 | 1.39E-01 | 3.5  |          |
| 21 | 0  | 407.73   | 174  | 504   | 1.43  | 816.29  | 809  | 15 | 1.21E-02 | 29.1 |          |
| 22 | 0  | 462.10   | 268  | 356   | 1.60  | 924.99  | 917  | 16 | 1.86E-02 | 16.9 |          |
| 23 | 0  | 510.24*  | 433  | 432   | 2.03  | 1021.22 | 1012 | 20 | 3.00E-02 | 13.7 |          |
| 24 | 0  | 582.67*  | 1148 | 255   | 1.42  | 1166.02 | 1158 | 15 | 7.97E-02 | 4.3  |          |
| 25 | 0  | 608.80*  | 1427 | 347   | 1.50  | 1218.25 | 1210 | 16 | 9.91E-02 | 4.0  |          |
| 26 | 0  | 726.61   | 229  | 237   | 1.64  | 1453.74 | 1446 | 13 | 1.59E-02 | 15.3 |          |
| 27 | 0  | 767.98   | 140  | 194   | 1.65  | 1536.41 | 1531 | 12 | 9.70E-03 | 21.8 |          |
| 28 | 0  | 794.55   | 119  | 194   | 1.60  | 1589.52 | 1583 | 13 | 8.25E-03 | 25.9 |          |
| 29 | 0  | 860.69   | 155  | 278   | 1.92  | 1721.71 | 1711 | 21 | 1.07E-02 | 28.4 |          |
| 30 | 0  | 910.78*  | 744  | 169   | 1.71  | 1821.81 | 1816 | 14 | 5.16E-02 | 5.4  |          |
| 31 | 0  | 933.58   | 69   | 152   | 1.76  | 1867.37 | 1860 | 13 | 4.76E-03 | 39.1 |          |
| 32 | 1  | 963.86   | 151  | 135   | 2.19  | 1927.89 | 1920 | 28 | 1.05E-02 | 17.8 | 4.80E-01 |
| 33 | 1  | 968.38*  | 420  | 112   | 1.90  | 1936.93 | 1920 | 28 | 2.92E-02 | 7.3  |          |
| 34 | 0  | 1119.62  | 273  | 165   | 1.74  | 2239.13 | 2233 | 12 | 1.90E-02 | 11.2 |          |
| 35 | 0  | 1238.02  | 82   | 169   | 2.27  | 2475.70 | 2469 | 12 | 5.71E-03 | 33.6 |          |
| 36 | 0  | 1377.87  | 83   | 94    | 1.92  | 2755.09 | 2747 | 16 | 5.77E-03 | 28.9 |          |
| 37 | 0  | 1460.22* | 2679 | 64    | 2.15  | 2919.60 | 2911 | 19 | 1.86E-01 | 2.1  |          |
| 38 | 0  | 1592.08  | 112  | 94    | 10.67 | 3182.98 | 3164 | 33 | 7.80E-03 | 28.5 |          |



| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit |
|----|----|----------|------|-------|------|---------|------|----|----------|------|-----|
| 39 | 0  | 1619.71  | 29   | 21    | 1.51 | 3238.17 | 3230 | 13 | 1.98E-03 | 39.0 |     |
| 40 | 0  | 1728.91  | 70   | 17    | 1.76 | 3456.26 | 3448 | 14 | 4.85E-03 | 17.4 |     |
| 41 | 0  | 1763.84* | 269  | 10    | 2.44 | 3526.02 | 3515 | 20 | 1.87E-02 | 7.0  |     |

Flag: "\*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964003.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8
Sample title      : MXR1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:08:59
Sample ID        : G247964003 Sample quantity : 132.37 GRAM
Sample type       : SOLID Sample geometry :
Detector name     : GAMMA5 Detector geometry: CAN
Elapsed live time: 0 04:00:00.00 Elapsed real time: 0 04:00:04.37 0.0%
Peak Width (FWHM): 3.00 Confidence level : 5.00 %
Energy tolerance : 1.50 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00 WTM error limit : 3.00

```

## Full Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| K-40    | +         | 1460.82      | *   | 3.551E+01           | 2.658E+00 | 5.046E-01      | 3.138E-02 | 70.375  |
| CD-109  | +         | 88.03        | *   | 5.880E+00           | 8.903E-01 | 8.254E-01      | 6.286E-02 | 7.124   |
| SN-126  |           | 64.28        |     | 6.808E-01           | 2.807E-01 | 4.012E-01      | 5.980E-02 | 1.697   |
|         | +         | 86.94        |     | 2.374E+00           | 1.025E+00 | 3.322E-01      | 1.367E-01 | 7.146   |
|         | +         | 87.57        | *   | 5.710E-01           | 8.646E-02 | 8.005E-02      | 6.096E-03 | 7.133   |
| EU-155  | +         | 86.55        |     | 6.936E-01           | 1.054E-01 | 9.694E-02      | 7.493E-03 | 7.154   |
|         | +         | 105.31       | *   | 1.397E-01           | 1.015E-01 | 1.340E-01      | 1.451E-02 | 1.043   |
| TL-208  | +         | 277.37       |     | 6.195E-01           | 5.345E-01 | 5.177E-01      | 6.736E-02 | 1.197   |
|         | +         | 583.19       | *   | 8.469E-01           | 9.629E-02 | 5.338E-02      | 3.921E-03 | 15.865  |
|         | +         | 860.56       |     | 1.103E+00           | 6.357E-01 | 4.195E-01      | 4.257E-02 | 2.629   |
| PB-210  | +         | 46.54        | *   | 2.050E+00           | 7.086E-01 | 6.972E-01      | 5.377E-02 | 2.940   |
| BI-211  |           | 72.87        |     | 2.638E+01           | 3.084E+00 | 3.968E+00      | 3.124E-01 | 6.647   |
|         | +         | 351.06       | *   | 6.257E+00           | 6.598E-01 | 2.976E-01      | 2.359E-02 | 21.023  |
| BI-212  | +         | 727.33       | *   | 2.633E+00           | 8.645E-01 | 7.120E-01      | 8.346E-02 | 3.698   |
|         |           | 785.37       |     | 2.681E+00           | 3.098E+00 | 5.249E+00      | 4.402E-01 | 0.511   |
|         | +         | 1620.50      |     | 2.989E+00           | 2.336E+00 | 3.294E+00      | 1.933E-01 | 0.907   |
| PB-212  | +         | 74.82        |     | 3.943E+00           | 5.911E-01 | 3.286E-01      | 4.104E-02 | 12.000  |
|         | +         | 77.11        |     | 3.543E+00           | 3.330E-01 | 1.984E-01      | 1.545E-02 | 17.852  |
|         | +         | 238.63       | *   | 2.574E+00           | 2.972E-01 | 8.059E-02      | 8.724E-03 | 31.941  |
|         | +         | 300.09       |     | 3.106E+00           | 8.089E-01 | 1.111E+00      | 1.193E-01 | 2.796   |
| BI-214  | +         | 609.32       | *   | 2.047E+00           | 2.382E-01 | 1.033E-01      | 8.719E-03 | 19.811  |
|         | +         | 1120.29      |     | 2.061E+00           | 5.021E-01 | 4.478E-01      | 4.302E-02 | 4.602   |
|         | +         | 1764.49      |     | 2.892E+00           | 4.399E-01 | 2.948E-01      | 1.705E-02 | 9.808   |
| PB-214  | +         | 74.82        |     | 6.990E+00           | 9.709E-01 | 5.825E-01      | 6.492E-02 | 12.000  |
|         | +         | 77.11        |     | 6.246E+00           | 7.810E-01 | 3.499E-01      | 3.967E-02 | 17.852  |
|         | +         | 242.00       |     | 4.085E+00           | 7.725E-01 | 4.775E-01      | 5.425E-02 | 8.556   |
|         | +         | 295.22       |     | 2.110E+00           | 2.997E-01 | 1.985E-01      | 2.201E-02 | 10.627  |
|         | +         | 351.93       | *   | 2.271E+00           | 2.702E-01 | 1.022E-01      | 9.844E-03 | 22.222  |
| RA-224  | +         | 240.99       | *   | 7.224E+00           | 1.300E+00 | 8.639E-01      | 8.452E-02 | 8.362   |
| RA-226  | +         | 609.32       | *   | 2.047E+00           | 2.382E-01 | 1.033E-01      | 8.719E-03 | 19.811  |
|         | +         | 1120.29      |     | 2.061E+00           | 5.021E-01 | 4.478E-01      | 4.302E-02 | 4.602   |
|         | +         | 1764.49      |     | 2.892E+00           | 4.399E-01 | 2.948E-01      | 1.705E-02 | 9.808   |
| AC-228  | +         | 338.32       |     | 2.841E+00           | 1.245E+00 | 3.344E-01      | 1.390E-01 | 8.496   |
|         | +         | 911.20       | *   | 2.705E+00           | 4.494E-01 | 2.147E-01      | 2.725E-02 | 12.600  |

---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| RA-228  | +         | 968.97       |     | 2.637E+00           | 7.543E-01 | 3.602E-01      | 8.873E-02 | 7.319   |
|         | +         | 338.32       |     | 2.841E+00           | 1.245E+00 | 3.344E-01      | 1.390E-01 | 8.496   |
|         | +         | 911.20       | *   | 2.705E+00           | 4.494E-01 | 2.147E-01      | 2.725E-02 | 12.600  |
| TH-228  | +         | 968.97       |     | 2.637E+00           | 7.543E-01 | 3.602E-01      | 8.873E-02 | 7.319   |
|         | +         | 74.82        |     | 3.943E+00           | 4.520E-01 | 3.286E-01      | 2.601E-02 | 12.000  |
|         | +         | 77.11        |     | 3.543E+00           | 3.330E-01 | 1.984E-01      | 1.545E-02 | 17.852  |
|         | +         | 238.63       | *   | 2.574E+00           | 2.972E-01 | 8.059E-02      | 8.724E-03 | 31.941  |
| TH-229  | +         | 300.09       |     | 3.106E+00           | 2.040E+00 | 1.111E+00      | 6.804E-01 | 2.796   |
|         | +         | 85.43        |     | 1.437E+00           | 2.176E-01 | 2.003E-01      | 1.531E-02 | 7.177   |
|         | +         | 88.47        |     | 5.048E-01           | 1.023E-01 | 1.237E-01      | 9.515E-03 | 4.079   |
|         |           | 193.51       | *   | -1.274E-01          | 4.847E-01 | 7.705E-01      | 7.695E-02 | -0.165  |
| TH-232  |           | 210.85       |     | 2.822E+00           | 9.712E-01 | 1.433E+00      | 1.428E-01 | 1.970   |
|         | +         | 338.32       |     | 2.841E+00           | 4.538E-01 | 3.344E-01      | 2.621E-02 | 8.496   |
|         | +         | 911.20       | *   | 2.705E+00           | 4.494E-01 | 2.147E-01      | 2.725E-02 | 12.600  |
|         | +         | 968.97       |     | 2.637E+00           | 7.543E-01 | 3.602E-01      | 8.873E-02 | 7.319   |
| TH-234  | +         | 63.29        | *   | 1.608E+00           | 8.681E-01 | 9.375E-01      | 1.701E-01 | 1.715   |
|         | +         | 92.59        |     | 4.480E+00           | 1.221E+00 | 7.110E-01      | 1.564E-01 | 6.301   |
| U-235   | +         | 89.96        |     | 3.491E+00           | 1.072E+00 | 8.597E-01      | 2.096E-01 | 4.061   |
|         | +         | 93.35        |     | 3.384E+00           | 9.500E-01 | 5.384E-01      | 1.242E-01 | 6.286   |
|         |           | 143.76       | *   | 2.654E-01           | 1.894E-01 | 3.049E-01      | 5.817E-02 | 0.870   |
|         |           | 163.33       |     | 2.236E-02           | 3.954E-01 | 6.380E-01      | 1.198E-01 | 0.035   |
| NP-237  | +         | 185.72       |     | 3.043E-01           | 7.710E-02 | 5.737E-02      | 5.725E-03 | 5.305   |
|         |           | 205.31       |     | 3.348E-02           | 5.010E-01 | 6.994E-01      | 1.317E-01 | 0.048   |
|         | +         | 86.48        | *   | 1.704E+00           | 4.407E-01 | 2.381E-01      | 5.313E-02 | 7.156   |
|         |           | 95.86        |     | -3.252E-01          | 7.753E-01 | 1.093E+00      | 2.637E-01 | -0.298  |
| U-238   | +         | 63.29        | *   | 1.608E+00           | 8.681E-01 | 9.375E-01      | 1.701E-01 | 1.715   |
|         | +         | 92.59        |     | 4.480E+00           | 8.125E-01 | 7.110E-01      | 5.975E-02 | 6.301   |
| ANH-511 | +         | 511.00       | *   | 2.409E-01           | 6.789E-02 | 3.987E-02      | 2.552E-03 | 6.042   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| BE-7    |           | 477.60       | *   | -4.677E-02          | 3.427E-01 | 5.194E-01           | 3.720E-02 | -0.090  |
| NA-22   |           | 1274.54      | *   | -1.394E-02          | 4.370E-02 | 6.931E-02           | 4.037E-03 | -0.201  |
| NA-24   |           | 1368.63      | *   | -3.145E+01          | 4.370E-02 | Half-Life too short |           |         |
| SC-46   |           | 889.28       | *   | -9.391E-03          | 3.644E-02 | 5.935E-02           | 5.961E-03 | -0.158  |
|         | +         | 1120.55      |     | 3.615E-01           | 8.467E-02 | 1.305E-01           | 8.974E-03 | 2.771   |
| V-48    |           | 944.13       |     | -3.670E-01          | 1.007E+00 | 1.625E+00           | 1.571E-01 | -0.226  |
|         |           | 983.53       | *   | -5.395E-02          | 7.909E-02 | 1.244E-01           | 1.140E-02 | -0.434  |
|         |           | 1312.11      |     | 1.670E-02           | 8.989E-02 | 1.472E-01           | 8.533E-03 | 0.113   |
| CR-51   |           | 320.08       | *   | 8.242E-02           | 3.672E-01 | 6.144E-01           | 5.429E-02 | 0.134   |
| MN-54   |           | 834.85       | *   | -9.066E-03          | 3.685E-02 | 6.044E-02           | 5.537E-03 | -0.150  |
| CO-56   |           | 846.77       | *   | 1.439E-02           | 3.623E-02 | 6.137E-02           | 5.740E-03 | 0.234   |
|         |           | 1037.84      |     | 2.051E-01           | 3.055E-01 | 5.193E-01           | 4.576E-02 | 0.395   |
|         | +         | 1238.28      |     | 1.800E-01           | 1.215E-01 | 1.624E-01           | 1.003E-02 | 1.108   |
|         |           | 1771.35      |     | 1.108E-02           | 2.015E-01 | 2.866E-01           | 1.655E-02 | 0.039   |
| CO-57   |           | 122.06       | *   | -4.605E-03          | 2.347E-02 | 3.507E-02           | 4.975E-03 | -0.131  |
|         |           | 136.47       |     | 2.032E-02           | 1.880E-01 | 3.054E-01           | 4.089E-02 | 0.067   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| CO-58   | 810.76    | *            |     | -6.115E-02          | 3.753E-02 | 5.612E-02           | 4.939E-03 | -1.090  |
| FE-59   | 1099.45   | *            |     | -8.819E-02          | 9.909E-02 | 1.533E-01           | 1.241E-02 | -0.575  |
|         | 1291.59   |              |     | -6.116E-02          | 1.207E-01 | 1.879E-01           | 1.396E-02 | -0.325  |
| CO-60   | 1173.23   |              |     | 1.632E-02           | 4.468E-02 | 7.414E-02           | 4.300E-03 | 0.220   |
|         | 1332.49   | *            |     | 2.136E-02           | 3.595E-02 | 6.065E-02           | 3.510E-03 | 0.352   |
| ZN-65   | 1115.54   | *            |     | 4.040E-02           | 1.029E-01 | 1.483E-01           | 1.036E-02 | 0.272   |
| SE-75   | 121.12    |              |     | 5.420E-03           | 1.144E-01 | 1.862E-01           | 2.909E-02 | 0.029   |
|         | 136.00    |              |     | 2.172E-02           | 3.641E-02 | 5.965E-02           | 7.780E-03 | 0.364   |
|         | 264.66    | *            |     | 2.324E-02           | 4.445E-02 | 6.609E-02           | 6.310E-03 | 0.352   |
|         | 279.54    |              |     | 7.539E-02           | 1.090E-01 | 1.626E-01           | 1.558E-02 | 0.464   |
|         | 400.66    |              |     | 8.365E-02           | 2.730E-01 | 3.954E-01           | 3.605E-02 | 0.212   |
| SR-85   | 514.00    | *            |     | 8.304E-02           | 3.997E-02 | 6.260E-02           | 4.012E-03 | 1.327   |
| Y-88    | 898.04    |              |     | 1.164E-02           | 4.031E-02 | 6.766E-02           | 6.918E-03 | 0.172   |
|         | 1836.06   | *            |     | 1.612E-02           | 2.975E-02 | 5.222E-02           | 2.988E-03 | 0.309   |
| Y-91    | 1204.77   | *            |     | 2.755E+00           | 2.259E+01 | 3.693E+01           | 2.146E+00 | 0.075   |
| NB-94   | 702.65    | *            |     | 3.534E-02           | 3.287E-02 | 5.733E-02           | 4.102E-03 | 0.616   |
|         | 871.09    |              |     | 1.421E-02           | 3.368E-02 | 5.582E-02           | 5.440E-03 | 0.255   |
| NB-95   | 765.81    | *            |     | 8.517E-02           | 5.193E-02 | 8.126E-02           | 6.572E-03 | 1.048   |
| NB-95M  | 235.69    | *            |     | 1.633E+00           | 2.400E-01 | 2.936E-01           | 3.216E-02 | 5.562   |
| ZR-95   | 724.19    |              |     | 2.395E-01           | 1.192E-01 | 1.885E-01           | 1.564E-02 | 1.271   |
|         | 756.73    | *            |     | 1.976E-03           | 7.427E-02 | 1.241E-01           | 1.107E-02 | 0.016   |
| MO-99   | 140.51    |              |     | -5.102E+01          | 6.175E+01 | 9.582E+01           | 2.439E+01 | -0.532  |
|         | 181.07    |              |     | 1.664E+01           | 5.403E+01 | 7.639E+01           | 1.486E+01 | 0.218   |
|         | 366.42    |              |     | 1.837E+02           | 2.657E+02 | 4.494E+02           | 3.084E+01 | 0.409   |
|         | 739.50    | *            |     | 7.223E-01           | 3.531E+01 | 5.905E+01           | 9.017E+00 | 0.012   |
|         | 777.92    |              |     | -5.024E+01          | 1.028E+02 | 1.670E+02           | 1.382E+01 | -0.301  |
| TC-99M  | 140.51    | *            |     | -5.339E+15          | 1.028E+02 | Half-Life too short |           |         |
| RU-103  | 497.08    | *            |     | 5.718E-03           | 3.979E-02 | 6.523E-02           | 8.280E-03 | 0.088   |
|         | 610.33    |              |     | 2.208E+01           | 3.697E+00 | 3.009E+00           | 4.626E-01 | 7.338   |
| RH-106  | 621.93    | *            |     | 2.754E-01           | 3.055E-01 | 5.106E-01           | 6.146E-02 | 0.539   |
|         | 1050.41   |              |     | 3.510E-01           | 2.588E+00 | 4.272E+00           | 3.478E-01 | 0.082   |
| RU-106  | 621.93    | *            |     | 2.754E-01           | 3.042E-01 | 5.106E-01           | 3.366E-02 | 0.539   |
|         | 1050.41   |              |     | 3.510E-01           | 2.588E+00 | 4.272E+00           | 3.478E-01 | 0.082   |
| AG-108M | 433.94    | *            |     | -1.814E-02          | 2.692E-02 | 4.290E-02           | 2.770E-03 | -0.423  |
|         | 614.28    |              |     | 2.544E-02           | 3.755E-02 | 5.453E-02           | 3.793E-03 | 0.466   |
|         | 722.91    |              |     | 7.386E-03           | 4.149E-02 | 6.054E-02           | 4.703E-03 | 0.122   |
| AG-110M | 657.76    | *            |     | 1.442E-02           | 3.361E-02 | 5.511E-02           | 3.810E-03 | 0.262   |
|         | 677.62    |              |     | -1.302E-03          | 2.932E-01 | 4.920E-01           | 3.499E-02 | -0.003  |
|         | 706.68    |              |     | 6.034E-02           | 2.078E-01 | 3.523E-01           | 2.645E-02 | 0.171   |
|         | 763.94    |              |     | 1.748E-03           | 1.802E-01 | 2.591E-01           | 2.154E-02 | 0.007   |
|         | 884.68    |              |     | -3.181E-02          | 4.502E-02 | 7.121E-02           | 7.269E-03 | -0.447  |
|         | 937.49    |              |     | 7.001E-02           | 1.194E-01 | 1.771E-01           | 1.776E-02 | 0.395   |
|         | 1384.29   |              |     | -2.458E-03          | 1.624E-01 | 2.324E-01           | 1.433E-02 | -0.011  |
|         | 1505.03   |              |     | -4.360E-02          | 2.561E-01 | 4.202E-01           | 2.470E-02 | -0.104  |
| SN-113  | 391.69    | *            |     | -2.340E-03          | 4.177E-02 | 6.867E-02           | 4.260E-03 | -0.034  |
| CD-115  | 260.90    |              |     | -2.757E-04          | 4.177E-02 | Half-Life too short |           |         |
|         | 492.35    |              |     | -9.840E-05          | 4.177E-02 | Half-Life too short |           |         |
|         | 527.90    | *            |     | -4.803E-06          | 4.177E-02 | Half-Life too short |           |         |
| SN-117M | 156.02    |              |     | -8.016E-01          | 2.619E+00 | 4.193E+00           | 4.624E-01 | -0.191  |

---- Non-Identified Nuclides ----

| Nuclide           | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|-------------------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TE-123M<br>SB-124 | 158.56    | *            |     | -4.773E-02          | 6.272E-02 | 9.889E-02      | 1.063E-02 | -0.483  |
|                   | 159.00    | *            |     | -1.513E-02          | 2.661E-02 | 4.223E-02      | 4.537E-03 | -0.358  |
|                   | 602.73    |              |     | -2.443E-02          | 4.249E-02 | 5.663E-02      | 3.730E-03 | -0.431  |
|                   | 645.85    |              |     | -2.939E-01          | 5.069E-01 | 7.900E-01      | 5.707E-02 | -0.372  |
| SB-125            | 722.78    |              |     | 8.306E-02           | 4.341E-01 | 6.340E-01      | 4.867E-02 | 0.131   |
|                   | 1690.97   | *            |     | 7.904E-03           | 6.501E-02 | 1.090E-01      | 6.933E-03 | 0.072   |
|                   | 427.87    | *            |     | -6.007E-02          | 8.368E-02 | 1.333E-01      | 8.345E-03 | -0.451  |
|                   | 463.37    |              |     | 1.310E+00           | 4.526E-01 | 4.846E-01      | 3.434E-02 | 2.703   |
| TE-125M<br>I-126  | 600.60    |              |     | -8.645E-02          | 1.826E-01 | 2.584E-01      | 1.912E-02 | -0.335  |
|                   | 635.95    |              |     | -4.386E-02          | 2.749E-01 | 4.389E-01      | 3.284E-02 | -0.100  |
|                   | 109.28    | *            |     | 4.932E-01           | 9.517E+00 | 1.326E+01      | 1.722E+00 | 0.037   |
|                   | 388.63    |              |     | 9.341E-02           | 1.990E-01 | 3.331E-01      | 1.982E-02 | 0.280   |
| SB-126            | 666.33    | *            |     | 2.085E-01           | 2.671E-01 | 4.447E-01      | 2.953E-02 | 0.469   |
|                   | 753.82    |              |     | 1.644E+00           | 2.201E+00 | 3.794E+00      | 3.000E-01 | 0.433   |
|                   | 414.70    |              |     | -8.386E-02          | 1.050E-01 | 1.428E-01      | 8.506E-03 | -0.587  |
|                   | 666.50    |              |     | 6.949E-02           | 9.257E-02 | 1.539E-01      | 1.022E-02 | 0.452   |
| SB-127            | 695.00    |              |     | 8.784E-02           | 1.060E-01 | 1.618E-01      | 1.140E-02 | 0.543   |
|                   | 697.00    |              |     | 5.190E-02           | 3.270E-01 | 5.518E-01      | 3.903E-02 | 0.094   |
|                   | 720.70    | *            |     | 5.310E-02           | 2.033E-01 | 2.983E-01      | 2.212E-02 | 0.178   |
|                   | 856.80    |              |     | 9.590E-01           | 6.645E-01 | 1.038E+00      | 9.871E-02 | 0.924   |
| I-131             | 252.40    |              |     | 5.023E+00           | 8.281E+00 | 1.366E+01      | 5.760E+00 | 0.368   |
|                   | 473.00    |              |     | 9.710E-01           | 3.318E+00 | 5.483E+00      | 6.960E-01 | 0.177   |
|                   | 685.70    | *            |     | 1.348E+00           | 2.615E+00 | 4.483E+00      | 5.229E-01 | 0.301   |
|                   | 783.70    |              |     | 8.245E+00           | 7.432E+00 | 1.287E+01      | 1.735E+00 | 0.640   |
| TE-132            | 80.19     |              |     | -5.251E+00          | 4.822E+00 | 6.747E+00      | 5.282E-01 | -0.778  |
|                   | 284.31    |              |     | -1.229E+00          | 1.981E+00 | 3.049E+00      | 2.938E-01 | -0.403  |
|                   | 364.49    | *            |     | 7.861E-02           | 1.525E-01 | 2.564E-01      | 1.935E-02 | 0.307   |
|                   | 636.99    |              |     | -2.470E-01          | 2.301E+00 | 3.681E+00      | 2.676E-01 | -0.067  |
| BA-133            | 49.72     |              |     | -1.668E+01          | 9.775E+00 | 1.336E+01      | 1.512E+00 | -1.248  |
|                   | 111.76    |              |     | -5.150E+01          | 6.979E+01 | 1.112E+02      | 1.658E+01 | -0.463  |
|                   | 116.30    |              |     | 2.162E+01           | 6.271E+01 | 1.028E+02      | 1.611E+01 | 0.210   |
|                   | 228.16    | *            |     | 3.557E-01           | 1.658E+00 | 2.804E+00      | 4.894E-01 | 0.127   |
| I-133             | 81.00     |              |     | 7.518E-02           | 8.868E-02 | 9.517E-02      | 1.431E-02 | 0.790   |
|                   | 276.40    |              |     | 5.730E-01           | 4.958E-01 | 5.431E-01      | 7.904E-02 | 1.055   |
|                   | 302.85    |              |     | -3.381E-03          | 1.390E-01 | 2.010E-01      | 2.651E-02 | -0.017  |
|                   | 356.01    | *            |     | 2.081E-02           | 4.137E-02 | 6.079E-02      | 7.345E-03 | 0.342   |
| CS-134            | 383.85    |              |     | 1.694E-01           | 2.733E-01 | 4.594E-01      | 4.990E-02 | 0.369   |
|                   | 529.87    | *            |     | -2.059E-01          | 2.733E-01 | Half-Life      | too short |         |
|                   | 875.33    |              |     | 6.349E-01           | 2.733E-01 | Half-Life      | too short |         |
|                   | 1298.22   |              |     | 5.088E-02           | 2.733E-01 | Half-Life      | too short |         |
| I-135             | 563.25    |              |     | 3.965E-01           | 3.511E-01 | 5.795E-01      | 3.850E-02 | 0.684   |
|                   | 569.33    |              |     | -1.374E-01          | 1.955E-01 | 2.955E-01      | 1.980E-02 | -0.465  |
|                   | 604.72    |              |     | 1.530E-02           | 3.477E-02 | 4.979E-02      | 3.293E-03 | 0.307   |
|                   | 795.86    | *            |     | 1.306E-01           | 6.856E-02 | 8.750E-02      | 7.535E-03 | 1.492   |
| CS-135            | 801.95    |              |     | -6.138E-01          | 4.311E-01 | 5.936E-01      | 5.160E-02 | -1.034  |
|                   | 1365.19   |              |     | 4.968E-01           | 1.106E+00 | 1.850E+00      | 1.182E-01 | 0.268   |
|                   | 268.22    | *            |     | 4.141E-01           | 1.694E-01 | 2.602E-01      | 2.784E-02 | 1.591   |
|                   | 546.56    |              |     | 8.294E+14           | 1.694E-01 | Half-Life      | too short |         |
| I-135             | 836.80    |              |     | 2.587E+15           | 1.694E-01 | Half-Life      | too short |         |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         | 1038.76   |              |     | 8.363E+14           | 1.694E-01 | Half-Life      | too short |         |
|         | 1131.51   |              |     | 1.562E+14           | 1.694E-01 | Half-Life      | too short |         |
|         | 1260.41   | *            |     | -2.414E+13          | 1.694E-01 | Half-Life      | too short |         |
|         | 1457.56   |              |     | 9.454E+16           | 1.694E-01 | Half-Life      | too short |         |
|         | 1678.03   |              |     | 1.871E+14           | 1.694E-01 | Half-Life      | too short |         |
|         | 1791.20   |              |     | -3.341E+13          | 1.694E-01 | Half-Life      | too short |         |
| CS-136  | 153.25    |              |     | 1.782E+00           | 1.008E+00 | 1.653E+00      | 2.087E-01 | 1.078   |
|         | 176.60    |              |     | -4.490E-01          | 5.602E-01 | 8.773E-01      | 9.425E-02 | -0.512  |
|         | 273.65    |              |     | -3.582E-01          | 9.380E-01 | 8.860E-01      | 8.907E-02 | -0.404  |
|         | 340.55    |              |     | 7.909E-01           | 2.035E-01 | 3.234E-01      | 2.631E-02 | 2.446   |
|         | 818.51    |              |     | 6.693E-02           | 8.719E-02 | 1.503E-01      | 1.340E-02 | 0.445   |
|         | 1048.07   | *            |     | 6.608E-03           | 1.319E-01 | 2.167E-01      | 1.857E-02 | 0.030   |
|         | 1235.36   |              |     | 7.487E-01           | 8.776E-01 | 1.285E+00      | 1.272E-01 | 0.583   |
| BA-137M | 661.66    | *            |     | -1.310E-02          | 3.502E-02 | 5.515E-02      | 3.627E-03 | -0.238  |
| CS-137  | 661.66    | *            |     | -1.384E-02          | 3.699E-02 | 5.826E-02      | 3.844E-03 | -0.238  |
| CE-139  | 165.86    | *            |     | 1.655E-03           | 2.778E-02 | 4.480E-02      | 4.447E-03 | 0.037   |
| BA-140  | 162.66    |              |     | -1.264E-01          | 9.392E-01 | 1.508E+00      | 1.627E-01 | -0.084  |
|         | 304.85    |              |     | 3.454E-01           | 1.616E+00 | 2.463E+00      | 7.220E-01 | 0.140   |
|         | 423.72    |              |     | 1.577E+00           | 2.318E+00 | 3.811E+00      | 1.231E+00 | 0.414   |
|         | 537.26    | *            |     | 1.124E-01           | 3.176E-01 | 5.201E-01      | 1.739E-01 | 0.216   |
| LA-140  | 328.76    | +            |     | 1.084E+00           | 4.787E-01 | 6.641E-01      | 5.744E-02 | 1.633   |
|         | 487.02    |              |     | 2.220E-01           | 1.661E-01 | 2.846E-01      | 1.999E-02 | 0.780   |
|         | 815.77    |              |     | 1.467E-01           | 3.712E-01 | 6.297E-01      | 6.199E-02 | 0.233   |
|         | 1596.21   | *            |     | 1.410E-01           | 1.001E-01 | 1.698E-01      | 9.977E-03 | 0.831   |
| CE-141  | 145.44    | *            |     | 4.342E-02           | 6.303E-02 | 1.032E-01      | 1.262E-02 | 0.421   |
| CE-143  | 57.36     |              |     | 6.564E-05           | 6.303E-02 | Half-Life      | too short |         |
|         | 293.27    | *            |     | 1.506E-02           | 6.303E-02 | Half-Life      | too short |         |
|         | 664.57    |              |     | 1.476E-03           | 6.303E-02 | Half-Life      | too short |         |
|         | 721.93    |              |     | -3.708E-03          | 6.303E-02 | Half-Life      | too short |         |
| CE-144  | 80.12     |              |     | -1.904E+00          | 1.802E+00 | 2.525E+00      | 1.951E-01 | -0.754  |
|         | 133.52    | *            |     | -9.243E-02          | 2.055E-01 | 2.861E-01      | 5.230E-02 | -0.323  |
| PM-144  | 476.78    |              |     | -6.437E-02          | 6.690E-02 | 9.766E-02      | 7.094E-03 | -0.659  |
|         | 618.01    |              |     | -2.984E-02          | 3.134E-02 | 4.800E-02      | 3.315E-03 | -0.622  |
|         | 696.49    | *            |     | 4.303E-03           | 3.271E-02 | 5.512E-02      | 3.899E-03 | 0.078   |
| PR-144  | 696.51    | *            |     | 3.251E-01           | 2.453E+00 | 4.135E+00      | 2.922E-01 | 0.079   |
|         | 1489.16   |              |     | -7.081E+00          | 1.113E+01 | 1.741E+01      | 1.023E+00 | -0.407  |
| PM-146  | 453.88    | *            |     | 4.142E-02           | 4.118E-02 | 6.418E-02      | 5.592E-03 | 0.645   |
|         | 633.25    |              |     | 4.736E-01           | 1.438E+00 | 2.332E+00      | 8.813E-01 | 0.203   |
|         | 735.93    |              |     | 7.044E-02           | 1.344E-01 | 2.279E-01      | 6.322E-02 | 0.309   |
|         | 747.24    |              |     | -2.790E-02          | 9.023E-02 | 1.483E-01      | 2.093E-02 | -0.188  |
| ND-147  | 91.11     | +            |     | 2.333E+00           | 4.313E-01 | 5.360E-01      | 4.771E-02 | 4.353   |
|         | 319.41    |              |     | 1.769E+00           | 3.921E+00 | 6.606E+00      | 5.544E-01 | 0.268   |
|         | 531.02    | *            |     | -5.729E-01          | 7.068E-01 | 1.098E+00      | 1.517E-01 | -0.522  |
| PM-149  | 285.90    | *            |     | 6.862E-05           | 7.068E-01 | Half-Life      | too short |         |
| EU-152  | 121.78    |              |     | 1.434E-02           | 6.643E-02 | 1.004E-01      | 1.501E-02 | 0.143   |
|         | 244.70    |              |     | 5.139E-01           | 2.994E-01 | 4.615E-01      | 4.500E-02 | 1.113   |
|         | 344.28    | *            |     | -8.527E-02          | 1.567E-01 | 1.427E-01      | 1.173E-02 | -0.597  |
|         | 778.90    |              |     | -1.145E-01          | 2.414E-01 | 3.924E-01      | 3.252E-02 | -0.292  |
|         | 964.08    | +            |     | 1.020E+00           | 3.762E-01 | 5.432E-01      | 5.117E-02 | 1.878   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Activity Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|--------------|---------------------|-----------|----------------|-----------|---------|
| GD-153  |           | 1085.87      |              | -1.432E-01          | 4.031E-01 | 6.247E-01      | 4.703E-02 | -0.229  |
|         |           | 1112.07      |              | -3.444E-02          | 3.437E-01 | 4.975E-01      | 3.503E-02 | -0.069  |
|         |           | 1408.01      |              | 2.497E-01           | 1.735E-01 | 3.171E-01      | 1.853E-02 | 0.787   |
|         |           | 69.67        |              | -1.201E+00          | 1.061E+00 | 1.490E+00      | 1.185E-01 | -0.806  |
| EU-154  |           | 97.43        | *            | 1.075E-01           | 7.253E-02 | 1.077E-01      | 9.979E-03 | 0.999   |
|         |           | 103.18       |              | -2.804E-02          | 1.032E-01 | 1.464E-01      | 1.514E-02 | -0.191  |
|         |           | 123.07       |              | -2.706E-02          | 5.061E-02 | 7.044E-02      | 1.122E-02 | -0.384  |
|         |           | 723.31       |              | 5.169E-02           | 1.953E-01 | 2.863E-01      | 2.419E-02 | 0.181   |
| TB-160  |           | 873.19       |              | 4.369E-03           | 2.758E-01 | 4.571E-01      | 5.832E-02 | 0.010   |
|         |           | 996.26       |              | -1.977E-01          | 3.312E-01 | 5.217E-01      | 9.208E-02 | -0.379  |
|         |           | 1004.73      |              | -3.520E-02          | 2.086E-01 | 3.394E-01      | 4.010E-02 | -0.104  |
|         |           | 1274.44      | *            | -3.940E-02          | 1.236E-01 | 1.959E-01      | 1.848E-02 | -0.201  |
| HO-166M | +         | 86.79        |              | 1.916E+00           | 2.901E-01 | 3.851E-01      | 2.936E-02 | 4.976   |
|         |           | 197.04       |              | -4.097E-01          | 5.687E-01 | 8.557E-01      | 8.545E-02 | -0.479  |
|         |           | 215.65       |              | 4.963E-02           | 6.613E-01 | 1.117E+00      | 1.111E-01 | 0.044   |
|         | +         | 298.57       |              | 4.562E-01           | 1.155E-01 | 1.959E-01      | 1.743E-02 | 2.329   |
| TA-182  |           | 879.36       | *            | -2.088E-03          | 1.331E-01 | 2.202E-01      | 2.175E-02 | -0.009  |
|         |           | 962.29       |              | 1.722E+00           | 6.147E-01 | 1.006E+00      | 9.504E-02 | 1.711   |
|         |           | 966.15       |              | 2.170E+00           | 3.374E-01 | 5.580E-01      | 5.242E-02 | 3.889   |
|         |           | 1177.93      |              | -3.918E-02          | 3.917E-01 | 6.338E-01      | 3.678E-02 | -0.062  |
| IR-192  |           | 1271.85      |              | 1.860E-01           | 7.230E-01 | 1.189E+00      | 6.912E-02 | 0.156   |
|         | +         | 80.57        |              | 2.188E-01           | 2.500E-01 | 2.702E-01      | 2.086E-02 | 0.810   |
|         |           | 184.41       |              | 2.418E-01           | 6.126E-02 | 6.180E-02      | 6.166E-03 | 3.913   |
|         |           | 280.46       |              | -2.798E-02          | 8.247E-02 | 1.180E-01      | 1.092E-02 | -0.237  |
| HG-203  |           | 410.95       |              | 3.958E-01           | 2.654E-01 | 4.045E-01      | 2.401E-02 | 0.979   |
|         |           | 711.68       | *            | -5.737E-04          | 5.734E-02 | 9.596E-02      | 6.991E-03 | -0.006  |
|         |           | 752.31       |              | 1.126E-01           | 2.591E-01 | 4.410E-01      | 3.478E-02 | 0.255   |
|         |           | 810.29       |              | -8.475E-02          | 5.353E-02 | 8.024E-02      | 7.040E-03 | -1.056  |
| BI-207  |           | 67.75        |              | -4.801E-02          | 7.853E-02 | 9.400E-02      | 7.525E-03 | -0.511  |
|         |           | 100.11       |              | 2.885E-02           | 1.902E-01 | 2.307E-01      | 2.252E-02 | 0.125   |
|         |           | 152.43       |              | 3.013E-01           | 3.294E-01 | 5.405E-01      | 6.165E-02 | 0.558   |
|         |           | 222.11       |              | -9.803E-02          | 3.109E-01 | 5.195E-01      | 5.152E-02 | -0.189  |
| PB-211  |           | 1121.30      |              | 1.071E+00           | 2.086E-01 | 3.581E-01      | 2.458E-02 | 2.990   |
|         |           | 1189.05      |              | 2.113E-01           | 3.300E-01 | 5.539E-01      | 3.216E-02 | 0.381   |
|         |           | 1221.41      | *            | -4.238E-03          | 2.145E-01 | 3.478E-01      | 2.022E-02 | -0.012  |
|         |           | 1231.02      |              | 9.115E-02           | 5.776E-01 | 8.109E-01      | 4.715E-02 | 0.112   |
| TA-182  | +         | 295.96       |              | 1.626E+00           | 2.059E-01 | 2.696E-01      | 2.431E-02 | 6.029   |
|         |           | 308.46       |              | 1.986E-02           | 8.960E-02 | 1.501E-01      | 1.308E-02 | 0.132   |
|         |           | 316.51       | *            | -1.305E-02          | 3.191E-02 | 5.231E-02      | 4.440E-03 | -0.249  |
|         |           | 468.07       |              | -2.999E-03          | 7.255E-02 | 1.023E-01      | 7.236E-03 | -0.029  |
| BI-207  |           | 70.83        |              | 1.523E-01           | 8.757E-01 | 1.273E+00      | 1.998E-01 | 0.120   |
|         |           | 72.87        |              | 7.010E+00           | 1.222E+00 | 1.055E+00      | 1.596E-01 | 6.647   |
|         |           | 279.20       | *            | 4.645E-02           | 4.027E-02 | 6.098E-02      | 5.784E-03 | 0.762   |
|         | +         | 72.81        |              | 1.479E+00           | 1.750E-01 | 2.268E-01      | 1.786E-02 | 6.519   |
| PB-211  |           | 74.97        |              | 1.137E+00           | 1.296E-01 | 1.813E-01      | 1.419E-02 | 6.270   |
|         |           | 569.70       |              | -1.869E-02          | 3.017E-02 | 4.580E-02      | 2.998E-03 | -0.408  |
|         |           | 1063.66      | *            | -4.629E-03          | 5.130E-02 | 8.355E-02      | 6.616E-03 | -0.055  |
|         |           | 1770.23      |              | 1.205E-01           | 3.643E-01 | 5.494E-01      | 3.173E-02 | 0.219   |
|         |           | 404.85       | *            | 2.930E-01           | 7.673E-01 | 1.097E+00      | 5.263E-01 | 0.267   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         |           | 427.09       |     | -4.481E-01          | 1.411E+00 | 2.263E+00      | 1.037E+00 | -0.198  |
|         |           | 832.01       |     | -4.113E-01          | 9.856E-01 | 1.564E+00      | 8.121E-01 | -0.263  |
| RN-219  | +         | 271.23       |     | 9.307E-01           | 3.417E-01 | 3.934E-01      | 4.299E-02 | 2.366   |
|         |           | 401.81       | *   | 1.322E-01           | 4.183E-01 | 6.059E-01      | 8.163E-02 | 0.218   |
| RA-223  |           | 81.07        |     | 1.760E-01           | 1.998E-01 | 2.160E-01      | 1.666E-02 | 0.815   |
|         |           | 83.79        |     | 3.670E-01           | 9.439E-02 | 1.420E-01      | 1.089E-02 | 2.583   |
|         |           | 94.87        |     | 8.989E-01           | 3.948E-01 | 5.892E-01      | 5.189E-02 | 1.526   |
|         |           | 144.24       |     | 1.172E+00           | 6.255E-01 | 1.025E+00      | 1.328E-01 | 1.143   |
|         |           | 154.21       |     | 6.258E-01           | 3.629E-01 | 5.971E-01      | 7.084E-02 | 1.048   |
|         | +         | 269.46       |     | 7.231E-01           | 2.627E-01 | 3.104E-01      | 2.979E-02 | 2.330   |
|         |           | 323.87       | *   | -1.667E-01          | 6.522E-01 | 9.285E-01      | 1.593E-01 | -0.179  |
|         | +         | 338.28       |     | 1.127E+01           | 2.037E+00 | 2.188E+00      | 2.522E-01 | 5.153   |
| AC-227  |           | 79.69        |     | -5.011E-01          | 8.920E-01 | 1.264E+00      | 2.125E-01 | -0.396  |
|         |           | 235.96       |     | 2.996E+00           | 3.966E-01 | 3.929E-01      | 4.466E-02 | 7.625   |
|         |           | 256.23       | *   | 5.702E-02           | 2.212E-01 | 3.732E-01      | 4.772E-02 | 0.153   |
|         | +         | 299.98       |     | 3.417E+00           | 9.223E-01 | 1.456E+00      | 1.874E-01 | 2.347   |
|         |           | 304.50       |     | 7.253E-02           | 1.613E+00 | 2.338E+00      | 3.882E-01 | 0.031   |
|         |           | 334.37       |     | -1.143E+00          | 2.056E+00 | 2.492E+00      | 3.797E-01 | -0.459  |
| TH-227  |           | 79.80        |     | -1.063E+00          | 1.188E+00 | 1.646E+00      | 3.529E-01 | -0.646  |
|         |           | 235.96       |     | 2.996E+00           | 3.831E-01 | 3.929E-01      | 4.258E-02 | 7.625   |
|         |           | 256.23       | *   | 5.702E-02           | 2.212E-01 | 3.732E-01      | 5.323E-02 | 0.153   |
|         | +         | 299.98       |     | 3.417E+00           | 9.223E-01 | 1.456E+00      | 1.874E-01 | 2.347   |
|         |           | 304.50       |     | 7.253E-02           | 1.613E+00 | 2.338E+00      | 3.882E-01 | 0.031   |
|         |           | 334.37       |     | -1.143E+00          | 2.056E+00 | 2.492E+00      | 3.797E-01 | -0.459  |
| PA-231  |           | 283.69       | *   | -1.052E+00          | 1.380E+00 | 2.020E+00      | 3.017E-01 | -0.521  |
|         |           | 301.36       |     | 1.465E+00           | 6.095E-01 | 9.261E-01      | 1.140E-01 | 1.582   |
| TH-231  |           | 81.07        |     | 1.760E-01           | 1.998E-01 | 2.160E-01      | 1.666E-02 | 0.815   |
|         |           | 83.79        |     | 3.670E-01           | 9.439E-02 | 1.420E-01      | 1.089E-02 | 2.583   |
|         |           | 94.87        |     | 8.989E-01           | 3.948E-01 | 5.892E-01      | 5.189E-02 | 1.526   |
|         |           | 144.24       |     | 1.172E+00           | 6.255E-01 | 1.025E+00      | 1.328E-01 | 1.143   |
|         |           | 154.21       |     | 6.258E-01           | 3.629E-01 | 5.971E-01      | 7.084E-02 | 1.048   |
|         | +         | 269.46       |     | 7.231E-01           | 2.627E-01 | 3.104E-01      | 2.979E-02 | 2.330   |
|         |           | 323.87       | *   | -1.667E-01          | 6.522E-01 | 9.285E-01      | 1.593E-01 | -0.179  |
|         | +         | 338.28       |     | 1.127E+01           | 2.037E+00 | 2.188E+00      | 2.522E-01 | 5.153   |
| PA-233  | +         | 300.13       |     | 1.546E+00           | 4.337E-01 | 6.592E-01      | 9.869E-02 | 2.345   |
|         |           | 311.90       | *   | 1.646E-03           | 5.642E-02 | 9.394E-02      | 8.298E-03 | 0.018   |
|         |           | 340.48       |     | 2.985E+00           | 9.705E-01 | 1.121E+00      | 2.667E-01 | 2.662   |
| PA-234  |           | 94.67        |     | 4.770E-01           | 1.544E-01 | 2.220E-01      | 2.777E-02 | 2.149   |
|         |           | 98.44        |     | 1.378E-01           | 1.092E-01 | 1.169E-01      | 6.537E-02 | 1.179   |
|         |           | 111.00       |     | -1.003E-01          | 1.501E-01 | 2.399E-01      | 3.499E-02 | -0.418  |
|         |           | 131.20       |     | 5.907E-02           | 1.069E-01 | 1.539E-01      | 2.067E-02 | 0.384   |
|         |           | 569.50       |     | -1.829E-01          | 2.686E-01 | 4.066E-01      | 2.661E-02 | -0.450  |
|         |           | 733.00       |     | -2.706E-01          | 3.919E-01 | 5.549E-01      | 1.211E-01 | -0.488  |
|         |           | 880.51       |     | -7.418E-02          | 2.575E-01 | 4.191E-01      | 4.149E-02 | -0.177  |
|         |           | 883.24       |     | -6.265E-02          | 2.557E-01 | 4.111E-01      | 2.771E-01 | -0.152  |
|         |           | 926.50       |     | -1.022E-01          | 2.000E-01 | 2.692E-01      | 6.928E-02 | -0.380  |
|         |           | 946.00       | *   | 4.184E-02           | 2.870E-01 | 4.767E-01      | 9.181E-02 | 0.088   |
|         |           | 949.00       |     | 1.335E-02           | 4.285E-01 | 7.074E-01      | 6.800E-02 | 0.019   |
| PA-234M |           | 766.42       |     | 2.036E+01           | 1.688E+01 | 2.091E+01      | 1.059E+01 | 0.974   |



----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| NP-239  |           | 1001.03      | *   | 1.239E+00           | 4.507E+00 | 7.165E+00      | 7.321E-01 | 0.173   |
|         |           | 99.53        |     | 1.838E-01           | 1.675E-01 | 2.102E-01      | 2.029E-02 | 0.874   |
|         | +         | 103.37       |     | 1.318E-01           | 9.574E-02 | 1.325E-01      | 1.375E-02 | 0.994   |
|         | +         | 106.12       |     | 1.112E-01           | 8.082E-02 | 1.147E-01      | 1.251E-02 | 0.969   |
|         |           | 117.23       | *   | 1.282E-01           | 3.312E-01 | 5.435E-01      | 7.147E-02 | 0.236   |
|         |           | 228.18       |     | 4.072E-02           | 1.897E-01 | 3.210E-01      | 3.172E-02 | 0.127   |
| AM-241  | +         | 277.60       |     | 2.831E-01           | 2.429E-01 | 2.719E-01      | 2.531E-02 | 1.041   |
|         |           | 59.54        | *   | 1.155E-01           | 6.254E-02 | 9.385E-02      | 8.397E-03 | 1.231   |
| CM-247  | +         | 278.00       |     | 1.203E+00           | 1.032E+00 | 1.143E+00      | 1.063E-01 | 1.052   |
|         |           | 287.50       |     | 7.238E-01           | 1.185E+00 | 1.839E+00      | 1.678E-01 | 0.394   |
| CF-249  |           | 402.40       | *   | 5.268E-03           | 3.904E-02 | 5.605E-02      | 3.298E-03 | 0.094   |
|         |           | 252.80       |     | 2.975E-01           | 8.150E-01 | 1.380E+00      | 1.333E-01 | 0.216   |
|         |           | 333.37       |     | 2.041E-02           | 2.731E-01 | 2.650E-01      | 2.118E-02 | 0.077   |
| CF-251  |           | 388.16       | *   | 1.293E-02           | 3.779E-02 | 6.301E-02      | 3.763E-03 | 0.205   |
|         |           | 177.52       | *   | -3.270E-02          | 1.145E-01 | 1.824E-01      | 1.817E-02 | -0.179  |
|         |           | 227.38       |     | 1.928E-01           | 3.105E-01 | 5.297E-01      | 5.238E-02 | 0.364   |
|         |           | 285.41       |     | 4.971E-01           | 1.888E+00 | 3.176E+00      | 2.912E-01 | 0.157   |

# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                    *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964003      *
* Acquisition date   : 10-MAR-2010 23:08:59 Detector SN#      :              *
* Detector ID        : GAM05                      Sensitivity   : 5.000        *
* Geometry           : CAN                      Energy tolerance: 1.500        *
* Elapsed live time  : 0 04:00:00.00           Abundance limit : 75.000        *
* Elapsed real time  : 0 04:00:04.37           Half life ratio : 8.000        *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date        : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID          : G247964003              Analyst initials: MXR1         *
* Batch Number       : 958216                  Sample Quantity : 1.3237E+02 GRAM    *
* Recovery           : 1.00000                 Carrier Weight  : 0.00000        *
*****
*
*                                     QC DATA                                *
*
* Standard Weight    : 0.00000                                                         *
* CALIB. DATE/TIME   : 11-JUN-2009 16:41:00 MS Isotope      :                *
* MSD DPM             : 0.000                      MSD Isotope :                *
* LCS DPM             : 0.000                      LCS Isotope  :                *
* LCSD DPM            : 0.000                      LCSD Isotope :                *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act error | MDA<br>(pCi/GRAM ) |           |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.551E+01               | 2.604E+00 | 5.053E-01          | 0.000E+00 |
| CD-109  | 5.880E+00               | 8.725E-01 | 8.670E-01          | 0.000E+00 |
| SN-126  | 5.710E-01               | 8.473E-02 | 8.408E-02          | 0.000E+00 |
| EU-155  | 1.397E-01               | 9.951E-02 | 1.403E-01          | 0.000E+00 |
| TL-208  | 8.469E-01               | 9.436E-02 | 5.433E-02          | 0.000E+00 |
| PB-210  | 2.050E+00               | 6.944E-01 | 7.398E-01          | 0.000E+00 |
| BI-211  | 6.257E+00               | 6.466E-01 | 3.055E-01          | 0.000E+00 |
| BI-212  | 2.633E+00               | 8.472E-01 | 7.219E-01          | 0.000E+00 |
| PB-212  | 2.574E+00               | 2.913E-01 | 8.327E-02          | 0.000E+00 |
| BI-214  | 2.047E+00               | 2.334E-01 | 1.051E-01          | 0.000E+00 |
| PB-214  | 2.271E+00               | 2.648E-01 | 1.049E-01          | 0.000E+00 |
| RA-224  | 7.224E+00               | 1.274E+00 | 8.924E-01          | 0.000E+00 |
| RA-226  | 2.047E+00               | 2.334E-01 | 1.051E-01          | 0.000E+00 |
| AC-228  | 2.705E+00               | 4.404E-01 | 2.168E-01          | 0.000E+00 |
| RA-228  | 2.705E+00               | 4.404E-01 | 2.168E-01          | 0.000E+00 |
| TH-228  | 2.574E+00               | 2.913E-01 | 8.327E-02          | 0.000E+00 |
| TH-229  | -1.274E-01              | 4.750E-01 | 7.989E-01          | 0.000E+00 |
| TH-232  | 2.705E+00               | 4.404E-01 | 2.168E-01          | 0.000E+00 |
| TH-234  | 1.608E+00               | 8.507E-01 | 9.900E-01          | 0.000E+00 |
| U-235   | 2.654E-01               | 1.856E-01 | 3.177E-01          | 0.000E+00 |
| NP-237  | 1.704E+00               | 4.318E-01 | 2.502E-01          | 0.000E+00 |
| U-238   | 1.608E+00               | 8.507E-01 | 9.900E-01          | 0.000E+00 |
| ANH-511 | 2.409E-01               | 6.653E-02 | 4.066E-02          | 0.000E+00 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | -4.677E-02                          | 3.358E-01                | 5.304E-01          | 0.000E+00 NOT IDENT. |
| NA-22   | -1.394E-02                          | 4.283E-02                | 6.957E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 9.537E+07                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| SC-46   | -9.391E-03                          | 3.571E-02                | 5.996E-02          | 0.000E+00 FAIL ABUN  |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| V-48    | -5.395E-02 | 7.751E-02 | 1.255E-01 | 0.000E+00 | NOT IDENT. |
| CR-51   | 8.242E-02  | 3.598E-01 | 6.317E-01 | 0.000E+00 | NOT IDENT. |
| MN-54   | -9.066E-03 | 3.612E-02 | 6.113E-02 | 0.000E+00 | NOT IDENT. |
| CO-56   | 1.439E-02  | 3.551E-02 | 6.205E-02 | 0.000E+00 | FAIL ABUN  |
| CO-57   | -4.605E-03 | 2.300E-02 | 3.664E-02 | 0.000E+00 | NOT IDENT. |
| CO-58   | -6.115E-02 | 3.678E-02 | 5.678E-02 | 0.000E+00 | NOT IDENT. |
| FE-59   | -8.819E-02 | 9.711E-02 | 1.543E-01 | 0.000E+00 | NOT IDENT. |
| CO-60   | 2.136E-02  | 3.523E-02 | 6.083E-02 | 0.000E+00 | NOT IDENT. |
| ZN-65   | 4.040E-02  | 1.008E-01 | 1.492E-01 | 0.000E+00 | NOT IDENT. |
| SE-75   | 2.324E-02  | 4.356E-02 | 6.817E-02 | 0.000E+00 | NOT IDENT. |
| SR-85   | 0.000E+00  | 3.917E-02 | 6.384E-02 | 0.000E+00 | NOT IDENT. |
| Y-88    | 1.612E-02  | 2.916E-02 | 5.208E-02 | 0.000E+00 | NOT IDENT. |
| Y-91    | 2.755E+00  | 2.213E+01 | 3.711E+01 | 0.000E+00 | NOT IDENT. |
| NB-94   | 3.534E-02  | 3.221E-02 | 5.816E-02 | 0.000E+00 | NOT IDENT. |
| NB-95   | 0.000E+00  | 5.089E-02 | 8.230E-02 | 0.000E+00 | NOT IDENT. |
| NB-95M  | 0.000E+00  | 2.352E-01 | 3.034E-01 | 0.000E+00 | NOT IDENT. |
| ZR-95   | 1.976E-03  | 7.279E-02 | 1.257E-01 | 0.000E+00 | NOT IDENT. |
| MO-99   | 7.223E-01  | 3.460E+01 | 5.984E+01 | 0.000E+00 | NOT IDENT. |
| TC-99M  | 0.000E+00  | 6.503E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | 5.718E-03  | 3.900E-02 | 6.657E-02 | 0.000E+00 | NOT IDENT. |
| RH-106  | 2.754E-01  | 2.994E-01 | 5.191E-01 | 0.000E+00 | NOT IDENT. |
| RU-106  | 2.754E-01  | 2.981E-01 | 5.191E-01 | 0.000E+00 | NOT IDENT. |
| AG-108M | -1.814E-02 | 2.638E-02 | 4.388E-02 | 0.000E+00 | NOT IDENT. |
| AG-110M | 1.442E-02  | 3.293E-02 | 5.597E-02 | 0.000E+00 | NOT IDENT. |
| SN-113  | -2.340E-03 | 4.093E-02 | 7.037E-02 | 0.000E+00 | NOT IDENT. |
| CD-115  | 0.000E+00  | 4.100E+01 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| SN-117M | -4.773E-02 | 6.146E-02 | 1.029E-01 | 0.000E+00 | NOT IDENT. |
| TE-123M | -1.513E-02 | 2.608E-02 | 4.393E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | 7.904E-03  | 6.371E-02 | 1.089E-01 | 0.000E+00 | NOT IDENT. |
| SB-125  | -6.007E-02 | 8.200E-02 | 1.363E-01 | 0.000E+00 | FAIL ABUN  |
| TE-125M | 4.932E-01  | 9.327E+00 | 1.388E+01 | 0.000E+00 | NOT IDENT. |
| I-126   | 2.085E-01  | 2.618E-01 | 4.515E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | 5.310E-02  | 1.992E-01 | 3.024E-01 | 0.000E+00 | NOT IDENT. |
| SB-127  | 1.348E+00  | 2.563E+00 | 4.549E+00 | 0.000E+00 | NOT IDENT. |
| I-131   | 7.861E-02  | 1.494E-01 | 2.630E-01 | 0.000E+00 | NOT IDENT. |
| TE-132  | 3.557E-01  | 1.625E+00 | 2.899E+00 | 0.000E+00 | NOT IDENT. |
| BA-133  | 2.081E-02  | 4.054E-02 | 6.239E-02 | 0.000E+00 | FAIL ABUN  |
| I-133   | 0.000E+00  | 1.894E+05 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | 0.000E+00  | 6.718E-02 | 8.857E-02 | 0.000E+00 | FAIL ABUN  |
| CS-135  | 0.000E+00  | 1.661E-01 | 2.683E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 3.983E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | 6.608E-03  | 1.293E-01 | 2.183E-01 | 0.000E+00 | NOT IDENT. |
| BA-137M | -1.310E-02 | 3.432E-02 | 5.600E-02 | 0.000E+00 | NOT IDENT. |
| CS-137  | -1.384E-02 | 3.625E-02 | 5.916E-02 | 0.000E+00 | NOT IDENT. |
| CE-139  | 1.655E-03  | 2.722E-02 | 4.657E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | 1.124E-01  | 3.112E-01 | 5.301E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | 1.410E-01  | 9.807E-02 | 1.697E-01 | 0.000E+00 | FAIL ABUN  |
| CE-141  | 4.342E-02  | 6.177E-02 | 1.075E-01 | 0.000E+00 | NOT IDENT. |
| CE-143  | 0.000E+00  | 3.823E+03 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CE-144  | -9.243E-02 | 2.014E-01 | 2.984E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | 4.303E-03  | 3.205E-02 | 5.592E-02 | 0.000E+00 | NOT IDENT. |
| PR-144  | 3.251E-01  | 2.404E+00 | 4.195E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | 4.142E-02  | 4.036E-02 | 6.559E-02 | 0.000E+00 | NOT IDENT. |
| ND-147  | -5.729E-01 | 6.926E-01 | 1.119E+00 | 0.000E+00 | FAIL ABUN  |
| PM-149  | 0.000E+00  | 3.083E+02 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| EU-152  | -8.527E-02 | 1.535E-01 | 1.466E-01 | 0.000E+00 | FAIL ABUN  |
| GD-153  | 1.075E-01  | 7.108E-02 | 1.129E-01 | 0.000E+00 | NOT IDENT. |
| EU-154  | -3.940E-02 | 1.211E-01 | 1.967E-01 | 0.000E+00 | NOT IDENT. |
| TB-160  | -2.088E-03 | 1.305E-01 | 2.224E-01 | 0.000E+00 | FAIL ABUN  |
| HO-166M | -5.737E-04 | 5.620E-02 | 9.731E-02 | 0.000E+00 | FAIL ABUN  |
| TA-182  | -4.238E-03 | 2.102E-01 | 3.494E-01 | 0.000E+00 | NOT IDENT. |
| IR-192  | -1.305E-02 | 3.127E-02 | 5.380E-02 | 0.000E+00 | FAIL ABUN  |
| HG-203  | 4.645E-02  | 3.946E-02 | 6.284E-02 | 0.000E+00 | NOT IDENT. |
| BI-207  | -4.629E-03 | 5.028E-02 | 8.414E-02 | 0.000E+00 | FAIL ABUN  |
| PB-211  | 2.930E-01  | 7.520E-01 | 1.123E+00 | 0.000E+00 | NOT IDENT. |
| RN-219  | 1.322E-01  | 4.099E-01 | 6.205E-01 | 0.000E+00 | FAIL ABUN  |
| RA-223  | -1.667E-01 | 6.391E-01 | 9.544E-01 | 0.000E+00 | FAIL ABUN  |
| AC-227  | 5.702E-02  | 2.168E-01 | 3.852E-01 | 0.000E+00 | FAIL ABUN  |
| TH-227  | 5.702E-02  | 2.168E-01 | 3.852E-01 | 0.000E+00 | FAIL ABUN  |
| PA-231  | -1.052E+00 | 1.352E+00 | 2.081E+00 | 0.000E+00 | NOT IDENT. |
| TH-231  | -1.667E-01 | 6.391E-01 | 9.544E-01 | 0.000E+00 | FAIL ABUN  |
| PA-233  | 1.646E-03  | 5.529E-02 | 9.663E-02 | 0.000E+00 | FAIL ABUN  |
| PA-234  | 4.184E-02  | 2.813E-01 | 4.811E-01 | 0.000E+00 | NOT IDENT. |
| PA-234M | 1.239E+00  | 4.417E+00 | 7.223E+00 | 0.000E+00 | NOT IDENT. |
| NP-239  | 1.282E-01  | 3.246E-01 | 5.682E-01 | 0.000E+00 | FAIL ABUN  |
| AM-241  | 0.000E+00  | 6.129E-02 | 9.920E-02 | 0.000E+00 | NOT IDENT. |
| CM-247  | 5.268E-03  | 3.826E-02 | 5.740E-02 | 0.000E+00 | FAIL ABUN  |
| CF-249  | 1.293E-02  | 3.703E-02 | 6.457E-02 | 0.000E+00 | NOT IDENT. |

|        |            |           |           |                      |
|--------|------------|-----------|-----------|----------------------|
| CF-251 | -3.270E-02 | 1.122E-01 | 1.894E-01 | 0.000E+00 NOT IDENT. |
|--------|------------|-----------|-----------|----------------------|

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964003.CNF;1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:08:59
Sample ID        : G247964003 Sample quantity : 1.32370E+02 GRAM
Detector name    : GAM05 Detector geometry: CAN
Elapsed live time: 0 04:00:00.00 Elapsed real time: 0 04:00:04.37 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 5.00000
Batch ID        : 958216 Detector SN# :
Matrix Spike ID  : LCS ID : 1032-A
*****

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## Nuclide Line Activity Report

## Nuclide Type:

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|-------------------------|------------------------|-------------------|
| K-40    | 1460.82 | 2679  | 10.66* | 1.004E+00 | 3.551E+01               | 3.551E+01              | 7.48              |
| CD-109  | 88.03   | 1172  | 3.70*  | 7.867E+00 | 5.710E+00               | 5.880E+00              | 15.14             |
| SN-126  | 64.28   | ----- | 9.60   | 8.070E+00 | -----                   | Line Not Found         | -----             |
|         | 86.94   | 1172  | 8.90   | 7.867E+00 | 2.374E+00               | 2.374E+00              | 43.19             |
|         | 87.57   | 1172  | 37.00* | 7.867E+00 | 5.710E-01               | 5.710E-01              | 15.14             |
| EU-155  | 86.55   | 1172  | 30.70  | 7.867E+00 | 6.882E-01               | 6.936E-01              | 15.19             |
|         | 105.31  | 155   | 21.10* | 7.489E+00 | 1.386E-01               | 1.397E-01              | 72.67             |
| TL-208  | 277.37  | 123   | 6.60   | 4.261E+00 | 6.195E-01               | 6.195E-01              | 86.28             |
|         | 583.19  | 1148  | 85.00* | 2.261E+00 | 8.469E-01               | 8.469E-01              | 11.37             |
|         | 860.56  | 155   | 12.50  | 1.589E+00 | 1.103E+00               | 1.103E+00              | 57.64             |
| PB-210  | 46.54   | 466   | 4.25*  | 7.603E+00 | 2.046E+00               | 2.050E+00              | 34.57             |
| BI-211  | 72.87   | ----- | 1.23   | 8.052E+00 | -----                   | Line Not Found         | -----             |
|         | 351.06  | 2006  | 12.92* | 3.519E+00 | 6.257E+00               | 6.257E+00              | 10.54             |
| BI-212  | 727.33  | 229   | 6.67*  | 1.852E+00 | 2.633E+00               | 2.633E+00              | 32.83             |
|         | 785.37  | ----- | 1.10   | 1.726E+00 | -----                   | Line Not Found         | -----             |
|         | 1620.50 | 29    | 1.47   | 9.220E-01 | 2.989E+00               | 2.989E+00              | 78.15             |
| PB-212  | 74.82   | 2299  | 10.28  | 8.040E+00 | 3.943E+00               | 3.943E+00              | 14.99             |
|         | 77.11   | 3425  | 17.10  | 8.017E+00 | 3.543E+00               | 3.543E+00              | 9.40              |
|         | 238.63  | 3782  | 43.60* | 4.778E+00 | 2.574E+00               | 2.574E+00              | 11.55             |
|         | 300.09  | 290   | 3.30   | 4.010E+00 | 3.106E+00               | 3.106E+00              | 26.04             |
| BI-214  | 609.32  | 1427  | 45.49* | 2.173E+00 | 2.047E+00               | 2.047E+00              | 11.64             |
|         | 1120.29 | 273   | 14.92  | 1.259E+00 | 2.061E+00               | 2.061E+00              | 24.36             |
|         | 1764.49 | 269   | 15.30  | 8.614E-01 | 2.892E+00               | 2.892E+00              | 15.21             |
| PB-214  | 74.82   | 2299  | 5.80   | 8.040E+00 | 6.990E+00               | 6.990E+00              | 13.89             |
|         | 77.11   | 3425  | 9.70   | 8.017E+00 | 6.246E+00               | 6.246E+00              | 12.50             |
|         | 242.00  | 989   | 7.25   | 4.735E+00 | 4.085E+00               | 4.085E+00              | 18.91             |
|         | 295.22  | 1113  | 18.42  | 4.062E+00 | 2.110E+00               | 2.110E+00              | 14.21             |
|         | 351.93  | 2006  | 35.60* | 3.519E+00 | 2.271E+00               | 2.271E+00              | 11.90             |
| RA-224  | 240.99  | 989   | 4.10*  | 4.735E+00 | 7.224E+00               | 7.224E+00              | 18.00             |
| RA-226  | 609.32  | 1427  | 45.49* | 2.173E+00 | 2.047E+00               | 2.047E+00              | 11.64             |
|         | 1120.29 | 273   | 14.92  | 1.259E+00 | 2.061E+00               | 2.061E+00              | 24.36             |
|         | 1764.49 | 269   | 15.30  | 8.614E-01 | 2.892E+00               | 2.892E+00              | 15.21             |

Nuclide Type:

| Nuclide | Energy | Area  | %Abn    | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|--------|-------|---------|-----------|-------------------------|------------------------|-------------------|
| AC-228  | 338.32 | 821   | 11.27   | 3.635E+00 | 2.841E+00               | 2.841E+00              | 43.83             |
|         | 911.20 | 744   | 25.80*  | 1.511E+00 | 2.705E+00               | 2.705E+00              | 16.61             |
|         | 968.97 | 420   | 15.80   | 1.430E+00 | 2.637E+00               | 2.637E+00              | 28.61             |
| RA-228  | 338.32 | 821   | 11.27   | 3.635E+00 | 2.841E+00               | 2.841E+00              | 43.83             |
|         | 911.20 | 744   | 25.80*  | 1.511E+00 | 2.705E+00               | 2.705E+00              | 16.61             |
|         | 968.97 | 420   | 15.80   | 1.430E+00 | 2.637E+00               | 2.637E+00              | 28.61             |
| TH-228  | 74.82  | 2299  | 10.28   | 8.040E+00 | 3.943E+00               | 3.943E+00              | 11.46             |
|         | 77.11  | 3425  | 17.10   | 8.017E+00 | 3.543E+00               | 3.543E+00              | 9.40              |
|         | 238.63 | 3782  | 43.60*  | 4.778E+00 | 2.574E+00               | 2.574E+00              | 11.55             |
| TH-229  | 300.09 | 290   | 3.30    | 4.010E+00 | 3.106E+00               | 3.106E+00              | 65.69             |
|         | 85.43  | 1172  | 14.70   | 7.867E+00 | 1.437E+00               | 1.437E+00              | 15.14             |
|         | 88.47  | 668   | 24.00   | 7.818E+00 | 5.047E-01               | 5.048E-01              | 20.27             |
|         | 193.51 | ----- | 4.41*   | 5.516E+00 | -----                   | Line Not Found         | -----             |
|         | 210.85 | ----- | 2.80    | 5.209E+00 | -----                   | Line Not Found         | -----             |
| TH-232  | 338.32 | 821   | 11.27   | 3.635E+00 | 2.841E+00               | 2.841E+00              | 15.98             |
|         | 911.20 | 744   | 25.80*  | 1.511E+00 | 2.705E+00               | 2.705E+00              | 16.61             |
|         | 968.97 | 420   | 15.80   | 1.430E+00 | 2.637E+00               | 2.637E+00              | 28.61             |
| TH-234  | 63.29  | 338   | 3.70*   | 8.062E+00 | 1.608E+00               | 1.608E+00              | 53.99             |
|         | 92.59  | 1037  | 4.23    | 7.757E+00 | 4.480E+00               | 4.480E+00              | 27.24             |
| U-235   | 89.96  | 668   | 3.47    | 7.818E+00 | 3.491E+00               | 3.491E+00              | 30.70             |
|         | 93.35  | 1037  | 5.60    | 7.757E+00 | 3.384E+00               | 3.384E+00              | 28.07             |
|         | 143.76 | ----- | 10.96*  | 6.557E+00 | -----                   | Line Not Found         | -----             |
|         | 163.33 | ----- | 5.08    | 6.119E+00 | -----                   | Line Not Found         | -----             |
|         | 185.72 | 696   | 57.20   | 5.666E+00 | 3.043E-01               | 3.043E-01              | 25.33             |
| NP-237  | 205.31 | ----- | 5.01    | 5.304E+00 | -----                   | Line Not Found         | -----             |
|         | 86.48  | 1172  | 12.40*  | 7.867E+00 | 1.704E+00               | 1.704E+00              | 25.86             |
|         | 95.86  | ----- | 2.68    | 7.688E+00 | -----                   | Line Not Found         | -----             |
| U-238   | 63.29  | 338   | 3.70*   | 8.062E+00 | 1.608E+00               | 1.608E+00              | 53.99             |
|         | 92.59  | 1037  | 4.23    | 7.757E+00 | 4.480E+00               | 4.480E+00              | 18.13             |
| ANH-511 | 511.00 | 433   | 100.00* | 2.547E+00 | 2.409E-01               | 2.409E-01              | 28.19             |

Flag: "\*" = Keyline

Total number of lines in spectrum 41  
Number of unidentified lines 8  
Number of lines tentatively identified by NID 33 80.49%

Nuclide Type :

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|-------------------------|------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.25E+09Y | 1.00  | 3.551E+01               | 3.551E+01              | 0.266E+01                   | 7.48              |       |
| CD-109           | 461.40D   | 1.03  | 5.710E+00               | 5.880E+00              | 0.890E+00                   | 15.14             |       |
| SN-126           | 2.30E+05Y | 1.00  | 5.710E-01               | 5.710E-01              | 0.865E-01                   | 15.14             |       |
| EU-155           | 4.75Y     | 1.01  | 1.386E-01               | 1.397E-01              | 1.015E-01                   | 72.67             |       |
| TL-208           | 1.41E+10Y | 1.00  | 8.469E-01               | 8.469E-01              | 0.963E-01                   | 11.37             |       |
| PB-210           | 22.20Y    | 1.00  | 2.046E+00               | 2.050E+00              | 0.709E+00                   | 34.57             |       |
| BI-211           | 7.04E+08Y | 1.00  | 6.257E+00               | 6.257E+00              | 0.660E+00                   | 10.54             |       |
| BI-212           | 1.41E+10Y | 1.00  | 2.633E+00               | 2.633E+00              | 0.865E+00                   | 32.83             |       |
| PB-212           | 1.41E+10Y | 1.00  | 2.574E+00               | 2.574E+00              | 0.297E+00                   | 11.55             |       |
| BI-214           | 1600.00Y  | 1.00  | 2.047E+00               | 2.047E+00              | 0.238E+00                   | 11.64             |       |
| PB-214           | 1600.00Y  | 1.00  | 2.271E+00               | 2.271E+00              | 0.270E+00                   | 11.90             |       |
| RA-224           | 1.41E+10Y | 1.00  | 7.224E+00               | 7.224E+00              | 1.300E+00                   | 18.00             |       |
| RA-226           | 1600.00Y  | 1.00  | 2.047E+00               | 2.047E+00              | 0.238E+00                   | 11.64             |       |
| AC-228           | 1.41E+10Y | 1.00  | 2.705E+00               | 2.705E+00              | 0.449E+00                   | 16.61             |       |
| RA-228           | 1.41E+10Y | 1.00  | 2.705E+00               | 2.705E+00              | 0.449E+00                   | 16.61             |       |
| TH-228           | 1.41E+10Y | 1.00  | 2.574E+00               | 2.574E+00              | 0.297E+00                   | 11.55             |       |
| TH-229           | 7340.00Y  | 1.00  | 5.047E-01               | 5.048E-01              | 1.023E-01                   | 20.27             | K     |
| TH-232           | 1.41E+10Y | 1.00  | 2.705E+00               | 2.705E+00              | 0.449E+00                   | 16.61             |       |
| TH-234           | 4.47E+09Y | 1.00  | 1.608E+00               | 1.608E+00              | 0.868E+00                   | 53.99             |       |
| U-235            | 7.04E+08Y | 1.00  | 3.043E-01               | 3.043E-01              | 0.771E-01                   | 25.33             | K     |
| NP-237           | 2.14E+06Y | 1.00  | 1.704E+00               | 1.704E+00              | 0.441E+00                   | 25.86             |       |
| U-238            | 4.47E+09Y | 1.00  | 1.608E+00               | 1.608E+00              | 0.868E+00                   | 53.99             |       |
| ANH-511          | 1.00E+09Y | 1.00  | 2.409E-01               | 2.409E-01              | 0.679E-01                   | 28.19             |       |
| Total Activity : |           |       | 8.653E+01               | 8.671E+01              |                             |                   |       |

Grand Total Activity : 8.653E+01 8.671E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : G247964003

Page : 4  
Acquisition date : 10-MAR-2010 23:08:59

| It | Energy  | Area | Bkgnd | FWHM  | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|-------|---------|------|----|----------|------|----------|-------|
| 0  | 128.28  | 328  | 1426  | 0.91  | 257.53  | 252  | 12 | 2.28E-02 | 47.3 | 6.92E+00 |       |
| 0  | 209.07  | 359  | 844   | 1.00  | 419.08  | 413  | 10 | 2.50E-02 | 32.1 | 5.24E+00 |       |
| 0  | 269.81  | 309  | 652   | 1.65  | 540.53  | 535  | 12 | 2.14E-02 | 35.0 | 4.35E+00 | T     |
| 0  | 327.75  | 200  | 480   | 1.07  | 656.39  | 652  | 10 | 1.39E-02 | 43.3 | 3.73E+00 | T     |
| 0  | 407.73  | 174  | 504   | 1.43  | 816.29  | 809  | 15 | 1.21E-02 | 58.2 | 3.10E+00 |       |
| 0  | 462.10  | 268  | 356   | 1.60  | 924.99  | 917  | 16 | 1.86E-02 | 33.8 | 2.78E+00 | T     |
| 0  | 767.98  | 140  | 194   | 1.65  | 1536.41 | 1531 | 12 | 9.70E-03 | 43.6 | 1.76E+00 |       |
| 0  | 794.55  | 119  | 194   | 1.60  | 1589.52 | 1583 | 13 | 8.25E-03 | 51.8 | 1.71E+00 | T     |
| 0  | 933.58  | 69   | 152   | 1.76  | 1867.37 | 1860 | 13 | 4.76E-03 | 78.2 | 1.48E+00 |       |
| 1  | 963.86  | 151  | 135   | 2.19  | 1927.89 | 1920 | 28 | 1.05E-02 | 35.6 | 1.44E+00 | T     |
| 0  | 1238.02 | 82   | 169   | 2.27  | 2475.70 | 2469 | 12 | 5.71E-03 | 67.3 | 1.15E+00 | T     |
| 0  | 1377.87 | 83   | 94    | 1.92  | 2755.09 | 2747 | 16 | 5.77E-03 | 57.8 | 1.05E+00 |       |
| 0  | 1592.08 | 112  | 94    | 10.67 | 3182.98 | 3164 | 33 | 7.80E-03 | 56.9 | 9.35E-01 |       |
| 0  | 1728.91 | 70   | 17    | 1.76  | 3456.26 | 3448 | 14 | 4.85E-03 | 34.8 | 8.75E-01 |       |

Flags: "T" = Tentatively associated



```

*****
*                                     GEL Laboratories LLC
*                                     2040 Savage Road
*                                     Charleston, SC 29414
*****
*
*                               DETECTOR DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964003.CNF;1
* Acquisition date   : 10-MAR-2010 23:08:59   Detector SN#      :
* Detector ID        : GAM05                  Sensitivity         : 5.00000
* Geometry           : CAN                    Energy tolerance    : 1.50000
* Elapsed live time  : 0 04:00:00.00          Abundance limit     : 75.00000
* Elapsed real time  : 0 04:00:04.37          Half life ratio     : 8.00000
*****
*
*                               SAMPLE DATA
*
* Sample date        : 19-FEB-2010 12:00:00   Nuclide Library : SOLID
* Sample ID          : G247964003             Analyst initials: MXR1
* Batch Number       : 958216                 Sample Quantity  : 1.32370E+02 GRAM
*****
*
*                               QC DATA
*
* CALIB. DATE/TIME   : 11-JUN-2009 16:41:00.5MS Isotope      :
* MSD ID             :                          MSD Isotope   :
* LCS ID             : 1032-A                  LCS Isotope        :
*****

```

## Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| K-40    | 3.551E+01              | 2.658E+00 | 5.046E-01         | 3.138E-02 | 70.375  |
| CD-109  | 5.880E+00              | 8.903E-01 | 8.254E-01         | 6.286E-02 | 7.124   |
| SN-126  | 5.710E-01              | 8.646E-02 | 8.005E-02         | 6.096E-03 | 7.133   |
| EU-155  | 1.397E-01              | 1.015E-01 | 1.340E-01         | 1.451E-02 | 1.043   |
| TL-208  | 8.469E-01              | 9.629E-02 | 5.338E-02         | 3.921E-03 | 15.865  |
| PB-210  | 2.050E+00              | 7.086E-01 | 6.972E-01         | 5.377E-02 | 2.940   |
| BI-211  | 6.257E+00              | 6.598E-01 | 2.976E-01         | 2.359E-02 | 21.023  |
| BI-212  | 2.633E+00              | 8.645E-01 | 7.120E-01         | 8.346E-02 | 3.698   |
| PB-212  | 2.574E+00              | 2.972E-01 | 8.059E-02         | 8.724E-03 | 31.941  |
| BI-214  | 2.047E+00              | 2.382E-01 | 1.033E-01         | 8.719E-03 | 19.811  |
| PB-214  | 2.271E+00              | 2.702E-01 | 1.022E-01         | 9.844E-03 | 22.222  |
| RA-224  | 7.224E+00              | 1.300E+00 | 8.639E-01         | 8.452E-02 | 8.362   |
| RA-226  | 2.047E+00              | 2.382E-01 | 1.033E-01         | 8.719E-03 | 19.811  |
| AC-228  | 2.705E+00              | 4.494E-01 | 2.147E-01         | 2.725E-02 | 12.600  |
| RA-228  | 2.705E+00              | 4.494E-01 | 2.147E-01         | 2.725E-02 | 12.600  |
| TH-228  | 2.574E+00              | 2.972E-01 | 8.059E-02         | 8.724E-03 | 31.941  |
| TH-229  | 5.048E-01              | 1.023E-01 | 7.705E-01         | 7.695E-02 | 0.655   |
| TH-232  | 2.705E+00              | 4.494E-01 | 2.147E-01         | 2.725E-02 | 12.600  |

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| TH-234  | 1.608E+00              | 8.681E-01 | 9.375E-01         | 1.701E-01 | 1.715   |
| U-235   | 3.043E-01              | 7.710E-02 | 3.049E-01         | 5.817E-02 | 0.998   |
| NP-237  | 1.704E+00              | 4.407E-01 | 2.381E-01         | 5.313E-02 | 7.156   |
| U-238   | 1.608E+00              | 8.681E-01 | 9.375E-01         | 1.701E-01 | 1.715   |
| ANH-511 | 2.409E-01              | 6.789E-02 | 3.987E-02         | 2.552E-03 | 6.042   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| BE-7    | -4.677E-02                         |              | 3.427E-01 | 5.194E-01         | 3.720E-02 | -0.090  |
| NA-22   | -1.394E-02                         |              | 4.370E-02 | 6.931E-02         | 4.037E-03 | -0.201  |
| NA-24   | -3.145E+01                         |              | 4.866E+01 | Half-Life         | too short |         |
| SC-46   | -9.391E-03                         |              | 3.644E-02 | 5.935E-02         | 5.961E-03 | -0.158  |
| V-48    | -5.395E-02                         |              | 7.909E-02 | 1.244E-01         | 1.140E-02 | -0.434  |
| CR-51   | 8.242E-02                          |              | 3.672E-01 | 6.144E-01         | 5.429E-02 | 0.134   |
| MN-54   | -9.066E-03                         |              | 3.685E-02 | 6.044E-02         | 5.537E-03 | -0.150  |
| CO-56   | 1.439E-02                          |              | 3.623E-02 | 6.137E-02         | 5.740E-03 | 0.234   |
| CO-57   | -4.605E-03                         |              | 2.347E-02 | 3.507E-02         | 4.975E-03 | -0.131  |
| CO-58   | -6.115E-02                         |              | 3.753E-02 | 5.612E-02         | 4.939E-03 | -1.090  |
| FE-59   | -8.819E-02                         |              | 9.909E-02 | 1.533E-01         | 1.241E-02 | -0.575  |
| CO-60   | 2.136E-02                          |              | 3.595E-02 | 6.065E-02         | 3.510E-03 | 0.352   |
| ZN-65   | 4.040E-02                          |              | 1.029E-01 | 1.483E-01         | 1.036E-02 | 0.272   |
| SE-75   | 2.324E-02                          |              | 4.445E-02 | 6.609E-02         | 6.310E-03 | 0.352   |
| SR-85   | 8.304E-02                          |              | 3.997E-02 | 6.260E-02         | 4.012E-03 | 1.327   |
| Y-88    | 1.612E-02                          |              | 2.975E-02 | 5.222E-02         | 2.988E-03 | 0.309   |
| Y-91    | 2.755E+00                          |              | 2.259E+01 | 3.693E+01         | 2.146E+00 | 0.075   |
| NB-94   | 3.534E-02                          |              | 3.287E-02 | 5.733E-02         | 4.102E-03 | 0.616   |
| NB-95   | 8.517E-02                          |              | 5.193E-02 | 8.126E-02         | 6.572E-03 | 1.048   |
| NB-95M  | 1.633E+00                          |              | 2.400E-01 | 2.936E-01         | 3.216E-02 | 5.562   |
| ZR-95   | 1.976E-03                          |              | 7.427E-02 | 1.241E-01         | 1.107E-02 | 0.016   |
| MO-99   | 7.223E-01                          |              | 3.531E+01 | 5.905E+01         | 9.017E+00 | 0.012   |
| TC-99M  | -5.339E+15                         |              | 3.318E+15 | Half-Life         | too short |         |
| RU-103  | 5.718E-03                          |              | 3.979E-02 | 6.523E-02         | 8.280E-03 | 0.088   |
| RH-106  | 2.754E-01                          |              | 3.055E-01 | 5.106E-01         | 6.146E-02 | 0.539   |
| RU-106  | 2.754E-01                          |              | 3.042E-01 | 5.106E-01         | 3.366E-02 | 0.539   |
| AG-108M | -1.814E-02                         |              | 2.692E-02 | 4.290E-02         | 2.770E-03 | -0.423  |
| AG-110M | 1.442E-02                          |              | 3.361E-02 | 5.511E-02         | 3.810E-03 | 0.262   |
| SN-113  | -2.340E-03                         |              | 4.177E-02 | 6.867E-02         | 4.260E-03 | -0.034  |
| CD-115  | -4.803E-06                         |              | 2.092E-05 | Half-Life         | too short |         |
| SN-117M | -4.773E-02                         |              | 6.272E-02 | 9.889E-02         | 1.063E-02 | -0.483  |
| TE-123M | -1.513E-02                         |              | 2.661E-02 | 4.223E-02         | 4.537E-03 | -0.358  |
| SB-124  | 7.904E-03                          |              | 6.501E-02 | 1.090E-01         | 6.933E-03 | 0.072   |
| SB-125  | -6.007E-02                         |              | 8.368E-02 | 1.333E-01         | 8.345E-03 | -0.451  |
| TE-125M | 4.932E-01                          |              | 9.517E+00 | 1.326E+01         | 1.722E+00 | 0.037   |
| I-126   | 2.085E-01                          |              | 2.671E-01 | 4.447E-01         | 2.953E-02 | 0.469   |
| SB-126  | 5.310E-02                          |              | 2.033E-01 | 2.983E-01         | 2.212E-02 | 0.178   |
| SB-127  | 1.348E+00                          |              | 2.615E+00 | 4.483E+00         | 5.229E-01 | 0.301   |

----- Non-Identified Nuclides -----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| I-131   | 7.861E-02                          |              | 1.525E-01 | 2.564E-01           | 1.935E-02 | 0.307   |
| TE-132  | 3.557E-01                          |              | 1.658E+00 | 2.804E+00           | 4.894E-01 | 0.127   |
| BA-133  | 2.081E-02                          |              | 4.137E-02 | 6.079E-02           | 7.345E-03 | 0.342   |
| I-133   | -2.059E-01                         |              | 9.666E-02 | Half-Life too short |           |         |
| CS-134  | 1.306E-01                          | +            | 6.856E-02 | 8.750E-02           | 7.535E-03 | 1.492   |
| CS-135  | 4.141E-01                          |              | 1.694E-01 | 2.602E-01           | 2.784E-02 | 1.591   |
| I-135   | -2.414E+13                         |              | 2.032E+14 | Half-Life too short |           |         |
| CS-136  | 6.608E-03                          |              | 1.319E-01 | 2.167E-01           | 1.857E-02 | 0.030   |
| BA-137M | -1.310E-02                         |              | 3.502E-02 | 5.515E-02           | 3.627E-03 | -0.238  |
| CS-137  | -1.384E-02                         |              | 3.699E-02 | 5.826E-02           | 3.844E-03 | -0.238  |
| CE-139  | 1.655E-03                          |              | 2.778E-02 | 4.480E-02           | 4.447E-03 | 0.037   |
| BA-140  | 1.124E-01                          |              | 3.176E-01 | 5.201E-01           | 1.739E-01 | 0.216   |
| LA-140  | 1.410E-01                          |              | 1.001E-01 | 1.698E-01           | 9.977E-03 | 0.831   |
| CE-141  | 4.342E-02                          |              | 6.303E-02 | 1.032E-01           | 1.262E-02 | 0.421   |
| CE-143  | 1.506E-02                          |              | 1.950E-03 | Half-Life too short |           |         |
| CE-144  | -9.243E-02                         |              | 2.055E-01 | 2.861E-01           | 5.230E-02 | -0.323  |
| PM-144  | 4.303E-03                          |              | 3.271E-02 | 5.512E-02           | 3.899E-03 | 0.078   |
| PR-144  | 3.251E-01                          |              | 2.453E+00 | 4.135E+00           | 2.922E-01 | 0.079   |
| PM-146  | 4.142E-02                          |              | 4.118E-02 | 6.418E-02           | 5.592E-03 | 0.645   |
| ND-147  | -5.729E-01                         |              | 7.068E-01 | 1.098E+00           | 1.517E-01 | -0.522  |
| PM-149  | 6.862E-05                          |              | 1.573E-04 | Half-Life too short |           |         |
| EU-152  | -8.527E-02                         |              | 1.567E-01 | 1.427E-01           | 1.173E-02 | -0.597  |
| GD-153  | 1.075E-01                          |              | 7.253E-02 | 1.077E-01           | 9.979E-03 | 0.999   |
| EU-154  | -3.940E-02                         |              | 1.236E-01 | 1.959E-01           | 1.848E-02 | -0.201  |
| TB-160  | -2.088E-03                         |              | 1.331E-01 | 2.202E-01           | 2.175E-02 | -0.009  |
| HO-166M | -5.737E-04                         |              | 5.734E-02 | 9.596E-02           | 6.991E-03 | -0.006  |
| TA-182  | -4.238E-03                         |              | 2.145E-01 | 3.478E-01           | 2.022E-02 | -0.012  |
| IR-192  | -1.305E-02                         |              | 3.191E-02 | 5.231E-02           | 4.440E-03 | -0.249  |
| HG-203  | 4.645E-02                          |              | 4.027E-02 | 6.098E-02           | 5.784E-03 | 0.762   |
| BI-207  | -4.629E-03                         |              | 5.130E-02 | 8.355E-02           | 6.616E-03 | -0.055  |
| PB-211  | 2.930E-01                          |              | 7.673E-01 | 1.097E+00           | 5.263E-01 | 0.267   |
| RN-219  | 1.322E-01                          |              | 4.183E-01 | 6.059E-01           | 8.163E-02 | 0.218   |
| RA-223  | -1.667E-01                         |              | 6.522E-01 | 9.285E-01           | 1.593E-01 | -0.179  |
| AC-227  | 5.702E-02                          |              | 2.212E-01 | 3.732E-01           | 4.772E-02 | 0.153   |
| TH-227  | 5.702E-02                          |              | 2.212E-01 | 3.732E-01           | 5.323E-02 | 0.153   |
| PA-231  | -1.052E+00                         |              | 1.380E+00 | 2.020E+00           | 3.017E-01 | -0.521  |
| TH-231  | -1.667E-01                         |              | 6.522E-01 | 9.285E-01           | 1.593E-01 | -0.179  |
| PA-233  | 1.646E-03                          |              | 5.642E-02 | 9.394E-02           | 8.298E-03 | 0.018   |
| PA-234  | 4.184E-02                          |              | 2.870E-01 | 4.767E-01           | 9.181E-02 | 0.088   |
| PA-234M | 1.239E+00                          |              | 4.507E+00 | 7.165E+00           | 7.321E-01 | 0.173   |
| NP-239  | 1.282E-01                          |              | 3.312E-01 | 5.435E-01           | 7.147E-02 | 0.236   |
| AM-241  | 1.155E-01                          |              | 6.254E-02 | 9.385E-02           | 8.397E-03 | 1.231   |
| CM-247  | 5.268E-03                          |              | 3.904E-02 | 5.605E-02           | 3.298E-03 | 0.094   |
| CF-249  | 1.293E-02                          |              | 3.779E-02 | 6.301E-02           | 3.763E-03 | 0.205   |
| CF-251  | -3.270E-02                         |              | 1.145E-01 | 1.824E-01           | 1.817E-02 | -0.179  |

# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                    *
*****
*                                     DETECTOR DATA                          *
*
* Configuration      : SYS$SYSROOT:[ALPHA.ARCHIVE.GAMMA]G247964003          *
* Acquisition date   : 10-MAR-2010 23:08:59 Detector SN# :                *
* Detector ID        : GAM05 Sensitivity : 5.000                          *
* Geometry           : CAN Energy tolerance: 1.500                        *
* Elapsed live time: 0 04:00:00.00 Abundance limit : 75.000               *
* Elapsed real time: 0 04:00:04.37 Half life ratio : 8.000                *
*****
*                                     SAMPLE DATA                            *
*
* Sample date        : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID          : G247964003 Analyst initials: MXR1                 *
* Batch Number       : 958216 Sample Quantity : 1.3237E+02 GRAM          *
* Recovery           : 1.00000 Carrier Weight : 0.00000                  *
*****
*                                     QC DATA                               *
*
* CALIB. DATE/TIME   : 11-JUN-2009 16:41:00 MS Isotope :                  *
* MSD DPM             : 0.000 MSD Isotope :                               *
* LCS DPM             : 0.000 LCS Isotope :                               *
* LCSD DPM            : 0.000 LCSD Isotope :                              *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act Error | DLC<br>(pCi/GRAM ) | TPU       |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.551E+01               | 2.604E+00 | 2.528E-01          | 1.329E+00 |
| CD-109  | 5.880E+00               | 8.725E-01 | 4.338E-01          | 4.452E-01 |
| SN-126  | 5.710E-01               | 8.473E-02 | 4.207E-02          | 4.323E-02 |
| EU-155  | 1.397E-01               | 9.951E-02 | 7.022E-02          | 5.077E-02 |
| TL-208  | 8.469E-01               | 9.436E-02 | 2.718E-02          | 4.814E-02 |
| PB-210  | 2.050E+00               | 6.944E-01 | 3.701E-01          | 3.543E-01 |
| BI-211  | 6.257E+00               | 6.466E-01 | 1.529E-01          | 3.299E-01 |
| BI-212  | 2.633E+00               | 8.472E-01 | 3.611E-01          | 4.323E-01 |
| PB-212  | 2.574E+00               | 2.913E-01 | 4.166E-02          | 1.486E-01 |
| BI-214  | 2.047E+00               | 2.334E-01 | 5.256E-02          | 1.191E-01 |
| PB-214  | 2.271E+00               | 2.648E-01 | 5.248E-02          | 1.351E-01 |
| RA-224  | 7.224E+00               | 1.274E+00 | 4.465E-01          | 6.501E-01 |
| RA-226  | 2.047E+00               | 2.334E-01 | 5.256E-02          | 1.191E-01 |
| AC-228  | 2.705E+00               | 4.404E-01 | 1.085E-01          | 2.247E-01 |
| RA-228  | 2.705E+00               | 4.404E-01 | 1.085E-01          | 2.247E-01 |
| TH-228  | 2.574E+00               | 2.913E-01 | 4.166E-02          | 1.486E-01 |
| TH-229  | -1.274E-01              | 4.750E-01 | 3.997E-01          | 2.424E-01 |
| TH-232  | 2.705E+00               | 4.404E-01 | 1.085E-01          | 2.247E-01 |
| TH-234  | 1.608E+00               | 8.507E-01 | 4.953E-01          | 4.340E-01 |
| U-235   | 2.654E-01               | 1.856E-01 | 1.590E-01          | 9.468E-02 |
| NP-237  | 1.704E+00               | 4.318E-01 | 1.252E-01          | 2.203E-01 |
| U-238   | 1.608E+00               | 8.507E-01 | 4.953E-01          | 4.340E-01 |
| ANH-511 | 2.409E-01               | 6.653E-02 | 2.034E-02          | 3.394E-02 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act error | DLC<br>(pCi/GRAM ) | TPU                  |
|---------|-------------------------------------|---------------|--------------------|----------------------|
| BE-7    | -4.677E-02                          | 3.358E-01     | 2.654E-01          | 1.713E-01 NOT IDENT. |
| NA-22   | -1.394E-02                          | 4.283E-02     | 3.481E-02          | 2.185E-02 NOT IDENT. |
| NA-24   | -3.145E+07                          | 9.537E+07     | 0.000E+00          | 4.866E+07 SHORT HLIF |
| SC-46   | -9.391E-03                          | 3.571E-02     | 3.000E-02          | 1.822E-02 FAIL ABUN  |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| V-48    | -5.395E-02 | 7.751E-02 | 6.278E-02 | 3.954E-02 | NOT IDENT. |
| CR-51   | 8.242E-02  | 3.598E-01 | 3.160E-01 | 1.836E-01 | NOT IDENT. |
| MN-54   | -9.066E-03 | 3.612E-02 | 3.058E-02 | 1.843E-02 | NOT IDENT. |
| CO-56   | 1.439E-02  | 3.551E-02 | 3.105E-02 | 1.812E-02 | FAIL ABUN  |
| CO-57   | -4.605E-03 | 2.300E-02 | 1.833E-02 | 1.174E-02 | NOT IDENT. |
| CO-58   | -6.115E-02 | 3.678E-02 | 2.841E-02 | 1.877E-02 | NOT IDENT. |
| FE-59   | -8.819E-02 | 9.711E-02 | 7.719E-02 | 4.955E-02 | NOT IDENT. |
| CO-60   | 2.136E-02  | 3.523E-02 | 3.043E-02 | 1.798E-02 | NOT IDENT. |
| ZN-65   | 4.040E-02  | 1.008E-01 | 7.466E-02 | 5.145E-02 | NOT IDENT. |
| SE-75   | 2.324E-02  | 4.356E-02 | 3.410E-02 | 2.222E-02 | NOT IDENT. |
| SR-85   | 8.304E-02  | 3.917E-02 | 3.194E-02 | 1.999E-02 | NOT IDENT. |
| Y-88    | 1.612E-02  | 2.916E-02 | 2.605E-02 | 1.488E-02 | NOT IDENT. |
| Y-91    | 2.755E+00  | 2.213E+01 | 1.856E+01 | 1.129E+01 | NOT IDENT. |
| NB-94   | 3.534E-02  | 3.221E-02 | 2.910E-02 | 1.643E-02 | NOT IDENT. |
| NB-95   | 8.517E-02  | 5.089E-02 | 4.117E-02 | 2.597E-02 | NOT IDENT. |
| NB-95M  | 1.633E+00  | 2.352E-01 | 1.518E-01 | 1.200E-01 | NOT IDENT. |
| ZR-95   | 1.976E-03  | 7.279E-02 | 6.289E-02 | 3.714E-02 | NOT IDENT. |
| MO-99   | 7.223E-01  | 3.460E+01 | 2.994E+01 | 1.765E+01 | NOT IDENT. |
| TC-99M  | -5.339E+21 | 6.503E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | 5.718E-03  | 3.900E-02 | 3.330E-02 | 1.990E-02 | NOT IDENT. |
| RH-106  | 2.754E-01  | 2.994E-01 | 2.597E-01 | 1.527E-01 | NOT IDENT. |
| RU-106  | 2.754E-01  | 2.981E-01 | 2.597E-01 | 1.521E-01 | NOT IDENT. |
| AG-108M | -1.814E-02 | 2.638E-02 | 2.195E-02 | 1.346E-02 | NOT IDENT. |
| AG-110M | 1.442E-02  | 3.293E-02 | 2.800E-02 | 1.680E-02 | NOT IDENT. |
| SN-113  | -2.340E-03 | 4.093E-02 | 3.520E-02 | 2.088E-02 | NOT IDENT. |
| CD-115  | -4.803E+00 | 4.100E+01 | 0.000E+00 | 2.092E+01 | SHORT HLIF |
| SN-117M | -4.773E-02 | 6.146E-02 | 5.147E-02 | 3.136E-02 | NOT IDENT. |
| TE-123M | -1.513E-02 | 2.608E-02 | 2.198E-02 | 1.331E-02 | NOT IDENT. |
| SB-124  | 7.904E-03  | 6.371E-02 | 5.449E-02 | 3.251E-02 | NOT IDENT. |
| SB-125  | -6.007E-02 | 8.200E-02 | 6.821E-02 | 4.184E-02 | FAIL ABUN  |
| TE-125M | 4.932E-01  | 9.327E+00 | 6.943E+00 | 4.759E+00 | NOT IDENT. |
| I-126   | 2.085E-01  | 2.618E-01 | 2.259E-01 | 1.336E-01 | NOT IDENT. |
| SB-126  | 5.310E-02  | 1.992E-01 | 1.513E-01 | 1.016E-01 | NOT IDENT. |
| SB-127  | 1.348E+00  | 2.563E+00 | 2.276E+00 | 1.307E+00 | NOT IDENT. |
| I-131   | 7.861E-02  | 1.494E-01 | 1.316E-01 | 7.624E-02 | NOT IDENT. |
| TE-132  | 3.557E-01  | 1.625E+00 | 1.450E+00 | 8.290E-01 | NOT IDENT. |
| BA-133  | 2.081E-02  | 4.054E-02 | 3.121E-02 | 2.069E-02 | FAIL ABUN  |
| I-133   | -2.059E+05 | 1.894E+05 | 0.000E+00 | 9.666E+04 | SHORT HLIF |
| CS-134  | 1.306E-01  | 6.718E-02 | 4.431E-02 | 3.428E-02 | FAIL ABUN  |
| CS-135  | 4.141E-01  | 1.661E-01 | 1.343E-01 | 8.472E-02 | NOT IDENT. |
| I-135   | -2.414E+19 | 3.983E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | 6.608E-03  | 1.293E-01 | 1.092E-01 | 6.595E-02 | NOT IDENT. |
| BA-137M | -1.310E-02 | 3.432E-02 | 2.802E-02 | 1.751E-02 | NOT IDENT. |
| CS-137  | -1.384E-02 | 3.625E-02 | 2.960E-02 | 1.850E-02 | NOT IDENT. |
| CE-139  | 1.655E-03  | 2.722E-02 | 2.330E-02 | 1.389E-02 | NOT IDENT. |
| BA-140  | 1.124E-01  | 3.112E-01 | 2.652E-01 | 1.588E-01 | NOT IDENT. |
| LA-140  | 1.410E-01  | 9.807E-02 | 8.492E-02 | 5.003E-02 | FAIL ABUN  |
| CE-141  | 4.342E-02  | 6.177E-02 | 5.378E-02 | 3.151E-02 | NOT IDENT. |
| CE-143  | 1.506E+04  | 3.823E+03 | 0.000E+00 | 1.950E+03 | SHORT HLIF |
| CE-144  | -9.243E-02 | 2.014E-01 | 1.493E-01 | 1.027E-01 | NOT IDENT. |
| PM-144  | 4.303E-03  | 3.205E-02 | 2.798E-02 | 1.635E-02 | NOT IDENT. |
| PR-144  | 3.251E-01  | 2.404E+00 | 2.099E+00 | 1.227E+00 | NOT IDENT. |
| PM-146  | 4.142E-02  | 4.036E-02 | 3.282E-02 | 2.059E-02 | NOT IDENT. |
| ND-147  | -5.729E-01 | 6.926E-01 | 5.598E-01 | 3.534E-01 | FAIL ABUN  |
| PM-149  | 6.862E+01  | 3.083E+02 | 0.000E+00 | 1.573E+02 | SHORT HLIF |
| EU-152  | -8.527E-02 | 1.535E-01 | 7.332E-02 | 7.834E-02 | FAIL ABUN  |
| GD-153  | 1.075E-01  | 7.108E-02 | 5.648E-02 | 3.626E-02 | NOT IDENT. |
| EU-154  | -3.940E-02 | 1.211E-01 | 9.840E-02 | 6.179E-02 | NOT IDENT. |
| TB-160  | -2.088E-03 | 1.305E-01 | 1.113E-01 | 6.656E-02 | FAIL ABUN  |
| HO-166M | -5.737E-04 | 5.620E-02 | 4.869E-02 | 2.867E-02 | FAIL ABUN  |
| TA-182  | -4.238E-03 | 2.102E-01 | 1.748E-01 | 1.072E-01 | NOT IDENT. |
| IR-192  | -1.305E-02 | 3.127E-02 | 2.691E-02 | 1.595E-02 | FAIL ABUN  |
| HG-203  | 4.645E-02  | 3.946E-02 | 3.144E-02 | 2.013E-02 | NOT IDENT. |
| BI-207  | -4.629E-03 | 5.028E-02 | 4.209E-02 | 2.565E-02 | FAIL ABUN  |
| PB-211  | 2.930E-01  | 7.520E-01 | 5.619E-01 | 3.837E-01 | NOT IDENT. |
| RN-219  | 1.322E-01  | 4.099E-01 | 3.105E-01 | 2.091E-01 | FAIL ABUN  |
| RA-223  | -1.667E-01 | 6.391E-01 | 4.775E-01 | 3.261E-01 | FAIL ABUN  |
| AC-227  | 5.702E-02  | 2.168E-01 | 1.927E-01 | 1.106E-01 | FAIL ABUN  |
| TH-227  | 5.702E-02  | 2.168E-01 | 1.927E-01 | 1.106E-01 | FAIL ABUN  |
| PA-231  | -1.052E+00 | 1.352E+00 | 1.041E+00 | 6.900E-01 | NOT IDENT. |
| TH-231  | -1.667E-01 | 6.391E-01 | 4.775E-01 | 3.261E-01 | FAIL ABUN  |
| PA-233  | 1.646E-03  | 5.529E-02 | 4.834E-02 | 2.821E-02 | FAIL ABUN  |
| PA-234  | 4.184E-02  | 2.813E-01 | 2.407E-01 | 1.435E-01 | NOT IDENT. |
| PA-234M | 1.239E+00  | 4.417E+00 | 3.614E+00 | 2.253E+00 | NOT IDENT. |
| NP-239  | 1.282E-01  | 3.246E-01 | 2.843E-01 | 1.656E-01 | FAIL ABUN  |
| AM-241  | 1.155E-01  | 6.129E-02 | 4.963E-02 | 3.127E-02 | NOT IDENT. |
| CM-247  | 5.268E-03  | 3.826E-02 | 2.872E-02 | 1.952E-02 | FAIL ABUN  |
| CF-249  | 1.293E-02  | 3.703E-02 | 3.230E-02 | 1.889E-02 | NOT IDENT. |

CF-251

-3.270E-02

1.122E-01

9.476E-02

5.724E-02 NOT IDENT.

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 SAVAGE ROAD                        *
*                                     CHARLESTON ,SC 29417                     *
*                                     GAMMA SPECTROSCOPY BACKGROUND REPORT      *
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| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 1172.7506  |
| 49.72  | 1373.0491  |
| 57.36  | 0.0000     |
| 59.54  | 1448.7147  |
| 63.29  | 1800.4136  |
| 63.29  | 1800.4136  |
| 64.28  | 1850.8049  |
| 67.75  | 1875.5461  |
| 69.67  | 1897.8159  |
| 70.83  | 1821.9912  |
| 72.81  | 1690.9122  |
| 72.87  | 1691.0493  |
| 72.87  | 1691.0493  |
| 74.82  | 1695.3923  |
| 74.82  | 1695.3923  |
| 74.82  | 1695.3923  |
| 74.97  | 1695.7189  |
| 77.11  | 1700.4144  |
| 77.11  | 1700.4144  |
| 77.11  | 1700.4144  |
| 79.69  | 1705.9917  |
| 79.80  | 1706.2268  |
| 80.12  | 1706.9126  |
| 80.19  | 1707.0627  |
| 80.57  | 1380.6633  |
| 81.00  | 1381.4025  |
| 81.07  | 1381.5239  |
| 81.07  | 1381.5239  |
| 83.79  | 1241.9347  |
| 83.79  | 1241.9347  |
| 85.43  | 1241.1925  |
| 86.48  | 1242.7589  |
| 86.55  | 1242.8627  |
| 86.79  | 1243.2166  |
| 86.94  | 1243.4430  |
| 87.57  | 1244.3724  |
| 88.03  | 1245.0519  |
| 88.47  | 1245.6982  |
| 89.96  | 1247.8779  |
| 91.11  | 1249.5529  |
| 92.59  | 1251.6854  |
| 92.59  | 1251.6854  |
| 93.35  | 1252.7753  |
| 94.67  | 1254.6577  |
| 94.87  | 1258.1877  |
| 94.87  | 1258.1877  |
| 95.86  | 1214.0847  |
| 97.43  | 1014.3295  |
| 98.44  | 992.6470   |
| 99.53  | 1014.5112  |
| 100.11 | 1088.6393  |
| 103.18 | 1140.3287  |
| 103.37 | 1038.9606  |
| 105.31 | 1011.9642  |
| 106.12 | 1084.7380  |
| 109.28 | 969.6042   |
| 111.00 | 1055.1616  |
| 111.76 | 1036.3524  |
| 116.30 | 989.2195   |
| 117.23 | 938.1873   |
| 121.12 | 943.8694   |
| 121.78 | 930.9066   |
| 122.06 | 957.6073   |
| 123.07 | 981.3906   |
| 131.20 | 1007.4898  |
| 133.52 | 1019.7809  |
| 136.00 | 953.9776   |

|        |           |
|--------|-----------|
| 136.47 | 992.4743  |
| 140.51 | 1066.1602 |
| 140.51 | 0.0000    |
| 143.76 | 970.1755  |
| 144.24 | 930.0935  |
| 144.24 | 930.0935  |
| 145.44 | 990.7977  |
| 152.43 | 946.3170  |
| 153.25 | 901.8759  |
| 154.21 | 904.7491  |
| 154.21 | 904.7491  |
| 156.02 | 995.4378  |
| 158.56 | 953.3188  |
| 159.00 | 939.6383  |
| 162.66 | 920.8086  |
| 163.33 | 899.6561  |
| 165.86 | 887.3795  |
| 176.60 | 836.9055  |
| 177.52 | 800.2730  |
| 181.07 | 800.9001  |
| 184.41 | 793.4509  |
| 185.72 | 794.2266  |
| 193.51 | 829.8076  |
| 197.04 | 858.5789  |
| 205.31 | 788.3144  |
| 210.85 | 714.1846  |
| 215.65 | 709.3203  |
| 222.11 | 716.9187  |
| 227.38 | 683.1232  |
| 228.16 | 698.9028  |
| 228.18 | 698.9122  |
| 235.69 | 738.7888  |
| 235.96 | 738.9174  |
| 235.96 | 738.9174  |
| 238.63 | 646.9661  |
| 238.63 | 646.9661  |
| 240.99 | 647.9298  |
| 242.00 | 615.0685  |
| 244.70 | 490.7476  |
| 252.40 | 529.9483  |
| 252.80 | 548.5156  |
| 256.23 | 575.5240  |
| 256.23 | 575.5240  |
| 260.90 | 0.0000    |
| 264.66 | 504.4669  |
| 268.22 | 558.2520  |
| 269.46 | 508.6086  |
| 269.46 | 508.6086  |
| 271.23 | 568.5540  |
| 273.65 | 569.3507  |
| 276.40 | 542.2136  |
| 277.37 | 487.5647  |
| 277.60 | 487.6284  |
| 278.00 | 458.4957  |
| 279.20 | 486.9033  |
| 279.54 | 493.2421  |
| 280.46 | 516.9249  |
| 283.69 | 528.3794  |
| 284.31 | 520.0126  |
| 285.41 | 498.0201  |
| 285.90 | 0.0000    |
| 287.50 | 491.8827  |
| 293.27 | 0.0000    |
| 295.22 | 506.4127  |
| 295.96 | 506.6221  |
| 298.57 | 507.3483  |
| 299.98 | 495.7357  |
| 299.98 | 495.7357  |
| 300.09 | 495.7676  |
| 300.09 | 495.7676  |
| 300.13 | 495.7804  |
| 301.36 | 492.9526  |
| 302.85 | 491.7713  |
| 304.50 | 476.3813  |
| 304.50 | 476.3813  |
| 304.85 | 465.3923  |
| 308.46 | 472.0052  |
| 311.90 | 451.8970  |



|        |          |
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| 316.51 | 463.5089 |
| 319.41 | 442.1992 |
| 320.08 | 450.0112 |
| 323.87 | 465.2910 |
| 323.87 | 465.2910 |
| 328.76 | 520.9707 |
| 333.37 | 457.9239 |
| 334.37 | 501.5601 |
| 334.37 | 501.5601 |
| 338.28 | 431.0335 |
| 338.28 | 431.0335 |
| 338.32 | 431.0444 |
| 338.32 | 431.0444 |
| 338.32 | 431.0444 |
| 340.48 | 409.5822 |
| 340.55 | 409.5977 |
| 344.28 | 479.8273 |
| 351.06 | 422.1116 |
| 351.93 | 376.2354 |
| 356.01 | 362.3569 |
| 364.49 | 372.0029 |
| 366.42 | 357.6483 |
| 383.85 | 376.3910 |
| 388.16 | 396.9322 |
| 388.63 | 389.0997 |
| 391.69 | 375.7615 |
| 400.66 | 355.0558 |
| 401.81 | 343.6229 |
| 402.40 | 360.3157 |
| 404.85 | 360.7086 |
| 410.95 | 351.6881 |
| 414.70 | 388.9970 |
| 423.72 | 319.7934 |
| 427.09 | 340.4013 |
| 427.87 | 349.5839 |
| 433.94 | 333.3193 |
| 453.88 | 261.9046 |
| 463.37 | 296.5208 |
| 468.07 | 290.2541 |
| 473.00 | 285.3572 |
| 476.78 | 318.6847 |
| 477.60 | 284.8515 |
| 487.02 | 259.0766 |
| 492.35 | 0.0000   |
| 497.08 | 269.4231 |
| 511.00 | 236.4851 |
| 514.00 | 234.6680 |
| 527.90 | 0.0000   |
| 529.87 | 0.0000   |
| 531.02 | 281.3018 |
| 537.26 | 245.1221 |
| 546.56 | 0.0000   |
| 563.25 | 221.9451 |
| 569.33 | 253.2875 |
| 569.50 | 253.2992 |
| 569.70 | 250.1235 |
| 583.19 | 241.6810 |
| 600.60 | 252.0402 |
| 602.73 | 245.8151 |
| 604.72 | 228.0274 |
| 609.32 | 239.5280 |
| 609.32 | 239.5280 |
| 610.33 | 251.8416 |
| 614.28 | 221.5562 |
| 618.01 | 259.7051 |
| 621.93 | 210.1982 |
| 621.93 | 210.1982 |
| 633.25 | 235.9981 |
| 635.95 | 247.0897 |
| 636.99 | 242.8174 |
| 645.85 | 239.1463 |
| 657.76 | 210.4641 |
| 661.66 | 245.8477 |
| 661.66 | 245.8477 |
| 664.57 | 0.0000   |
| 666.33 | 208.8376 |
| 666.50 | 208.8469 |
| 677.62 | 216.9311 |

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| 685.70  | 188.9093 |
| 695.00  | 197.7645 |
| 696.49  | 232.0647 |
| 696.51  | 232.0647 |
| 697.00  | 235.7993 |
| 702.65  | 226.9410 |
| 706.68  | 233.7122 |
| 711.68  | 221.0623 |
| 720.70  | 217.1342 |
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| 722.78  | 226.8573 |
| 722.91  | 231.6551 |
| 723.31  | 247.6637 |
| 724.19  | 249.3269 |
| 727.33  | 177.5683 |
| 733.00  | 215.9233 |
| 735.93  | 179.6250 |
| 739.50  | 203.2256 |
| 747.24  | 199.9302 |
| 752.31  | 193.6447 |
| 753.82  | 194.6689 |
| 756.73  | 217.4225 |
| 763.94  | 221.5069 |
| 765.81  | 223.2441 |
| 766.42  | 239.4625 |
| 777.92  | 202.6408 |
| 778.90  | 197.0143 |
| 783.70  | 183.0539 |
| 785.37  | 192.5390 |
| 795.86  | 158.2509 |
| 801.95  | 212.2654 |
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| 810.76  | 196.8551 |
| 815.77  | 150.2347 |
| 818.51  | 154.1770 |
| 832.01  | 203.7576 |
| 834.85  | 215.4551 |
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| 846.77  | 144.7388 |
| 856.80  | 154.2453 |
| 860.56  | 159.7934 |
| 871.09  | 161.0277 |
| 873.19  | 173.9234 |
| 875.33  | 0.0000   |
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| 880.51  | 156.7287 |
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| 884.68  | 156.8990 |
| 889.28  | 148.3014 |
| 898.04  | 157.4329 |
| 911.20  | 160.9037 |
| 911.20  | 160.9037 |
| 911.20  | 160.9037 |
| 926.50  | 172.2139 |
| 937.49  | 140.5141 |
| 944.13  | 160.2466 |
| 946.00  | 155.3710 |
| 949.00  | 161.4281 |
| 962.29  | 137.9616 |
| 964.08  | 152.0786 |
| 966.15  | 152.1564 |
| 968.97  | 152.2592 |
| 968.97  | 152.2592 |
| 968.97  | 152.2592 |
| 983.53  | 152.7883 |
| 996.26  | 154.2538 |
| 1001.03 | 136.3763 |
| 1004.73 | 167.6082 |
| 1037.84 | 135.5212 |
| 1038.76 | 0.0000   |
| 1048.07 | 155.0980 |
| 1050.41 | 163.2929 |
| 1050.41 | 163.2929 |
| 1063.66 | 157.6805 |
| 1085.87 | 153.3508 |
| 1099.45 | 186.6211 |
| 1112.07 | 174.2865 |
| 1115.54 | 167.5820 |

|         |          |
|---------|----------|
| 1120.29 | 162.4568 |
| 1120.29 | 162.4568 |
| 1120.55 | 162.4632 |
| 1121.30 | 153.6579 |
| 1131.51 | 0.0000   |
| 1173.23 | 167.7149 |
| 1177.93 | 194.9895 |
| 1189.05 | 182.8969 |
| 1204.77 | 181.3910 |
| 1221.41 | 218.8333 |
| 1231.02 | 202.3906 |
| 1235.36 | 215.2310 |
| 1238.28 | 161.0642 |
| 1260.41 | 0.0000   |
| 1271.85 | 130.7175 |
| 1274.44 | 146.7317 |
| 1274.54 | 146.7317 |
| 1291.59 | 117.3539 |
| 1298.22 | 0.0000   |
| 1312.11 | 100.6821 |
| 1332.49 | 81.7179  |
| 1365.19 | 67.0758  |
| 1368.63 | 0.0000   |
| 1384.29 | 76.5443  |
| 1408.01 | 71.0353  |
| 1457.56 | 0.0000   |
| 1460.82 | 66.9934  |
| 1489.16 | 61.6380  |
| 1505.03 | 68.4643  |
| 1596.21 | 32.1089  |
| 1620.50 | 45.8113  |
| 1678.03 | 0.0000   |
| 1690.97 | 29.4182  |
| 1764.49 | 34.7168  |
| 1764.49 | 34.7168  |
| 1770.23 | 19.1110  |
| 1771.35 | 22.5897  |
| 1791.20 | 0.0000   |
| 1836.06 | 25.0671  |

TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G247964003

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 4.9056E+00 | ug/g |
| Total Uranium Counting Unc. | 2.5323E+00 | ug/g |
| Total Uranium Tpu           | 1.2920E-06 | ug/g |
| Total Uranium Mda           | 1.4753E+00 | ug/g |

```

*****
*
*               GEL Laboratories LLC               *
*               2040 SAVAGE ROAD                   *
*               CHARLESTON ,SC 29417               *
*               GROSS GAMMA REPORT                 *
*
*****
*
*  BATCH ID      : 958216          SAMPLE ID   : G247964003   *
*  ANALYST       : MXR1            DETECTOR    : GAM05        *
*  SAMPLE DATE   : 19-FEB-2010 12:00:00.00  COUNT TIME : 0 04:00:00.00 *
*  ANALYSIS DATE: 10-MAR-2010 23:08:59.24  SAMPLE ALQT: 132.370 GRAM *
*
*****

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GROSS GAMMA ACTIVITY (pCi/GRAM ) : 1.434E+01
GROSS GAMMA ERROR   (pCi/GRAM ) : 1.447E+00
GROSS GAMMA MDA     (pCi/GRAM ) : 4.652E+00
GROSS GAMMA DLC     (pCi/GRAM ) : 2.291E+00

```

## VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 03:10:21.90

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                   *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964004.CNF;1
Sample date        : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:09:39
Sample ID          : G247964004 Sample quantity : 1.42620E+02 GRAM
Detector name      : GAM13 Detector geometry: CAN
Elapsed live time  : 0 04:00:00.00 Elapsed real time: 0 04:00:04.28 0.0%
Energy tolerance   : 1.50000 keV Analyst Initials : MXR1
Abundance limit    : 75.00000 Sensitivity : 5.00000
Batch ID           : 958216 Detector SN# :
Matrix Spike ID    : LCS ID : 1032-A
*****

```

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|------|----|----------|------|----------|
| 1  | 0  | 46.42*   | 362  | 1605  | 1.17 | 92.39   | 88   | 10 | 2.51E-02 | 22.3 |          |
| 2  | 0  | 63.32*   | 509  | 2226  | 1.17 | 126.18  | 122  | 10 | 3.53E-02 | 19.2 |          |
| 3  | 3  | 74.84    | 2022 | 1982  | 1.27 | 149.22  | 142  | 24 | 1.40E-01 | 4.4  | 2.21E+00 |
| 4  | 3  | 77.09*   | 2958 | 1618  | 1.12 | 153.72  | 142  | 24 | 2.05E-01 | 3.1  |          |
| 5  | 3  | 87.24    | 986  | 1305  | 1.16 | 174.00  | 165  | 29 | 6.85E-02 | 6.8  | 2.98E+00 |
| 6  | 3  | 89.96    | 672  | 1214  | 1.19 | 179.45  | 165  | 29 | 4.67E-02 | 9.5  |          |
| 7  | 3  | 92.70*   | 1024 | 1249  | 1.35 | 184.93  | 165  | 29 | 7.11E-02 | 8.1  |          |
| 8  | 0  | 99.24*   | 273  | 1594  | 2.30 | 198.01  | 193  | 12 | 1.90E-02 | 30.5 |          |
| 9  | 0  | 105.59   | 184  | 1079  | 1.60 | 210.71  | 207  | 8  | 1.28E-02 | 31.7 |          |
| 10 | 0  | 128.97   | 361  | 1395  | 1.54 | 257.47  | 252  | 11 | 2.51E-02 | 20.8 |          |
| 11 | 0  | 185.83*  | 588  | 906   | 1.32 | 371.18  | 367  | 9  | 4.08E-02 | 11.2 |          |
| 12 | 0  | 209.27*  | 263  | 881   | 1.29 | 418.06  | 414  | 9  | 1.83E-02 | 21.7 |          |
| 13 | 3  | 238.59*  | 3610 | 633   | 1.30 | 476.71  | 469  | 19 | 2.51E-01 | 2.1  | 1.04E+00 |
| 14 | 3  | 241.56*  | 771  | 759   | 1.66 | 482.64  | 469  | 19 | 5.36E-02 | 8.7  |          |
| 15 | 0  | 270.17*  | 288  | 722   | 1.52 | 539.87  | 534  | 11 | 2.00E-02 | 19.6 |          |
| 16 | 0  | 277.46   | 164  | 614   | 1.32 | 554.44  | 550  | 10 | 1.14E-02 | 29.5 |          |
| 17 | 0  | 295.19*  | 1159 | 660   | 1.53 | 589.90  | 584  | 12 | 8.05E-02 | 5.4  |          |
| 18 | 0  | 299.96*  | 213  | 521   | 1.41 | 599.44  | 596  | 9  | 1.48E-02 | 21.1 |          |
| 19 | 0  | 327.91   | 183  | 526   | 1.44 | 655.34  | 652  | 10 | 1.27E-02 | 24.4 |          |
| 20 | 0  | 338.20*  | 622  | 601   | 1.43 | 675.91  | 671  | 11 | 4.32E-02 | 8.9  |          |
| 21 | 0  | 351.83*  | 1867 | 582   | 1.47 | 703.18  | 697  | 12 | 1.30E-01 | 3.6  |          |
| 22 | 0  | 408.91   | 93   | 349   | 1.06 | 817.34  | 813  | 9  | 6.43E-03 | 37.8 |          |
| 23 | 0  | 462.94   | 247  | 379   | 1.49 | 925.41  | 920  | 12 | 1.72E-02 | 17.0 |          |
| 24 | 0  | 510.68*  | 461  | 441   | 1.89 | 1020.88 | 1013 | 17 | 3.20E-02 | 13.0 |          |
| 25 | 0  | 582.97*  | 1102 | 392   | 1.72 | 1165.48 | 1158 | 14 | 7.66E-02 | 5.0  |          |
| 26 | 0  | 609.07   | 1404 | 426   | 1.51 | 1217.68 | 1210 | 16 | 9.75E-02 | 4.2  |          |
| 27 | 0  | 727.07   | 246  | 233   | 1.59 | 1453.69 | 1448 | 12 | 1.71E-02 | 14.0 |          |
| 28 | 0  | 769.67   | 224  | 342   | 1.87 | 1538.89 | 1529 | 19 | 1.55E-02 | 21.0 |          |
| 29 | 0  | 794.80   | 166  | 328   | 0.91 | 1589.16 | 1580 | 19 | 1.15E-02 | 27.4 |          |
| 30 | 0  | 860.08*  | 116  | 192   | 1.96 | 1719.73 | 1715 | 12 | 8.06E-03 | 26.9 |          |
| 31 | 0  | 911.02*  | 790  | 263   | 1.99 | 1821.63 | 1813 | 17 | 5.48E-02 | 6.0  |          |
| 32 | 1  | 964.50   | 189  | 184   | 2.22 | 1928.60 | 1922 | 24 | 1.31E-02 | 16.4 | 2.62E+00 |
| 33 | 1  | 968.81*  | 415  | 161   | 1.91 | 1937.22 | 1922 | 24 | 2.88E-02 | 8.1  |          |
| 34 | 0  | 1120.09* | 308  | 231   | 1.99 | 2239.83 | 2232 | 15 | 2.14E-02 | 12.5 |          |
| 35 | 0  | 1237.93  | 214  | 189   | 1.74 | 2475.55 | 2468 | 15 | 1.48E-02 | 15.7 |          |
| 36 | 0  | 1377.88  | 63   | 83    | 1.34 | 2755.52 | 2750 | 11 | 4.36E-03 | 31.1 |          |
| 37 | 0  | 1401.51  | 44   | 97    | 1.50 | 2802.78 | 2794 | 16 | 3.09E-03 | 51.6 |          |
| 38 | 0  | 1460.37  | 2851 | 138   | 2.34 | 2920.53 | 2911 | 19 | 1.98E-01 | 2.1  |          |

| Pk | It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 39 | 0  | 1764.08 | 276  | 53    | 2.26 | 3528.13 | 3520 | 19 | 1.92E-02 | 8.7  |     |

Flag: "\*" = Peak area was modified by background subtraction

## VMS Nuclide Identification Report V3.1 Generated 11-MAR-2010 03:10:25

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964004.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8
Sample title      : MXR1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:09:39
Sample ID         : G247964004 Sample quantity : 142.62 GRAM
Sample type       : SOLID Sample geometry :
Detector name     : GAMMA13 Detector geometry: CAN
Elapsed live time : 0 04:00:00.00 Elapsed real time: 0 04:00:04.28 0.0%
Peak Width (FWHM): 3.00 Confidence level : 5.00 %
Energy tolerance : 1.50 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 0.00 %
Efficiency type : Empirical Efficiencies at : Peak Energy
Abundance limit : 75.00 WTM error limit : 3.00

```

## Full Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| K-40    | +         | 1460.82      | *   | 3.510E+01           | 3.474E+00 | 5.816E-01      | 5.203E-02 | 60.348  |
| CD-109  | +         | 88.03        | *   | 4.957E+00           | 8.372E-01 | 8.176E-01      | 8.266E-02 | 6.063   |
| SN-126  | +         | 64.28        |     | 9.443E-01           | 3.943E-01 | 3.301E-01      | 5.368E-02 | 2.860   |
|         | +         | 86.94        |     | 2.001E+00           | 8.772E-01 | 3.290E-01      | 1.372E-01 | 6.083   |
|         | +         | 87.57        | *   | 4.814E-01           | 8.130E-02 | 7.929E-02      | 8.014E-03 | 6.072   |
| EU-155  | +         | 86.55        |     | 5.847E-01           | 9.901E-02 | 9.602E-02      | 9.779E-03 | 6.089   |
|         | +         | 105.31       | *   | 1.662E-01           | 1.071E-01 | 1.325E-01      | 1.494E-02 | 1.254   |
| TL-208  | +         | 277.37       |     | 7.967E-01           | 4.817E-01 | 5.282E-01      | 6.899E-02 | 1.509   |
|         | +         | 583.19       | *   | 7.746E-01           | 1.072E-01 | 5.591E-02      | 5.389E-03 | 13.855  |
|         | +         | 860.56       |     | 7.826E-01           | 4.274E-01 | 4.467E-01      | 4.120E-02 | 1.752   |
| PB-210  | +         | 46.54        | *   | 1.624E+00           | 7.456E-01 | 6.531E-01      | 7.148E-02 | 2.486   |
| BI-211  |           | 72.87        |     | 8.706E+00           | 2.185E+00 | 3.156E+00      | 3.221E-01 | 2.759   |
|         | +         | 351.06       | *   | 5.597E+00           | 6.658E-01 | 3.125E-01      | 2.978E-02 | 17.908  |
| PB-212  | +         | 74.82        |     | 3.494E+00           | 5.819E-01 | 3.231E-01      | 4.549E-02 | 10.815  |
|         | +         | 77.11        |     | 3.079E+00           | 3.673E-01 | 1.951E-01      | 1.981E-02 | 15.784  |
|         | +         | 238.63       | *   | 2.382E+00           | 2.660E-01 | 7.991E-02      | 8.255E-03 | 29.812  |
|         | +         | 300.09       |     | 2.202E+00           | 9.607E-01 | 1.105E+00      | 1.234E-01 | 1.992   |
| BI-214  | +         | 609.32       | *   | 1.917E+00           | 2.570E-01 | 1.148E-01      | 1.194E-02 | 16.699  |
|         | +         | 1120.29      |     | 2.184E+00           | 5.923E-01 | 4.964E-01      | 5.262E-02 | 4.399   |
|         | +         | 1764.49      |     | 2.729E+00           | 5.275E-01 | 3.176E-01      | 2.670E-02 | 8.594   |
| PB-214  | +         | 74.82        |     | 6.193E+00           | 9.706E-01 | 5.726E-01      | 7.390E-02 | 10.815  |
|         | +         | 77.11        |     | 5.428E+00           | 7.872E-01 | 3.439E-01      | 4.499E-02 | 15.784  |
|         | +         | 242.00       |     | 3.088E+00           | 6.355E-01 | 4.633E-01      | 5.066E-02 | 6.665   |
|         | +         | 295.22       |     | 2.119E+00           | 3.339E-01 | 1.945E-01      | 2.221E-02 | 10.894  |
|         | +         | 351.93       | *   | 2.031E+00           | 2.664E-01 | 1.137E-01      | 1.251E-02 | 17.866  |
| RA-224  | +         | 240.99       | *   | 5.460E+00           | 1.078E+00 | 8.567E-01      | 7.940E-02 | 6.373   |
| RA-226  | +         | 609.32       | *   | 1.917E+00           | 2.570E-01 | 1.148E-01      | 1.194E-02 | 16.699  |
|         | +         | 1120.29      |     | 2.184E+00           | 5.923E-01 | 4.964E-01      | 5.262E-02 | 4.399   |
|         | +         | 1764.49      |     | 2.729E+00           | 5.275E-01 | 3.176E-01      | 2.670E-02 | 8.594   |
| AC-228  | +         | 338.32       |     | 2.069E+00           | 9.412E-01 | 3.479E-01      | 1.456E-01 | 5.947   |
|         | +         | 911.20       | *   | 2.712E+00           | 4.514E-01 | 2.340E-01      | 2.685E-02 | 11.591  |
|         | +         | 968.97       |     | 2.457E+00           | 7.164E-01 | 3.927E-01      | 9.544E-02 | 6.256   |
| RA-228  | +         | 338.32       |     | 2.069E+00           | 9.412E-01 | 3.479E-01      | 1.456E-01 | 5.947   |
|         | +         | 911.20       | *   | 2.712E+00           | 4.514E-01 | 2.340E-01      | 2.685E-02 | 11.591  |



Sample ID : G247964004

Acquisition date : 10-MAR-2010 23:09:39

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TH-228  | +         | 968.97       |     | 2.457E+00           | 7.164E-01 | 3.927E-01      | 9.544E-02 | 6.256   |
|         | +         | 74.82        |     | 3.494E+00           | 4.740E-01 | 3.231E-01      | 3.311E-02 | 10.815  |
|         | +         | 77.11        |     | 3.079E+00           | 3.673E-01 | 1.951E-01      | 1.981E-02 | 15.784  |
|         | +         | 238.63       | *   | 2.382E+00           | 2.660E-01 | 7.991E-02      | 8.255E-03 | 29.812  |
|         | +         | 300.09       |     | 2.202E+00           | 1.639E+00 | 1.105E+00      | 6.780E-01 | 1.992   |
| TH-232  | +         | 338.32       |     | 2.069E+00           | 4.155E-01 | 3.479E-01      | 3.204E-02 | 5.947   |
|         | +         | 911.20       | *   | 2.712E+00           | 4.514E-01 | 2.340E-01      | 2.685E-02 | 11.591  |
|         | +         | 968.97       |     | 2.457E+00           | 7.164E-01 | 3.927E-01      | 9.544E-02 | 6.256   |
| TH-234  | +         | 63.29        | *   | 2.450E+00           | 1.054E+00 | 8.565E-01      | 1.651E-01 | 2.861   |
|         | +         | 92.59        |     | 4.422E+00           | 1.239E+00 | 7.043E-01      | 1.607E-01 | 6.278   |
| U-235   | +         | 89.96        |     | 3.517E+00           | 1.112E+00 | 8.515E-01      | 2.147E-01 | 4.131   |
|         | +         | 93.35        |     | 3.340E+00           | 9.629E-01 | 5.333E-01      | 1.271E-01 | 6.263   |
|         |           | 143.76       | *   | 3.020E-02           | 1.773E-01 | 2.887E-01      | 5.228E-02 | 0.105   |
|         |           | 163.33       |     | 3.711E-01           | 3.944E-01 | 6.272E-01      | 1.134E-01 | 0.592   |
|         | +         | 185.72       |     | 2.510E-01           | 6.061E-02 | 5.808E-02      | 5.136E-03 | 4.321   |
|         |           | 205.31       |     | 9.726E-02           | 4.938E-01 | 7.062E-01      | 1.295E-01 | 0.138   |
| NP-237  | +         | 86.48        | *   | 1.436E+00           | 3.867E-01 | 2.358E-01      | 5.490E-02 | 6.091   |
|         |           | 95.86        |     | 1.246E+00           | 9.230E-01 | 1.040E+00      | 2.575E-01 | 1.198   |
| U-238   | +         | 63.29        | *   | 2.450E+00           | 1.054E+00 | 8.565E-01      | 1.651E-01 | 2.861   |
|         | +         | 92.59        |     | 4.422E+00           | 8.528E-01 | 7.043E-01      | 7.306E-02 | 6.278   |
| ANH-511 | +         | 511.00       | *   | 2.450E-01           | 6.748E-02 | 4.495E-02      | 4.102E-03 | 5.452   |

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| BE-7    |           | 477.60       | *   | -7.300E-02          | 3.210E-01 | 5.262E-01           | 5.106E-02 | -0.139  |
| NA-22   |           | 1274.54      | *   | 1.431E-02           | 4.312E-02 | 7.306E-02           | 6.173E-03 | 0.196   |
| NA-24   |           | 1368.63      | *   | 2.478E+01           | 4.312E-02 | Half-Life too short |           |         |
| SC-46   |           | 889.28       | *   | 4.675E-03           | 4.125E-02 | 6.851E-02           | 5.816E-03 | 0.068   |
|         | +         | 1120.55      |     | 3.830E-01           | 1.007E-01 | 1.306E-01           | 1.072E-02 | 2.933   |
| V-48    |           | 944.13       |     | -1.260E-01          | 1.117E+00 | 1.825E+00           | 1.546E-01 | -0.069  |
|         |           | 983.53       | *   | -4.156E-02          | 8.783E-02 | 1.403E-01           | 1.186E-02 | -0.296  |
|         |           | 1312.11      |     | -1.233E-01          | 9.790E-02 | 1.498E-01           | 1.285E-02 | -0.823  |
| CR-51   |           | 320.08       | *   | 2.931E-01           | 3.736E-01 | 6.145E-01           | 5.977E-02 | 0.477   |
| MN-54   |           | 834.85       | *   | 1.653E-02           | 3.721E-02 | 6.293E-02           | 5.450E-03 | 0.263   |
| CO-56   |           | 846.77       | *   | 8.831E-03           | 3.984E-02 | 6.676E-02           | 5.761E-03 | 0.132   |
|         |           | 1037.84      |     | -1.091E-01          | 3.336E-01 | 5.347E-01           | 4.736E-02 | -0.204  |
|         | +         | 1238.28      |     | 4.378E-01           | 1.421E-01 | 1.843E-01           | 1.578E-02 | 2.375   |
|         |           | 1771.35      |     | 7.140E-02           | 2.536E-01 | 3.651E-01           | 3.064E-02 | 0.196   |
| CO-57   |           | 122.06       | *   | -1.030E-02          | 2.135E-02 | 3.411E-02           | 4.244E-03 | -0.302  |
|         |           | 136.47       |     | -2.880E-02          | 1.736E-01 | 2.918E-01           | 3.447E-02 | -0.099  |
| CO-58   |           | 810.76       | *   | -3.336E-02          | 4.232E-02 | 6.777E-02           | 5.918E-03 | -0.492  |
| FE-59   |           | 1099.45      | *   | -5.593E-02          | 1.030E-01 | 1.624E-01           | 1.461E-02 | -0.344  |
|         |           | 1291.59      |     | -3.801E-02          | 1.349E-01 | 2.210E-01           | 2.140E-02 | -0.172  |
| CO-60   |           | 1173.23      |     | 1.830E-02           | 4.510E-02 | 7.432E-02           | 5.976E-03 | 0.246   |
|         |           | 1332.49      | *   | 2.249E-02           | 3.951E-02 | 6.772E-02           | 5.857E-03 | 0.332   |
| ZN-65   |           | 1115.54      | *   | 1.166E-01           | 1.067E-01 | 1.591E-01           | 1.310E-02 | 0.733   |
| SE-75   |           | 121.12       |     | 1.134E-02           | 1.127E-01 | 1.827E-01           | 2.593E-02 | 0.062   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
|         |           | 136.00       |     | -2.898E-03          | 3.372E-02 | 5.680E-02           | 6.479E-03 | -0.051  |
|         |           | 264.66       | *   | 9.829E-03           | 4.610E-02 | 6.618E-02           | 6.218E-03 | 0.149   |
|         |           | 279.54       |     | 8.479E-02           | 1.129E-01 | 1.647E-01           | 1.595E-02 | 0.515   |
|         |           | 400.66       |     | 4.981E-03           | 2.402E-01 | 4.024E-01           | 4.494E-02 | 0.012   |
| SR-85   |           | 514.00       | *   | 1.206E-01           | 4.492E-02 | 7.049E-02           | 6.436E-03 | 1.711   |
| Y-88    |           | 898.04       |     | -2.657E-02          | 4.550E-02 | 7.297E-02           | 6.201E-03 | -0.364  |
|         |           | 1836.06      | *   | 8.441E-03           | 3.288E-02 | 5.627E-02           | 4.650E-03 | 0.150   |
| Y-91    |           | 1204.77      | *   | -1.705E+01          | 2.196E+01 | 3.534E+01           | 2.887E+00 | -0.483  |
| NB-94   |           | 702.65       | *   | 6.927E-03           | 3.565E-02 | 5.777E-02           | 5.052E-03 | 0.120   |
|         |           | 871.09       |     | 3.957E-02           | 3.582E-02 | 6.199E-02           | 5.303E-03 | 0.638   |
| NB-95   |           | 765.81       | *   | 8.104E-02           | 5.208E-02 | 8.089E-02           | 7.089E-03 | 1.002   |
| NB-95M  |           | 235.69       | *   | 3.671E-01           | 1.361E-01 | 2.053E-01           | 2.141E-02 | 1.788   |
| ZR-95   |           | 724.19       |     | 1.335E-01           | 1.163E-01 | 1.777E-01           | 1.685E-02 | 0.751   |
|         |           | 756.73       | *   | 3.652E-02           | 7.812E-02 | 1.330E-01           | 1.284E-02 | 0.275   |
| MO-99   |           | 140.51       |     | -7.158E+01          | 5.826E+01 | 9.095E+01           | 2.247E+01 | -0.787  |
|         |           | 181.07       |     | 8.580E+00           | 5.106E+01 | 7.505E+01           | 1.416E+01 | 0.114   |
|         |           | 366.42       |     | -8.378E+01          | 2.618E+02 | 4.359E+02           | 3.910E+01 | -0.192  |
|         |           | 739.50       | *   | -1.050E+01          | 3.654E+01 | 6.039E+01           | 9.567E+00 | -0.174  |
|         |           | 777.92       |     | -1.066E+02          | 1.209E+02 | 1.708E+02           | 1.496E+01 | -0.624  |
| TC-99M  |           | 140.51       | *   | -7.499E+15          | 1.209E+02 | Half-Life too short |           |         |
| RU-103  |           | 497.08       | *   | -4.034E-03          | 4.084E-02 | 6.709E-02           | 9.577E-03 | -0.060  |
|         | +         | 610.33       |     | 2.138E+01           | 3.970E+00 | 2.895E+00           | 4.786E-01 | 7.383   |
| RH-106  |           | 621.93       | *   | -1.933E-01          | 3.100E-01 | 4.867E-01           | 6.545E-02 | -0.397  |
|         |           | 1050.41      |     | 2.371E+00           | 2.714E+00 | 4.603E+00           | 3.855E-01 | 0.515   |
| RU-106  |           | 621.93       | *   | -1.933E-01          | 3.093E-01 | 4.867E-01           | 4.337E-02 | -0.397  |
|         |           | 1050.41      |     | 2.371E+00           | 2.714E+00 | 4.603E+00           | 3.855E-01 | 0.515   |
| AG-108M |           | 433.94       | *   | -3.382E-02          | 2.768E-02 | 4.376E-02           | 4.016E-03 | -0.773  |
|         |           | 614.28       |     | -8.410E-04          | 4.075E-02 | 5.707E-02           | 5.261E-03 | -0.015  |
|         |           | 722.91       |     | -3.184E-03          | 4.171E-02 | 6.014E-02           | 5.435E-03 | -0.053  |
| AG-110M |           | 657.76       | *   | -1.058E-02          | 3.340E-02 | 5.311E-02           | 4.757E-03 | -0.199  |
|         |           | 677.62       |     | 2.203E-01           | 3.220E-01 | 5.340E-01           | 4.782E-02 | 0.413   |
|         |           | 706.68       |     | -2.960E-03          | 2.292E-01 | 3.679E-01           | 3.309E-02 | -0.008  |
|         |           | 763.94       |     | 1.981E-01           | 1.760E-01 | 2.703E-01           | 2.432E-02 | 0.733   |
|         |           | 884.68       |     | -2.216E-02          | 5.064E-02 | 8.182E-02           | 7.189E-03 | -0.271  |
|         |           | 937.49       |     | -9.461E-02          | 1.142E-01 | 1.796E-01           | 1.579E-02 | -0.527  |
|         |           | 1384.29      |     | -3.552E-02          | 1.797E-01 | 2.489E-01           | 2.219E-02 | -0.143  |
|         |           | 1505.03      |     | -1.012E-01          | 2.884E-01 | 4.614E-01           | 4.014E-02 | -0.219  |
| SN-113  |           | 391.69       | *   | -1.065E-02          | 4.179E-02 | 6.945E-02           | 6.201E-03 | -0.153  |
| CD-115  |           | 260.90       |     | -3.388E-04          | 4.179E-02 | Half-Life too short |           |         |
|         |           | 492.35       |     | 3.605E-05           | 4.179E-02 | Half-Life too short |           |         |
|         |           | 527.90       | *   | -8.940E-06          | 4.179E-02 | Half-Life too short |           |         |
| SN-117M |           | 156.02       |     | 9.786E-01           | 2.384E+00 | 4.028E+00           | 3.869E-01 | 0.243   |
|         |           | 158.56       | *   | 2.109E-02           | 5.698E-02 | 9.617E-02           | 9.003E-03 | 0.219   |
| TE-123M |           | 159.00       | *   | -1.151E-02          | 2.438E-02 | 4.033E-02           | 3.778E-03 | -0.285  |
| SB-124  |           | 602.73       |     | -3.505E-02          | 4.698E-02 | 6.290E-02           | 5.657E-03 | -0.557  |
|         |           | 645.85       |     | -7.402E-02          | 5.054E-01 | 8.119E-01           | 7.524E-02 | -0.091  |
|         |           | 722.78       |     | -3.367E-02          | 4.407E-01 | 6.354E-01           | 5.693E-02 | -0.053  |
|         |           | 1690.97      | *   | 9.384E-02           | 7.893E-02 | 1.424E-01           | 1.267E-02 | 0.659   |
| SB-125  |           | 427.87       | *   | 5.663E-02           | 8.287E-02 | 1.411E-01           | 1.275E-02 | 0.401   |

## ----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         | +         | 463.37       |     | 1.158E+00           | 4.095E-01 | 5.132E-01      | 4.952E-02 | 2.256   |
|         |           | 600.60       |     | 9.510E-02           | 1.845E-01 | 2.894E-01      | 2.782E-02 | 0.329   |
|         |           | 635.95       |     | 3.239E-01           | 2.845E-01 | 4.802E-01      | 4.572E-02 | 0.674   |
| TE-125M |           | 109.28       | *   | 3.031E+00           | 9.345E+00 | 1.330E+01      | 1.721E+00 | 0.228   |
| I-126   |           | 388.63       |     | 1.598E-01           | 1.981E-01 | 3.397E-01      | 2.958E-02 | 0.470   |
|         |           | 666.33       | *   | 3.970E-01           | 2.876E-01 | 4.880E-01      | 4.239E-02 | 0.814   |
|         |           | 753.82       |     | 3.574E+00           | 2.321E+00 | 4.089E+00      | 3.585E-01 | 0.874   |
| SB-126  |           | 414.70       |     | -7.525E-02          | 9.405E-02 | 1.373E-01      | 1.209E-02 | -0.548  |
|         |           | 666.50       |     | 1.439E-01           | 1.001E-01 | 1.702E-01      | 1.478E-02 | 0.846   |
|         |           | 695.00       |     | 1.716E-02           | 1.021E-01 | 1.654E-01      | 1.445E-02 | 0.104   |
|         |           | 697.00       |     | -6.540E-03          | 3.605E-01 | 5.792E-01      | 5.062E-02 | -0.011  |
|         |           | 720.70       | *   | 9.531E-02           | 2.102E-01 | 3.125E-01      | 2.739E-02 | 0.305   |
|         |           | 856.80       |     | 6.906E-01           | 6.800E-01 | 1.032E+00      | 8.876E-02 | 0.669   |
| SB-127  |           | 252.40       |     | -2.682E+00          | 8.146E+00 | 1.303E+01      | 5.480E+00 | -0.206  |
|         |           | 473.00       |     | -1.377E+00          | 3.307E+00 | 5.375E+00      | 7.678E-01 | -0.256  |
|         |           | 685.70       | *   | -2.526E-01          | 2.952E+00 | 4.733E+00      | 6.068E-01 | -0.053  |
|         |           | 783.70       |     | 9.983E+00           | 7.762E+00 | 1.344E+01      | 1.844E+00 | 0.743   |
| I-131   |           | 80.19        |     | -6.514E+00          | 4.988E+00 | 6.669E+00      | 6.809E-01 | -0.977  |
|         |           | 284.31       |     | -1.096E-01          | 1.931E+00 | 3.120E+00      | 3.065E-01 | -0.035  |
|         |           | 364.49       | *   | 3.262E-02           | 1.460E-01 | 2.476E-01      | 2.345E-02 | 0.132   |
|         |           | 636.99       |     | 3.038E+00           | 2.407E+00 | 4.079E+00      | 3.813E-01 | 0.745   |
| TE-132  |           | 49.72        |     | -1.555E+00          | 8.883E+00 | 1.298E+01      | 1.759E+00 | -0.120  |
|         |           | 111.76       |     | -1.168E+02          | 8.089E+01 | 1.124E+02      | 1.643E+01 | -1.039  |
|         |           | 116.30       |     | 5.762E+00           | 6.296E+01 | 9.979E+01      | 1.485E+01 | 0.058   |
|         |           | 228.16       | *   | 7.764E-01           | 1.675E+00 | 2.774E+00      | 4.736E-01 | 0.280   |
| BA-133  |           | 81.00        |     | -1.123E-01          | 7.276E-02 | 9.416E-02      | 1.545E-02 | -1.193  |
|         | +         | 276.40       |     | 7.370E-01           | 4.481E-01 | 5.507E-01      | 8.033E-02 | 1.338   |
|         |           | 302.85       |     | 9.832E-02           | 1.385E-01 | 2.005E-01      | 2.720E-02 | 0.490   |
|         |           | 356.01       | *   | -3.648E-03          | 4.506E-02 | 6.400E-02      | 8.485E-03 | -0.057  |
|         |           | 383.85       |     | -1.841E-01          | 2.788E-01 | 4.567E-01      | 5.721E-02 | -0.403  |
| I-133   |           | 529.87       | *   | -6.604E-02          | 2.788E-01 | Half-Life      | too short |         |
|         |           | 875.33       |     | -6.031E-02          | 2.788E-01 | Half-Life      | too short |         |
|         |           | 1298.22      |     | 5.107E+00           | 2.788E-01 | Half-Life      | too short |         |
| CS-134  |           | 563.25       |     | 3.853E-01           | 3.563E-01 | 6.046E-01      | 5.552E-02 | 0.637   |
|         |           | 569.33       |     | 2.636E-03           | 1.844E-01 | 3.014E-01      | 2.774E-02 | 0.009   |
|         |           | 604.72       |     | -2.668E-02          | 3.763E-02 | 5.044E-02      | 4.543E-03 | -0.529  |
|         | +         | 795.86       | *   | 1.723E-01           | 9.546E-02 | 9.068E-02      | 7.976E-03 | 1.900   |
|         |           | 801.95       |     | -7.764E-02          | 4.796E-01 | 6.808E-01      | 5.974E-02 | -0.114  |
|         |           | 1365.19      |     | -7.101E-02          | 1.205E+00 | 1.989E+00      | 1.804E-01 | -0.036  |
| CS-135  |           | 268.22       | *   | 1.974E-01           | 1.676E-01 | 2.472E-01      | 2.624E-02 | 0.799   |
| I-135   |           | 546.56       |     | 5.349E+13           | 1.676E-01 | Half-Life      | too short |         |
|         |           | 836.80       |     | 1.567E+15           | 1.676E-01 | Half-Life      | too short |         |
|         |           | 1038.76      |     | -2.719E+12          | 1.676E-01 | Half-Life      | too short |         |
|         |           | 1131.51      |     | -3.186E+13          | 1.676E-01 | Half-Life      | too short |         |
|         |           | 1260.41      | *   | -1.204E+14          | 1.676E-01 | Half-Life      | too short |         |
|         |           | 1457.56      |     | 9.165E+16           | 1.676E-01 | Half-Life      | too short |         |
|         |           | 1678.03      |     | 1.955E+14           | 1.676E-01 | Half-Life      | too short |         |
|         |           | 1791.20      |     | 2.179E+14           | 1.676E-01 | Half-Life      | too short |         |
| CS-136  |           | 153.25       |     | 6.213E-01           | 9.256E-01 | 1.570E+00      | 1.780E-01 | 0.396   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         |           | 176.60       |     | 1.243E-01           | 5.321E-01 | 8.907E-01      | 8.579E-02 | 0.140   |
|         |           | 273.65       |     | -4.969E-01          | 9.094E-01 | 8.866E-01      | 8.914E-02 | -0.561  |
|         |           | 340.55       |     | 7.637E-01           | 2.154E-01 | 3.262E-01      | 3.100E-02 | 2.341   |
|         |           | 818.51       |     | -2.647E-02          | 9.016E-02 | 1.477E-01      | 1.287E-02 | -0.179  |
|         |           | 1048.07      | *   | -4.430E-02          | 1.426E-01 | 2.286E-01      | 2.002E-02 | -0.194  |
|         |           | 1235.36      |     | 1.870E+00           | 8.925E-01 | 1.393E+00      | 1.606E-01 | 1.343   |
| BA-137M |           | 661.66       | *   | -3.839E-02          | 3.775E-02 | 5.339E-02      | 4.633E-03 | -0.719  |
| CS-137  |           | 661.66       | *   | -4.055E-02          | 3.988E-02 | 5.640E-02      | 4.903E-03 | -0.719  |
| CE-139  |           | 165.86       | *   | -2.793E-02          | 2.575E-02 | 4.175E-02      | 3.606E-03 | -0.669  |
| BA-140  |           | 162.66       |     | 4.872E-01           | 9.272E-01 | 1.481E+00      | 1.410E-01 | 0.329   |
|         |           | 304.85       |     | 1.711E-01           | 1.703E+00 | 2.406E+00      | 7.098E-01 | 0.071   |
|         |           | 423.72       |     | 3.223E-01           | 2.192E+00 | 3.670E+00      | 1.210E+00 | 0.088   |
|         |           | 537.26       | *   | 3.644E-02           | 3.319E-01 | 5.464E-01      | 1.860E-01 | 0.067   |
| LA-140  | +         | 328.76       |     | 9.570E-01           | 4.760E-01 | 6.257E-01      | 6.085E-02 | 1.530   |
|         |           | 487.02       |     | -6.559E-02          | 1.626E-01 | 2.641E-01      | 2.535E-02 | -0.248  |
|         |           | 815.77       |     | 2.627E-02           | 4.111E-01 | 6.856E-01      | 6.653E-02 | 0.038   |
|         |           | 1596.21      | *   | 1.086E-02           | 1.146E-01 | 1.886E-01      | 1.631E-02 | 0.058   |
| CE-141  |           | 145.44       | *   | 6.644E-02           | 5.855E-02 | 1.001E-01      | 1.070E-02 | 0.664   |
| CE-143  |           | 57.36        |     | 2.330E-03           | 5.855E-02 | Half-Life      | too short |         |
|         |           | 293.27       | *   | 1.061E-02           | 5.855E-02 | Half-Life      | too short |         |
|         |           | 664.57       |     | 7.760E-03           | 5.855E-02 | Half-Life      | too short |         |
|         |           | 721.93       |     | 4.809E-03           | 5.855E-02 | Half-Life      | too short |         |
| CE-144  |           | 80.12        |     | -2.411E+00          | 1.864E+00 | 2.494E+00      | 2.527E-01 | -0.967  |
|         |           | 133.52       | *   | 7.452E-02           | 1.846E-01 | 2.779E-01      | 4.757E-02 | 0.268   |
| PM-144  |           | 476.78       |     | -3.902E-02          | 6.191E-02 | 9.978E-02      | 9.758E-03 | -0.391  |
|         |           | 618.01       |     | 2.410E-03           | 3.303E-02 | 5.232E-02      | 4.795E-03 | 0.046   |
|         |           | 696.49       | *   | 1.479E-02           | 3.582E-02 | 5.861E-02      | 5.124E-03 | 0.252   |
| PR-144  |           | 696.51       | *   | 1.111E+00           | 2.687E+00 | 4.397E+00      | 3.842E-01 | 0.253   |
|         |           | 1489.16      |     | 4.625E+00           | 1.160E+01 | 1.971E+01      | 1.716E+00 | 0.235   |
| PM-146  |           | 453.88       | *   | 4.438E-02           | 3.892E-02 | 6.676E-02      | 7.276E-03 | 0.665   |
|         |           | 633.25       |     | -5.447E-02          | 1.472E+00 | 2.381E+00      | 9.108E-01 | -0.023  |
|         |           | 735.93       |     | -3.456E-02          | 1.422E-01 | 2.353E-01      | 6.606E-02 | -0.147  |
|         |           | 747.24       |     | -9.671E-02          | 9.500E-02 | 1.500E-01      | 2.202E-02 | -0.645  |
| ND-147  | +         | 91.11        |     | 1.503E+00           | 3.294E-01 | 5.455E-01      | 5.943E-02 | 2.755   |
|         |           | 319.41       |     | 6.434E-01           | 3.932E+00 | 6.353E+00      | 5.917E-01 | 0.101   |
|         |           | 531.02       | *   | 7.399E-02           | 7.046E-01 | 1.162E+00      | 1.772E-01 | 0.064   |
| PM-149  |           | 285.90       | *   | 1.330E-04           | 7.046E-01 | Half-Life      | too short |         |
| EU-152  |           | 121.78       |     | -2.502E-02          | 6.083E-02 | 9.739E-02      | 1.299E-02 | -0.257  |
|         |           | 244.70       |     | 5.223E-01           | 3.009E-01 | 4.558E-01      | 4.233E-02 | 1.146   |
|         |           | 344.28       | *   | -1.448E-02          | 1.055E-01 | 1.460E-01      | 1.408E-02 | -0.099  |
|         |           | 778.90       |     | -3.029E-02          | 2.678E-01 | 4.242E-01      | 3.713E-02 | -0.071  |
|         | +         | 964.08       |     | 1.206E+00           | 4.082E-01 | 5.366E-01      | 4.543E-02 | 2.247   |
|         |           | 1085.87      |     | -2.172E-01          | 4.160E-01 | 6.572E-01      | 5.457E-02 | -0.330  |
|         |           | 1112.07      |     | 3.349E-02           | 3.521E-01 | 4.921E-01      | 4.053E-02 | 0.068   |
|         |           | 1408.01      |     | 9.706E-02           | 2.103E-01 | 3.098E-01      | 2.695E-02 | 0.313   |
| GD-153  |           | 69.67        |     | 2.147E-01           | 1.000E+00 | 1.453E+00      | 1.492E-01 | 0.148   |
|         |           | 97.43        | *   | 9.202E-02           | 8.892E-02 | 1.020E-01      | 1.088E-02 | 0.902   |
|         |           | 103.18       |     | 2.927E-02           | 1.210E-01 | 1.357E-01      | 1.499E-02 | 0.216   |
| EU-154  |           | 123.07       |     | -6.184E-03          | 4.412E-02 | 6.931E-02      | 9.984E-03 | -0.089  |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TB-160  | +         | 723.31       | *   | -8.130E-02          | 1.957E-01 | 2.763E-01      | 2.659E-02 | -0.294  |
|         |           | 873.19       |     | 3.415E-01           | 2.963E-01 | 5.112E-01      | 6.054E-02 | 0.668   |
|         |           | 996.26       |     | -7.923E-01          | 4.091E-01 | 5.646E-01      | 9.815E-02 | -1.403  |
|         |           | 1004.73      |     | -2.015E-02          | 2.268E-01 | 3.693E-01      | 4.248E-02 | -0.055  |
|         |           | 1274.44      |     | 3.370E-02           | 1.215E-01 | 2.053E-01      | 2.309E-02 | 0.164   |
|         |           | 86.79        |     | 1.615E+00           | 2.728E-01 | 3.621E-01      | 3.661E-02 | 4.460   |
|         |           | 197.04       |     | -2.656E-01          | 5.223E-01 | 8.204E-01      | 7.343E-02 | -0.324  |
|         |           | 215.65       |     | 1.103E-01           | 6.674E-01 | 1.104E+00      | 1.005E-01 | 0.100   |
|         |           | 298.57       |     | 3.234E-01           | 1.397E-01 | 1.913E-01      | 1.793E-02 | 1.691   |
|         |           | 879.36       |     | 1.183E-02           | 1.515E-01 | 2.515E-01      | 2.144E-02 | 0.047   |
|         |           | 962.29       |     | 1.280E+00           | 6.341E-01 | 9.963E-01      | 8.436E-02 | 1.285   |
|         |           | 966.15       |     | 1.856E+00           | 3.074E-01 | 5.306E-01      | 4.492E-02 | 3.497   |
| HO-166M | +         | 1177.93      | *   | -7.180E-02          | 3.901E-01 | 6.235E-01      | 5.025E-02 | -0.115  |
|         |           | 1271.85      |     | -2.635E-01          | 7.146E-01 | 1.167E+00      | 9.833E-02 | -0.226  |
|         |           | 80.57        |     | -2.620E-01          | 2.022E-01 | 2.704E-01      | 2.739E-02 | -0.969  |
|         |           | 184.41       |     | 1.994E-01           | 4.815E-02 | 6.193E-02      | 5.468E-03 | 3.219   |
|         |           | 280.46       |     | 2.984E-02           | 8.235E-02 | 1.185E-01      | 1.112E-02 | 0.252   |
|         |           | 410.95       |     | 3.944E-01           | 2.476E-01 | 3.839E-01      | 3.373E-02 | 1.027   |
|         |           | 711.68       |     | -1.791E-02          | 6.452E-02 | 1.022E-01      | 8.952E-03 | -0.175  |
|         |           | 752.31       |     | 5.802E-02           | 2.763E-01 | 4.663E-01      | 4.089E-02 | 0.124   |
|         |           | 810.29       |     | -4.832E-02          | 6.141E-02 | 9.837E-02      | 8.570E-03 | -0.491  |
|         |           | 67.75        |     | 9.554E-04           | 6.175E-02 | 8.941E-02      | 9.214E-03 | 0.011   |
|         |           | 100.11       |     | 4.046E-01           | 2.509E-01 | 2.313E-01      | 2.508E-02 | 1.750   |
|         |           | 152.43       |     | 7.408E-02           | 3.060E-01 | 5.159E-01      | 5.128E-02 | 0.144   |
| TA-182  | +         | 222.11       | *   | -5.790E-02          | 3.102E-01 | 5.073E-01      | 4.644E-02 | -0.114  |
|         |           | 1121.30      |     | 1.051E+00           | 2.762E-01 | 3.593E-01      | 2.950E-02 | 2.925   |
|         |           | 1189.05      |     | -1.615E-01          | 3.198E-01 | 5.015E-01      | 4.065E-02 | -0.322  |
|         |           | 1221.41      |     | -2.232E-02          | 2.027E-01 | 3.373E-01      | 2.778E-02 | -0.066  |
|         |           | 1231.02      |     | 1.108E-01           | 5.563E-01 | 8.067E-01      | 6.674E-02 | 0.137   |
|         |           | 295.96       |     | 1.633E+00           | 2.349E-01 | 2.637E-01      | 2.488E-02 | 6.191   |
|         |           | 308.46       |     | -5.991E-02          | 9.059E-02 | 1.423E-01      | 1.336E-02 | -0.421  |
|         |           | 316.51       |     | -5.030E-02          | 3.269E-02 | 4.911E-02      | 4.587E-03 | -1.024  |
|         |           | 468.07       |     | -3.356E-02          | 7.133E-02 | 9.965E-02      | 9.609E-03 | -0.337  |
|         |           | 70.83        |     | 5.204E-01           | 8.423E-01 | 1.228E+00      | 2.086E-01 | 0.424   |
|         |           | 72.87        |     | 2.314E+00           | 6.532E-01 | 8.387E-01      | 1.381E-01 | 2.759   |
|         |           | 279.20       |     | 6.285E-02           | 4.161E-02 | 6.210E-02      | 5.951E-03 | 1.012   |
| BI-207  | +         | 72.81        | *   | 4.635E-01           | 1.237E-01 | 1.797E-01      | 1.835E-02 | 2.579   |
|         |           | 74.97        |     | 1.007E+00           | 1.362E-01 | 1.467E-01      | 1.493E-02 | 6.867   |
|         |           | 569.70       |     | -3.090E-03          | 2.849E-02 | 4.631E-02      | 4.211E-03 | -0.067  |
|         |           | 1063.66      |     | 3.422E-02           | 5.286E-02 | 8.886E-02      | 7.420E-03 | 0.385   |
|         |           | 1770.23      |     | 3.607E-01           | 4.684E-01 | 7.248E-01      | 6.085E-02 | 0.498   |
|         |           | 404.85       |     | 2.664E-03           | 7.522E-01 | 1.095E+00      | 5.300E-01 | 0.002   |
|         |           | 427.09       |     | 9.640E-02           | 1.373E+00 | 2.293E+00      | 1.062E+00 | 0.042   |
|         |           | 832.01       |     | -1.414E-02          | 9.796E-01 | 1.626E+00      | 8.431E-01 | -0.009  |
|         |           | 727.33       |     | 2.678E+00           | 8.234E-01 | 1.084E+00      | 1.362E-01 | 2.471   |
|         |           | 785.37       |     | -1.130E+00          | 3.375E+00 | 5.127E+00      | 4.485E-01 | -0.220  |
|         |           | 1620.50      |     | 3.298E+00           | 2.310E+00 | 4.182E+00      | 3.606E-01 | 0.789   |
|         |           | 271.23       |     | 8.385E-01           | 3.419E-01 | 3.973E-01      | 4.328E-02 | 2.111   |
| RN-219  | +         | 401.81       | *   | 3.647E-01           | 3.836E-01 | 6.399E-01      | 9.559E-02 | 0.570   |

---- Non-Identified Nuclides ----

| Nuclide  | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|----------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| RA-223   |           | 81.07        |     | -2.661E-01          | 1.616E-01 | 2.127E-01      | 2.153E-02 | -1.251  |
|          |           | 83.79        |     | 2.748E-01           | 1.177E-01 | 1.390E-01      | 1.406E-02 | 1.977   |
|          |           | 94.87        |     | 9.702E-01           | 4.968E-01 | 5.881E-01      | 6.182E-02 | 1.650   |
|          |           | 144.24       |     | 4.588E-01           | 5.903E-01 | 9.693E-01      | 1.114E-01 | 0.473   |
|          |           | 154.21       |     | 1.611E-01           | 3.316E-01 | 5.611E-01      | 5.896E-02 | 0.287   |
| + 269.46 |           | 269.46       |     | 6.515E-01           | 2.634E-01 | 3.094E-01      | 2.947E-02 | 2.105   |
|          |           | 323.87       | *   | -1.308E-01          | 7.000E-01 | 9.421E-01      | 1.665E-01 | -0.139  |
|          |           | 338.28       |     | 8.211E+00           | 1.789E+00 | 2.069E+00      | 2.586E-01 | 3.968   |
|          |           | 79.69        |     | -7.742E-01          | 9.231E-01 | 1.248E+00      | 2.251E-01 | -0.620  |
|          |           | 235.96       |     | 7.586E-01           | 1.774E-01 | 2.597E-01      | 2.821E-02 | 2.921   |
| AC-227   |           | 256.23       | *   | 2.442E-01           | 2.195E-01 | 3.661E-01      | 4.601E-02 | 0.667   |
|          |           | 299.98       |     | 2.422E+00           | 1.071E+00 | 1.425E+00      | 1.884E-01 | 1.700   |
|          |           | 304.50       |     | 3.867E-01           | 1.626E+00 | 2.311E+00      | 3.912E-01 | 0.167   |
|          |           | 334.37       |     | 3.713E-01           | 2.121E+00 | 2.508E+00      | 3.996E-01 | 0.148   |
|          |           | 79.80        |     | -1.085E+00          | 1.228E+00 | 1.644E+00      | 3.686E-01 | -0.660  |
| TH-227   |           | 235.96       |     | 7.586E-01           | 1.755E-01 | 2.597E-01      | 2.677E-02 | 2.921   |
|          |           | 256.23       | *   | 2.442E-01           | 2.200E-01 | 3.661E-01      | 5.150E-02 | 0.667   |
|          |           | 299.98       |     | 2.422E+00           | 1.071E+00 | 1.425E+00      | 1.884E-01 | 1.700   |
|          |           | 304.50       |     | 3.867E-01           | 1.626E+00 | 2.311E+00      | 3.912E-01 | 0.167   |
|          |           | 334.37       |     | 3.713E-01           | 2.121E+00 | 2.508E+00      | 3.996E-01 | 0.148   |
| TH-229   |           | 85.43        |     | 8.546E-01           | 2.124E-01 | 2.516E-01      | 2.544E-02 | 3.396   |
|          |           | 88.47        |     | 7.421E-01           | 1.253E-01 | 1.712E-01      | 1.735E-02 | 4.334   |
|          |           | 193.51       | *   | -3.611E-01          | 4.631E-01 | 7.511E-01      | 6.698E-02 | -0.481  |
|          |           | 210.85       |     | 2.072E+00           | 9.248E-01 | 1.379E+00      | 1.251E-01 | 1.502   |
|          |           | 283.69       | *   | -9.581E-01          | 1.349E+00 | 2.043E+00      | 3.075E-01 | -0.469  |
| PA-231   |           | 301.36       |     | 1.556E+00           | 6.854E-01 | 9.152E-01      | 1.162E-01 | 1.700   |
|          |           | 81.07        |     | -2.661E-01          | 1.616E-01 | 2.127E-01      | 2.153E-02 | -1.251  |
|          |           | 83.79        |     | 2.748E-01           | 1.177E-01 | 1.390E-01      | 1.406E-02 | 1.977   |
|          |           | 94.87        |     | 9.702E-01           | 4.968E-01 | 5.881E-01      | 6.182E-02 | 1.650   |
|          |           | 144.24       |     | 4.588E-01           | 5.903E-01 | 9.693E-01      | 1.114E-01 | 0.473   |
| + 154.21 |           | 154.21       |     | 1.611E-01           | 3.316E-01 | 5.611E-01      | 5.896E-02 | 0.287   |
|          |           | 269.46       |     | 6.515E-01           | 2.634E-01 | 3.094E-01      | 2.947E-02 | 2.105   |
|          |           | 323.87       | *   | -1.308E-01          | 7.000E-01 | 9.421E-01      | 1.665E-01 | -0.139  |
|          |           | 338.28       |     | 8.211E+00           | 1.789E+00 | 2.069E+00      | 2.586E-01 | 3.968   |
|          |           | 300.13       |     | 1.096E+00           | 4.917E-01 | 6.439E-01      | 9.836E-02 | 1.702   |
| PA-233   |           | 311.90       | *   | 4.874E-02           | 5.808E-02 | 9.580E-02      | 9.166E-03 | 0.509   |
|          |           | 340.48       |     | 2.852E+00           | 9.798E-01 | 1.126E+00      | 2.735E-01 | 2.532   |
|          |           | 94.67        |     | 5.657E-01           | 1.951E-01 | 2.254E-01      | 3.104E-02 | 2.510   |
|          |           | 98.44        |     | 1.995E-01           | 1.656E-01 | 1.148E-01      | 6.447E-02 | 1.738   |
|          |           | 111.00       |     | -6.295E-02          | 1.524E-01 | 2.388E-01      | 3.430E-02 | -0.264  |
| PA-234   |           | 131.20       |     | 5.373E-02           | 9.675E-02 | 1.464E-01      | 1.720E-02 | 0.367   |
|          |           | 569.50       |     | -2.702E-03          | 2.534E-01 | 4.137E-01      | 3.761E-02 | -0.007  |
|          |           | 733.00       |     | 2.756E-01           | 4.069E-01 | 6.075E-01      | 1.352E-01 | 0.454   |
|          |           | 880.51       |     | 5.700E-02           | 2.854E-01 | 4.763E-01      | 4.059E-02 | 0.120   |
|          |           | 883.24       |     | 2.219E-01           | 3.235E-01 | 4.922E-01      | 3.308E-01 | 0.451   |
| + 926.50 |           | 926.50       |     | -1.453E-01          | 1.746E-01 | 2.684E-01      | 6.771E-02 | -0.541  |
|          |           | 946.00       | *   | 3.402E-01           | 3.188E-01 | 5.401E-01      | 1.010E-01 | 0.630   |
|          |           | 949.00       |     | 3.376E-01           | 4.745E-01 | 8.043E-01      | 6.813E-02 | 0.420   |
|          |           | 766.42       |     | 2.259E+01           | 1.763E+01 | 2.107E+01      | 1.070E+01 | 1.072   |
|          |           | 766.42       |     | 2.259E+01           | 1.763E+01 | 2.107E+01      | 1.070E+01 | 1.072   |
| PA-234M  |           | 766.42       |     | 2.259E+01           | 1.763E+01 | 2.107E+01      | 1.070E+01 | 1.072   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| NP-239  | +         | 1001.03      | *   | 4.758E+00           | 5.424E+00 | 8.598E+00      | 8.437E-01 | 0.553   |
|         |           | 99.53        |     | 3.620E-01           | 2.245E-01 | 2.097E-01      | 2.266E-02 | 1.726   |
|         |           | 103.37       |     | 3.233E-02           | 1.089E-01 | 1.224E-01      | 1.354E-02 | 0.264   |
|         | +         | 106.12       |     | 1.323E-01           | 8.526E-02 | 1.107E-01      | 1.245E-02 | 1.196   |
|         |           | 117.23       | *   | -2.555E-01          | 3.399E-01 | 5.247E-01      | 6.328E-02 | -0.487  |
| AM-241  | +         | 228.18       |     | 8.817E-02           | 1.913E-01 | 3.174E-01      | 2.919E-02 | 0.278   |
|         |           | 277.60       |     | 3.642E-01           | 2.177E-01 | 2.707E-01      | 2.539E-02 | 1.345   |
|         |           | 59.54        | *   | -4.239E-02          | 5.984E-02 | 8.529E-02      | 9.457E-03 | -0.497  |
| CM-247  | +         | 278.00       |     | 1.547E+00           | 9.244E-01 | 1.135E+00      | 1.065E-01 | 1.362   |
|         |           | 287.50       |     | 2.817E-01           | 1.102E+00 | 1.797E+00      | 1.686E-01 | 0.157   |
|         |           | 402.40       | *   | 3.384E-02           | 3.603E-02 | 5.881E-02      | 5.137E-03 | 0.575   |
| CF-249  |           | 252.80       |     | -2.673E-01          | 8.178E-01 | 1.320E+00      | 1.230E-01 | -0.203  |
|         |           | 333.37       |     | 4.692E-02           | 2.596E-01 | 2.631E-01      | 2.431E-02 | 0.178   |
|         |           | 388.16       | *   | 2.512E-02           | 3.753E-02 | 6.415E-02      | 5.589E-03 | 0.392   |
| CF-251  |           | 177.52       | *   | 3.122E-02           | 1.107E-01 | 1.854E-01      | 1.624E-02 | 0.168   |
|         |           | 227.38       |     | -2.383E-01          | 3.161E-01 | 5.073E-01      | 4.662E-02 | -0.470  |
|         |           | 285.41       |     | 3.482E-01           | 1.927E+00 | 3.137E+00      | 2.943E-01 | 0.111   |

# VAX/VMS Nuclide Identification Report Generated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                    *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964004      *
* Acquisition date   : 10-MAR-2010 23:09:39 Detector SN#      :              *
* Detector ID        : GAM13                      Sensitivity   : 5.000        *
* Geometry           : CAN                          Energy tolerance: 1.500      *
* Elapsed live time  : 0 04:00:00.00             Abundance limit : 75.000      *
* Elapsed real time  : 0 04:00:04.28             Half life ratio : 8.000      *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date        : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID          : G247964004              Analyst initials: MXR1         *
* Batch Number       : 958216                  Sample Quantity : 1.4262E+02 GRAM   *
* Recovery           : 1.00000                 Carrier Weight  : 0.00000      *
*****
*
*                                     QC DATA                                *
*
* Standard Weight    : 0.00000                                                         *
* CALIB. DATE/TIME   : 10-FEB-2010 14:02:26 MS Isotope      :                *
* MSD DPM             : 0.000                      MSD Isotope :                *
* LCS DPM             : 0.000                      LCS Isotope  :                *
* LCSD DPM            : 0.000                      LCSD Isotope :                *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act error | MDA<br>(pCi/GRAM ) |           |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.510E+01               | 3.404E+00 | 5.842E-01          | 0.000E+00 |
| CD-109  | 4.957E+00               | 8.205E-01 | 8.717E-01          | 0.000E+00 |
| SN-126  | 4.814E-01               | 7.967E-02 | 8.454E-02          | 0.000E+00 |
| EU-155  | 1.662E-01               | 1.050E-01 | 1.408E-01          | 0.000E+00 |
| TL-208  | 7.746E-01               | 1.050E-01 | 5.732E-02          | 0.000E+00 |
| PB-210  | 1.624E+00               | 7.307E-01 | 7.051E-01          | 0.000E+00 |
| BI-211  | 5.597E+00               | 6.525E-01 | 3.239E-01          | 0.000E+00 |
| PB-212  | 2.382E+00               | 2.607E-01 | 8.349E-02          | 0.000E+00 |
| BI-214  | 1.917E+00               | 2.519E-01 | 1.176E-01          | 0.000E+00 |
| PB-214  | 2.031E+00               | 2.610E-01 | 1.178E-01          | 0.000E+00 |
| RA-224  | 5.460E+00               | 1.057E+00 | 8.949E-01          | 0.000E+00 |
| RA-226  | 1.917E+00               | 2.519E-01 | 1.176E-01          | 0.000E+00 |
| AC-228  | 2.712E+00               | 4.423E-01 | 2.375E-01          | 0.000E+00 |
| RA-228  | 2.712E+00               | 4.423E-01 | 2.375E-01          | 0.000E+00 |
| TH-228  | 2.382E+00               | 2.607E-01 | 8.349E-02          | 0.000E+00 |
| TH-232  | 2.712E+00               | 4.423E-01 | 2.375E-01          | 0.000E+00 |
| TH-234  | 2.450E+00               | 1.033E+00 | 9.192E-01          | 0.000E+00 |
| U-235   | 3.020E-02               | 1.738E-01 | 3.048E-01          | 0.000E+00 |
| NP-237  | 1.436E+00               | 3.790E-01 | 2.515E-01          | 0.000E+00 |
| U-238   | 2.450E+00               | 1.033E+00 | 9.192E-01          | 0.000E+00 |
| ANH-511 | 2.450E-01               | 6.613E-02 | 4.621E-02          | 0.000E+00 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | -7.300E-02                          | 3.146E-01                | 5.418E-01          | 0.000E+00 NOT IDENT. |
| NA-22   | 1.431E-02                           | 4.225E-02                | 7.362E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 9.580E+07                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| SC-46   | 4.675E-03                           | 4.043E-02                | 6.959E-02          | 0.000E+00 FAIL ABUN  |
| V-48    | -4.156E-02                          | 8.607E-02                | 1.422E-01          | 0.000E+00 NOT IDENT. |
| CR-51   | 2.931E-01                           | 3.661E-01                | 6.380E-01          | 0.000E+00 NOT IDENT. |



|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| MN-54   | 1.653E-02  | 3.646E-02 | 6.401E-02 | 0.000E+00 | NOT IDENT. |
| CO-56   | 8.831E-03  | 3.905E-02 | 6.788E-02 | 0.000E+00 | FAIL ABUN  |
| CO-57   | -1.030E-02 | 2.093E-02 | 3.613E-02 | 0.000E+00 | NOT IDENT. |
| CO-58   | -3.336E-02 | 4.148E-02 | 6.898E-02 | 0.000E+00 | NOT IDENT. |
| FE-59   | -5.593E-02 | 1.010E-01 | 1.641E-01 | 0.000E+00 | NOT IDENT. |
| CO-60   | 2.249E-02  | 3.872E-02 | 6.817E-02 | 0.000E+00 | NOT IDENT. |
| ZN-65   | 1.166E-01  | 1.046E-01 | 1.608E-01 | 0.000E+00 | NOT IDENT. |
| SE-75   | 9.829E-03  | 4.518E-02 | 6.899E-02 | 0.000E+00 | NOT IDENT. |
| SR-85   | 0.000E+00  | 4.402E-02 | 7.246E-02 | 0.000E+00 | NOT IDENT. |
| Y-88    | 8.441E-03  | 3.222E-02 | 5.624E-02 | 0.000E+00 | NOT IDENT. |
| Y-91    | -1.705E+01 | 2.152E+01 | 3.565E+01 | 0.000E+00 | NOT IDENT. |
| NB-94   | 6.927E-03  | 3.494E-02 | 5.898E-02 | 0.000E+00 | NOT IDENT. |
| NB-95   | 8.104E-02  | 5.104E-02 | 8.243E-02 | 0.000E+00 | NOT IDENT. |
| NB-95M  | 0.000E+00  | 1.334E-01 | 2.145E-01 | 0.000E+00 | NOT IDENT. |
| ZR-95   | 3.652E-02  | 7.656E-02 | 1.356E-01 | 0.000E+00 | NOT IDENT. |
| MO-99   | -1.050E+01 | 3.580E+01 | 6.159E+01 | 0.000E+00 | NOT IDENT. |
| TC-99M  | 0.000E+00  | 6.332E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | -4.034E-03 | 4.002E-02 | 6.901E-02 | 0.000E+00 | FAIL ABUN  |
| RH-106  | -1.933E-01 | 3.038E-01 | 4.983E-01 | 0.000E+00 | NOT IDENT. |
| RU-106  | -1.933E-01 | 3.032E-01 | 4.983E-01 | 0.000E+00 | NOT IDENT. |
| AG-108M | -3.382E-02 | 2.712E-02 | 4.514E-02 | 0.000E+00 | NOT IDENT. |
| AG-110M | -1.058E-02 | 3.273E-02 | 5.430E-02 | 0.000E+00 | NOT IDENT. |
| SN-113  | -1.065E-02 | 4.096E-02 | 7.181E-02 | 0.000E+00 | NOT IDENT. |
| CD-115  | 0.000E+00  | 4.137E+01 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| SN-117M | 2.109E-02  | 5.584E-02 | 1.013E-01 | 0.000E+00 | NOT IDENT. |
| TE-123M | -1.151E-02 | 2.389E-02 | 4.249E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | 9.384E-02  | 7.735E-02 | 1.426E-01 | 0.000E+00 | NOT IDENT. |
| SB-125  | 5.663E-02  | 8.121E-02 | 1.457E-01 | 0.000E+00 | FAIL ABUN  |
| TE-125M | 3.031E+00  | 9.158E+00 | 1.412E+01 | 0.000E+00 | NOT IDENT. |
| I-126   | 3.970E-01  | 2.818E-01 | 4.988E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | 9.531E-02  | 2.060E-01 | 3.189E-01 | 0.000E+00 | NOT IDENT. |
| SB-127  | -2.526E-01 | 2.893E+00 | 4.835E+00 | 0.000E+00 | NOT IDENT. |
| I-131   | 3.262E-02  | 1.431E-01 | 2.564E-01 | 0.000E+00 | NOT IDENT. |
| TE-132  | 7.764E-01  | 1.641E+00 | 2.900E+00 | 0.000E+00 | NOT IDENT. |
| BA-133  | -3.648E-03 | 4.416E-02 | 6.631E-02 | 0.000E+00 | FAIL ABUN  |
| I-133   | 0.000E+00  | 1.842E+05 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | 0.000E+00  | 9.356E-02 | 9.233E-02 | 0.000E+00 | FAIL ABUN  |
| CS-135  | 1.974E-01  | 1.643E-01 | 2.576E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 4.165E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -4.430E-02 | 1.397E-01 | 2.314E-01 | 0.000E+00 | NOT IDENT. |
| BA-137M | -3.839E-02 | 3.700E-02 | 5.458E-02 | 0.000E+00 | NOT IDENT. |
| CS-137  | -4.055E-02 | 3.908E-02 | 5.766E-02 | 0.000E+00 | NOT IDENT. |
| CE-139  | -2.793E-02 | 2.524E-02 | 4.394E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | 3.644E-02  | 3.253E-01 | 5.611E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | 1.086E-02  | 1.123E-01 | 1.891E-01 | 0.000E+00 | FAIL ABUN  |
| CE-141  | 6.644E-02  | 5.738E-02 | 1.056E-01 | 0.000E+00 | NOT IDENT. |
| CE-143  | 0.000E+00  | 2.836E+03 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CE-144  | 7.452E-02  | 1.809E-01 | 2.938E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | 1.479E-02  | 3.510E-02 | 5.985E-02 | 0.000E+00 | NOT IDENT. |
| PR-144  | 1.111E+00  | 2.633E+00 | 4.490E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | 4.438E-02  | 3.814E-02 | 6.881E-02 | 0.000E+00 | NOT IDENT. |
| ND-147  | 7.399E-02  | 6.905E-01 | 1.193E+00 | 0.000E+00 | FAIL ABUN  |
| PM-149  | 0.000E+00  | 3.154E+02 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| EU-152  | -1.448E-02 | 1.034E-01 | 1.513E-01 | 0.000E+00 | FAIL ABUN  |
| GD-153  | 9.202E-02  | 8.714E-02 | 1.085E-01 | 0.000E+00 | NOT IDENT. |
| EU-154  | 3.370E-02  | 1.191E-01 | 2.069E-01 | 0.000E+00 | NOT IDENT. |
| TB-160  | 1.183E-02  | 1.485E-01 | 2.555E-01 | 0.000E+00 | FAIL ABUN  |
| HO-166M | -1.791E-02 | 6.323E-02 | 1.044E-01 | 0.000E+00 | FAIL ABUN  |
| TA-182  | -2.232E-02 | 1.986E-01 | 3.402E-01 | 0.000E+00 | FAIL ABUN  |
| IR-192  | -5.030E-02 | 3.204E-02 | 5.101E-02 | 0.000E+00 | FAIL ABUN  |
| HG-203  | 6.285E-02  | 4.078E-02 | 6.466E-02 | 0.000E+00 | NOT IDENT. |
| BI-207  | 3.422E-02  | 5.180E-02 | 8.990E-02 | 0.000E+00 | FAIL ABUN  |
| PB-211  | 2.664E-03  | 7.372E-01 | 1.131E+00 | 0.000E+00 | NOT IDENT. |
| BI-212  | 0.000E+00  | 8.069E-01 | 1.106E+00 | 0.000E+00 | FAIL ABUN  |
| RN-219  | 3.647E-01  | 3.759E-01 | 6.612E-01 | 0.000E+00 | FAIL ABUN  |
| RA-223  | -1.308E-01 | 6.860E-01 | 9.780E-01 | 0.000E+00 | FAIL ABUN  |
| AC-227  | 2.442E-01  | 2.151E-01 | 3.819E-01 | 0.000E+00 | FAIL ABUN  |
| TH-227  | 2.442E-01  | 2.156E-01 | 3.819E-01 | 0.000E+00 | FAIL ABUN  |
| TH-229  | -3.611E-01 | 4.539E-01 | 7.881E-01 | 0.000E+00 | FAIL ABUN  |
| PA-231  | -9.581E-01 | 1.322E+00 | 2.127E+00 | 0.000E+00 | FAIL ABUN  |
| TH-231  | -1.308E-01 | 6.860E-01 | 9.780E-01 | 0.000E+00 | FAIL ABUN  |
| PA-233  | 4.874E-02  | 5.691E-02 | 9.953E-02 | 0.000E+00 | FAIL ABUN  |
| PA-234  | 3.402E-01  | 3.124E-01 | 5.478E-01 | 0.000E+00 | FAIL ABUN  |
| PA-234M | 4.758E+00  | 5.316E+00 | 8.711E+00 | 0.000E+00 | NOT IDENT. |
| NP-239  | -2.555E-01 | 3.331E-01 | 5.562E-01 | 0.000E+00 | FAIL ABUN  |
| AM-241  | -4.239E-02 | 5.865E-02 | 9.164E-02 | 0.000E+00 | NOT IDENT. |
| CM-247  | 3.384E-02  | 3.531E-02 | 6.077E-02 | 0.000E+00 | FAIL ABUN  |
| CF-249  | 2.512E-02  | 3.678E-02 | 6.634E-02 | 0.000E+00 | NOT IDENT. |

CF-251

3.122E-02

1.085E-01

1.949E-01

0.000E+00 NOT IDENT.

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                   *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964004.CNF;1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:09:39
Sample ID        : G247964004 Sample quantity : 1.42620E+02 GRAM
Detector name    : GAM13 Detector geometry: CAN
Elapsed live time: 0 04:00:00.00 Elapsed real time: 0 04:00:04.28 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 5.00000
Batch ID        : 958216 Detector SN# :
Matrix Spike ID  : LCS ID : 1032-A
*****

```

## Nuclide Line Activity Report

## Nuclide Type:

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|-------------------------|------------------------|-------------------|
| K-40    | 1460.82 | 2851  | 10.66* | 1.003E+00 | 3.510E+01               | 3.510E+01              | 9.90              |
| CD-109  | 88.03   | 986   | 3.70*  | 7.287E+00 | 4.814E+00               | 4.957E+00              | 16.89             |
| SN-126  | 64.28   | 509   | 9.60   | 7.388E+00 | 9.443E-01               | 9.443E-01              | 41.76             |
|         | 86.94   | 986   | 8.90   | 7.287E+00 | 2.001E+00               | 2.001E+00              | 43.83             |
|         | 87.57   | 986   | 37.00* | 7.287E+00 | 4.814E-01               | 4.814E-01              | 16.89             |
| EU-155  | 86.55   | 986   | 30.70  | 7.287E+00 | 5.802E-01               | 5.847E-01              | 16.93             |
|         | 105.31  | 184   | 21.10* | 6.974E+00 | 1.650E-01               | 1.662E-01              | 64.44             |
| TL-208  | 277.37  | 164   | 6.60   | 4.097E+00 | 7.967E-01               | 7.967E-01              | 60.46             |
|         | 583.19  | 1102  | 85.00* | 2.203E+00 | 7.746E-01               | 7.746E-01              | 13.84             |
|         | 860.56  | 116   | 12.50  | 1.562E+00 | 7.826E-01               | 7.826E-01              | 54.61             |
| PB-210  | 46.54   | 362   | 4.25*  | 6.908E+00 | 1.621E+00               | 1.624E+00              | 45.92             |
| BI-211  | 72.87   | ----- | 1.23   | 7.416E+00 | -----                   | Line Not Found         | -----             |
|         | 351.06  | 1867  | 12.92* | 3.399E+00 | 5.597E+00               | 5.597E+00              | 11.90             |
| PB-212  | 74.82   | 2022  | 10.28  | 7.408E+00 | 3.494E+00               | 3.494E+00              | 16.65             |
|         | 77.11   | 2958  | 17.10  | 7.394E+00 | 3.079E+00               | 3.079E+00              | 11.93             |
|         | 238.63  | 3610  | 43.60* | 4.573E+00 | 2.382E+00               | 2.382E+00              | 11.17             |
|         | 300.09  | 213   | 3.30   | 3.859E+00 | 2.202E+00               | 2.202E+00              | 43.63             |
| BI-214  | 609.32  | 1404  | 45.49* | 2.120E+00 | 1.917E+00               | 1.917E+00              | 13.41             |
|         | 1120.29 | 308   | 14.92  | 1.244E+00 | 2.184E+00               | 2.184E+00              | 27.12             |
|         | 1764.49 | 276   | 15.30  | 8.702E-01 | 2.729E+00               | 2.729E+00              | 19.33             |
| PB-214  | 74.82   | 2022  | 5.80   | 7.408E+00 | 6.193E+00               | 6.193E+00              | 15.67             |
|         | 77.11   | 2958  | 9.70   | 7.394E+00 | 5.428E+00               | 5.428E+00              | 14.50             |
|         | 242.00  | 771   | 7.25   | 4.533E+00 | 3.088E+00               | 3.088E+00              | 20.58             |
|         | 295.22  | 1159  | 18.42  | 3.908E+00 | 2.119E+00               | 2.119E+00              | 15.76             |
|         | 351.93  | 1867  | 35.60* | 3.399E+00 | 2.031E+00               | 2.031E+00              | 13.11             |
| RA-224  | 240.99  | 771   | 4.10*  | 4.533E+00 | 5.460E+00               | 5.460E+00              | 19.75             |
| RA-226  | 609.32  | 1404  | 45.49* | 2.120E+00 | 1.917E+00               | 1.917E+00              | 13.41             |
|         | 1120.29 | 308   | 14.92  | 1.244E+00 | 2.184E+00               | 2.184E+00              | 27.12             |
|         | 1764.49 | 276   | 15.30  | 8.702E-01 | 2.729E+00               | 2.729E+00              | 19.33             |
| AC-228  | 338.32  | 622   | 11.27  | 3.509E+00 | 2.069E+00               | 2.069E+00              | 45.49             |
|         | 911.20  | 790   | 25.80* | 1.485E+00 | 2.712E+00               | 2.712E+00              | 16.64             |
|         | 968.97  | 415   | 15.80  | 1.408E+00 | 2.457E+00               | 2.457E+00              | 29.16             |

Nuclide Type:

| Nuclide | Energy | Area  | %Abn    | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|--------|-------|---------|-----------|-------------------------|------------------------|-------------------|
| RA-228  | 338.32 | 622   | 11.27   | 3.509E+00 | 2.069E+00               | 2.069E+00              | 45.49             |
|         | 911.20 | 790   | 25.80*  | 1.485E+00 | 2.712E+00               | 2.712E+00              | 16.64             |
|         | 968.97 | 415   | 15.80   | 1.408E+00 | 2.457E+00               | 2.457E+00              | 29.16             |
| TH-228  | 74.82  | 2022  | 10.28   | 7.408E+00 | 3.494E+00               | 3.494E+00              | 13.57             |
|         | 77.11  | 2958  | 17.10   | 7.394E+00 | 3.079E+00               | 3.079E+00              | 11.93             |
|         | 238.63 | 3610  | 43.60*  | 4.573E+00 | 2.382E+00               | 2.382E+00              | 11.17             |
| TH-232  | 300.09 | 213   | 3.30    | 3.859E+00 | 2.202E+00               | 2.202E+00              | 74.43             |
|         | 338.32 | 622   | 11.27   | 3.509E+00 | 2.069E+00               | 2.069E+00              | 20.08             |
|         | 911.20 | 790   | 25.80*  | 1.485E+00 | 2.712E+00               | 2.712E+00              | 16.64             |
| TH-234  | 968.97 | 415   | 15.80   | 1.408E+00 | 2.457E+00               | 2.457E+00              | 29.16             |
|         | 63.29  | 509   | 3.70*   | 7.388E+00 | 2.450E+00               | 2.450E+00              | 43.02             |
|         | 92.59  | 1024  | 4.23    | 7.205E+00 | 4.422E+00               | 4.422E+00              | 28.02             |
| U-235   | 89.96  | 672   | 3.47    | 7.248E+00 | 3.517E+00               | 3.517E+00              | 31.61             |
|         | 93.35  | 1024  | 5.60    | 7.205E+00 | 3.340E+00               | 3.340E+00              | 28.83             |
|         | 143.76 | ----- | 10.96*  | 6.188E+00 | -----                   | Line Not Found         | -----             |
| NP-237  | 163.33 | ----- | 5.08    | 5.799E+00 | -----                   | Line Not Found         | -----             |
|         | 185.72 | 588   | 57.20   | 5.386E+00 | 2.510E-01               | 2.510E-01              | 24.15             |
|         | 205.31 | ----- | 5.01    | 5.061E+00 | -----                   | Line Not Found         | -----             |
| U-238   | 86.48  | 986   | 12.40*  | 7.287E+00 | 1.436E+00               | 1.436E+00              | 26.92             |
|         | 95.86  | ----- | 2.68    | 7.153E+00 | -----                   | Line Not Found         | -----             |
|         | 63.29  | 509   | 3.70*   | 7.388E+00 | 2.450E+00               | 2.450E+00              | 43.02             |
| ANH-511 | 92.59  | 1024  | 4.23    | 7.205E+00 | 4.422E+00               | 4.422E+00              | 19.29             |
|         | 511.00 | 461   | 100.00* | 2.476E+00 | 2.450E-01               | 2.450E-01              | 27.54             |

Flag: "\*" = Keyline

Total number of lines in spectrum 39  
Number of unidentified lines 6  
Number of lines tentatively identified by NID 33 84.62%

Nuclide Type :

| Nuclide | Hlife     | Decay | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|-------|-------------------------|------------------------|-----------------------------|-------------------|-------|
| K-40    | 1.25E+09Y | 1.00  | 3.510E+01               | 3.510E+01              | 0.347E+01                   | 9.90              |       |
| CD-109  | 461.40D   | 1.03  | 4.814E+00               | 4.957E+00              | 0.837E+00                   | 16.89             |       |
| SN-126  | 2.30E+05Y | 1.00  | 4.814E-01               | 4.814E-01              | 0.813E-01                   | 16.89             |       |
| EU-155  | 4.75Y     | 1.01  | 1.650E-01               | 1.662E-01              | 1.071E-01                   | 64.44             |       |
| TL-208  | 1.41E+10Y | 1.00  | 7.746E-01               | 7.746E-01              | 1.072E-01                   | 13.84             |       |
| PB-210  | 22.20Y    | 1.00  | 1.621E+00               | 1.624E+00              | 0.746E+00                   | 45.92             |       |
| BI-211  | 7.04E+08Y | 1.00  | 5.597E+00               | 5.597E+00              | 0.666E+00                   | 11.90             |       |
| PB-212  | 1.41E+10Y | 1.00  | 2.382E+00               | 2.382E+00              | 0.266E+00                   | 11.17             |       |
| BI-214  | 1600.00Y  | 1.00  | 1.917E+00               | 1.917E+00              | 0.257E+00                   | 13.41             |       |
| PB-214  | 1600.00Y  | 1.00  | 2.031E+00               | 2.031E+00              | 0.266E+00                   | 13.11             |       |
| RA-224  | 1.41E+10Y | 1.00  | 5.460E+00               | 5.460E+00              | 1.078E+00                   | 19.75             |       |
| RA-226  | 1600.00Y  | 1.00  | 1.917E+00               | 1.917E+00              | 0.257E+00                   | 13.41             |       |
| AC-228  | 1.41E+10Y | 1.00  | 2.712E+00               | 2.712E+00              | 0.451E+00                   | 16.64             |       |
| RA-228  | 1.41E+10Y | 1.00  | 2.712E+00               | 2.712E+00              | 0.451E+00                   | 16.64             |       |
| TH-228  | 1.41E+10Y | 1.00  | 2.382E+00               | 2.382E+00              | 0.266E+00                   | 11.17             |       |
| TH-232  | 1.41E+10Y | 1.00  | 2.712E+00               | 2.712E+00              | 0.451E+00                   | 16.64             |       |
| TH-234  | 4.47E+09Y | 1.00  | 2.450E+00               | 2.450E+00              | 1.054E+00                   | 43.02             |       |
| U-235   | 7.04E+08Y | 1.00  | 2.510E-01               | 2.510E-01              | 0.606E-01                   | 24.15             | K     |
| NP-237  | 2.14E+06Y | 1.00  | 1.436E+00               | 1.436E+00              | 0.387E+00                   | 26.92             |       |
| U-238   | 4.47E+09Y | 1.00  | 2.450E+00               | 2.450E+00              | 1.054E+00                   | 43.02             |       |
| ANH-511 | 1.00E+09Y | 1.00  | 2.450E-01               | 2.450E-01              | 0.675E-01                   | 27.54             |       |

Total Activity : 7.961E+01 7.975E+01

Grand Total Activity : 7.961E+01 7.975E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 99.24   | 273  | 1594  | 2.30 | 198.01  | 193  | 12 | 1.90E-02 | 61.1 | 7.09E+00 | T     |
| 0  | 128.97  | 361  | 1395  | 1.54 | 257.47  | 252  | 11 | 2.51E-02 | 41.5 | 6.50E+00 |       |
| 0  | 209.27  | 263  | 881   | 1.29 | 418.06  | 414  | 9  | 1.83E-02 | 43.4 | 5.00E+00 |       |
| 0  | 270.17  | 288  | 722   | 1.52 | 539.87  | 534  | 11 | 2.00E-02 | 39.3 | 4.18E+00 | T     |
| 0  | 327.91  | 183  | 526   | 1.44 | 655.34  | 652  | 10 | 1.27E-02 | 48.8 | 3.60E+00 | T     |
| 0  | 408.91  | 93   | 349   | 1.06 | 817.34  | 813  | 9  | 6.43E-03 | 75.6 | 3.00E+00 |       |
| 0  | 462.94  | 247  | 379   | 1.49 | 925.41  | 920  | 12 | 1.72E-02 | 34.0 | 2.70E+00 | T     |
| 0  | 727.07  | 246  | 233   | 1.59 | 1453.69 | 1448 | 12 | 1.71E-02 | 28.1 | 1.81E+00 | T     |
| 0  | 769.67  | 224  | 342   | 1.87 | 1538.89 | 1529 | 19 | 1.55E-02 | 42.1 | 1.72E+00 |       |
| 0  | 794.80  | 166  | 328   | 0.91 | 1589.16 | 1580 | 19 | 1.15E-02 | 54.7 | 1.67E+00 | T     |
| 1  | 964.50  | 189  | 184   | 2.22 | 1928.60 | 1922 | 24 | 1.31E-02 | 32.8 | 1.41E+00 | T     |
| 0  | 1237.93 | 214  | 189   | 1.74 | 2475.55 | 2468 | 15 | 1.48E-02 | 31.3 | 1.14E+00 | T     |
| 0  | 1377.88 | 63   | 83    | 1.34 | 2755.52 | 2750 | 11 | 4.36E-03 | 62.2 | 1.05E+00 |       |
| 0  | 1401.51 | 44   | 97    | 1.50 | 2802.78 | 2794 | 16 | 3.09E-03 | **** | 1.04E+00 |       |

Flags: "T" = Tentatively associated

VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 03:10:28.01

```

*****
*                                     GEL Laboratories LLC
*                                     2040 Savage Road
*                                     Charleston, SC 29414
*****
*
*                               DETECTOR DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964004.CNF;1
* Acquisition date   : 10-MAR-2010 23:09:39  Detector SN#      :
* Detector ID        : GAM13                  Sensitivity       : 5.00000
* Geometry           : CAN                    Energy tolerance  : 1.50000
* Elapsed live time  : 0 04:00:00.00          Abundance limit   : 75.00000
* Elapsed real time  : 0 04:00:04.28          Half life ratio   : 8.00000
*****
*
*                               SAMPLE DATA
*
* Sample date        : 19-FEB-2010 12:00:00  Nuclide Library : SOLID
* Sample ID          : G247964004            Analyst initials: MXR1
* Batch Number       : 958216                Sample Quantity  : 1.42620E+02 GRAM
*****
*
*                               QC DATA
*
* CALIB. DATE/TIME   : 10-FEB-2010 14:02:26.9MS Isotope      :
* MSD ID             :                      MSD Isotope      :
* LCS ID             : 1032-A               LCS Isotope      :
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| K-40    | 3.510E+01              | 3.474E+00 | 5.816E-01         | 5.203E-02 | 60.348  |
| CD-109  | 4.957E+00              | 8.372E-01 | 8.176E-01         | 8.266E-02 | 6.063   |
| SN-126  | 4.814E-01              | 8.130E-02 | 7.929E-02         | 8.014E-03 | 6.072   |
| EU-155  | 1.662E-01              | 1.071E-01 | 1.325E-01         | 1.494E-02 | 1.254   |
| TL-208  | 7.746E-01              | 1.072E-01 | 5.591E-02         | 5.389E-03 | 13.855  |
| PB-210  | 1.624E+00              | 7.456E-01 | 6.531E-01         | 7.148E-02 | 2.486   |
| BI-211  | 5.597E+00              | 6.658E-01 | 3.125E-01         | 2.978E-02 | 17.908  |
| PB-212  | 2.382E+00              | 2.660E-01 | 7.991E-02         | 8.255E-03 | 29.812  |
| BI-214  | 1.917E+00              | 2.570E-01 | 1.148E-01         | 1.194E-02 | 16.699  |
| PB-214  | 2.031E+00              | 2.664E-01 | 1.137E-01         | 1.251E-02 | 17.866  |
| RA-224  | 5.460E+00              | 1.078E+00 | 8.567E-01         | 7.940E-02 | 6.373   |
| RA-226  | 1.917E+00              | 2.570E-01 | 1.148E-01         | 1.194E-02 | 16.699  |
| AC-228  | 2.712E+00              | 4.514E-01 | 2.340E-01         | 2.685E-02 | 11.591  |
| RA-228  | 2.712E+00              | 4.514E-01 | 2.340E-01         | 2.685E-02 | 11.591  |
| TH-228  | 2.382E+00              | 2.660E-01 | 7.991E-02         | 8.255E-03 | 29.812  |
| TH-232  | 2.712E+00              | 4.514E-01 | 2.340E-01         | 2.685E-02 | 11.591  |
| TH-234  | 2.450E+00              | 1.054E+00 | 8.565E-01         | 1.651E-01 | 2.861   |
| U-235   | 2.510E-01              | 6.061E-02 | 2.887E-01         | 5.228E-02 | 0.869   |

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| NP-237  | 1.436E+00              | 3.867E-01 | 2.358E-01         | 5.490E-02 | 6.091   |
| U-238   | 2.450E+00              | 1.054E+00 | 8.565E-01         | 1.651E-01 | 2.861   |
| ANH-511 | 2.450E-01              | 6.748E-02 | 4.495E-02         | 4.102E-03 | 5.452   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| BE-7    | -7.300E-02                         |              | 3.210E-01 | 5.262E-01         | 5.106E-02 | -0.139  |
| NA-22   | 1.431E-02                          |              | 4.312E-02 | 7.306E-02         | 6.173E-03 | 0.196   |
| NA-24   | 2.478E+01                          |              | 4.888E+01 | Half-Life         | too short |         |
| SC-46   | 4.675E-03                          |              | 4.125E-02 | 6.851E-02         | 5.816E-03 | 0.068   |
| V-48    | -4.156E-02                         |              | 8.783E-02 | 1.403E-01         | 1.186E-02 | -0.296  |
| CR-51   | 2.931E-01                          |              | 3.736E-01 | 6.145E-01         | 5.977E-02 | 0.477   |
| MN-54   | 1.653E-02                          |              | 3.721E-02 | 6.293E-02         | 5.450E-03 | 0.263   |
| CO-56   | 8.831E-03                          |              | 3.984E-02 | 6.676E-02         | 5.761E-03 | 0.132   |
| CO-57   | -1.030E-02                         |              | 2.135E-02 | 3.411E-02         | 4.244E-03 | -0.302  |
| CO-58   | -3.336E-02                         |              | 4.232E-02 | 6.777E-02         | 5.918E-03 | -0.492  |
| FE-59   | -5.593E-02                         |              | 1.030E-01 | 1.624E-01         | 1.461E-02 | -0.344  |
| CO-60   | 2.249E-02                          |              | 3.951E-02 | 6.772E-02         | 5.857E-03 | 0.332   |
| ZN-65   | 1.166E-01                          |              | 1.067E-01 | 1.591E-01         | 1.310E-02 | 0.733   |
| SE-75   | 9.829E-03                          |              | 4.610E-02 | 6.618E-02         | 6.218E-03 | 0.149   |
| SR-85   | 1.206E-01                          |              | 4.492E-02 | 7.049E-02         | 6.436E-03 | 1.711   |
| Y-88    | 8.441E-03                          |              | 3.288E-02 | 5.627E-02         | 4.650E-03 | 0.150   |
| Y-91    | -1.705E+01                         |              | 2.196E+01 | 3.534E+01         | 2.887E+00 | -0.483  |
| NB-94   | 6.927E-03                          |              | 3.565E-02 | 5.777E-02         | 5.052E-03 | 0.120   |
| NB-95   | 8.104E-02                          |              | 5.208E-02 | 8.089E-02         | 7.089E-03 | 1.002   |
| NB-95M  | 3.671E-01                          |              | 1.361E-01 | 2.053E-01         | 2.141E-02 | 1.788   |
| ZR-95   | 3.652E-02                          |              | 7.812E-02 | 1.330E-01         | 1.284E-02 | 0.275   |
| MO-99   | -1.050E+01                         |              | 3.654E+01 | 6.039E+01         | 9.567E+00 | -0.174  |
| TC-99M  | -7.499E+15                         |              | 3.231E+15 | Half-Life         | too short |         |
| RU-103  | -4.034E-03                         |              | 4.084E-02 | 6.709E-02         | 9.577E-03 | -0.060  |
| RH-106  | -1.933E-01                         |              | 3.100E-01 | 4.867E-01         | 6.545E-02 | -0.397  |
| RU-106  | -1.933E-01                         |              | 3.093E-01 | 4.867E-01         | 4.337E-02 | -0.397  |
| AG-108M | -3.382E-02                         |              | 2.768E-02 | 4.376E-02         | 4.016E-03 | -0.773  |
| AG-110M | -1.058E-02                         |              | 3.340E-02 | 5.311E-02         | 4.757E-03 | -0.199  |
| SN-113  | -1.065E-02                         |              | 4.179E-02 | 6.945E-02         | 6.201E-03 | -0.153  |
| CD-115  | -8.940E-06                         |              | 2.111E-05 | Half-Life         | too short |         |
| SN-117M | 2.109E-02                          |              | 5.698E-02 | 9.617E-02         | 9.003E-03 | 0.219   |
| TE-123M | -1.151E-02                         |              | 2.438E-02 | 4.033E-02         | 3.778E-03 | -0.285  |
| SB-124  | 9.384E-02                          |              | 7.893E-02 | 1.424E-01         | 1.267E-02 | 0.659   |
| SB-125  | 5.663E-02                          |              | 8.287E-02 | 1.411E-01         | 1.275E-02 | 0.401   |
| TE-125M | 3.031E+00                          |              | 9.345E+00 | 1.330E+01         | 1.721E+00 | 0.228   |
| I-126   | 3.970E-01                          |              | 2.876E-01 | 4.880E-01         | 4.239E-02 | 0.814   |
| SB-126  | 9.531E-02                          |              | 2.102E-01 | 3.125E-01         | 2.739E-02 | 0.305   |
| SB-127  | -2.526E-01                         |              | 2.952E+00 | 4.733E+00         | 6.068E-01 | -0.053  |
| I-131   | 3.262E-02                          |              | 1.460E-01 | 2.476E-01         | 2.345E-02 | 0.132   |
| TE-132  | 7.764E-01                          |              | 1.675E+00 | 2.774E+00         | 4.736E-01 | 0.280   |



---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| BA-133  | -3.648E-03                         |              | 4.506E-02 | 6.400E-02           | 8.485E-03 | -0.057  |
| I-133   | -6.604E-02                         |              | 9.396E-02 | Half-Life too short |           |         |
| CS-134  | 1.723E-01                          | +            | 9.546E-02 | 9.068E-02           | 7.976E-03 | 1.900   |
| CS-135  | 1.974E-01                          |              | 1.676E-01 | 2.472E-01           | 2.624E-02 | 0.799   |
| I-135   | -1.204E+14                         |              | 2.125E+14 | Half-Life too short |           |         |
| CS-136  | -4.430E-02                         |              | 1.426E-01 | 2.286E-01           | 2.002E-02 | -0.194  |
| BA-137M | -3.839E-02                         |              | 3.775E-02 | 5.339E-02           | 4.633E-03 | -0.719  |
| CS-137  | -4.055E-02                         |              | 3.988E-02 | 5.640E-02           | 4.903E-03 | -0.719  |
| CE-139  | -2.793E-02                         |              | 2.575E-02 | 4.175E-02           | 3.606E-03 | -0.669  |
| BA-140  | 3.644E-02                          |              | 3.319E-01 | 5.464E-01           | 1.860E-01 | 0.067   |
| LA-140  | 1.086E-02                          |              | 1.146E-01 | 1.886E-01           | 1.631E-02 | 0.058   |
| CE-141  | 6.644E-02                          |              | 5.855E-02 | 1.001E-01           | 1.070E-02 | 0.664   |
| CE-143  | 1.061E-02                          |              | 1.447E-03 | Half-Life too short |           |         |
| CE-144  | 7.452E-02                          |              | 1.846E-01 | 2.779E-01           | 4.757E-02 | 0.268   |
| PM-144  | 1.479E-02                          |              | 3.582E-02 | 5.861E-02           | 5.124E-03 | 0.252   |
| PR-144  | 1.111E+00                          |              | 2.687E+00 | 4.397E+00           | 3.842E-01 | 0.253   |
| PM-146  | 4.438E-02                          |              | 3.892E-02 | 6.676E-02           | 7.276E-03 | 0.665   |
| ND-147  | 7.399E-02                          |              | 7.046E-01 | 1.162E+00           | 1.772E-01 | 0.064   |
| PM-149  | 1.330E-04                          |              | 1.609E-04 | Half-Life too short |           |         |
| EU-152  | -1.448E-02                         |              | 1.055E-01 | 1.460E-01           | 1.408E-02 | -0.099  |
| GD-153  | 9.202E-02                          |              | 8.892E-02 | 1.020E-01           | 1.088E-02 | 0.902   |
| EU-154  | 3.370E-02                          |              | 1.215E-01 | 2.053E-01           | 2.309E-02 | 0.164   |
| TB-160  | 1.183E-02                          |              | 1.515E-01 | 2.515E-01           | 2.144E-02 | 0.047   |
| HO-166M | -1.791E-02                         |              | 6.452E-02 | 1.022E-01           | 8.952E-03 | -0.175  |
| TA-182  | -2.232E-02                         |              | 2.027E-01 | 3.373E-01           | 2.778E-02 | -0.066  |
| IR-192  | -5.030E-02                         |              | 3.269E-02 | 4.911E-02           | 4.587E-03 | -1.024  |
| HG-203  | 6.285E-02                          |              | 4.161E-02 | 6.210E-02           | 5.951E-03 | 1.012   |
| BI-207  | 3.422E-02                          |              | 5.286E-02 | 8.886E-02           | 7.420E-03 | 0.385   |
| PB-211  | 2.664E-03                          |              | 7.522E-01 | 1.095E+00           | 5.300E-01 | 0.002   |
| BI-212  | 2.678E+00                          | +            | 8.234E-01 | 1.084E+00           | 1.362E-01 | 2.471   |
| RN-219  | 3.647E-01                          |              | 3.836E-01 | 6.399E-01           | 9.559E-02 | 0.570   |
| RA-223  | -1.308E-01                         |              | 7.000E-01 | 9.421E-01           | 1.665E-01 | -0.139  |
| AC-227  | 2.442E-01                          |              | 2.195E-01 | 3.661E-01           | 4.601E-02 | 0.667   |
| TH-227  | 2.442E-01                          |              | 2.200E-01 | 3.661E-01           | 5.150E-02 | 0.667   |
| TH-229  | -3.611E-01                         |              | 4.631E-01 | 7.511E-01           | 6.698E-02 | -0.481  |
| PA-231  | -9.581E-01                         |              | 1.349E+00 | 2.043E+00           | 3.075E-01 | -0.469  |
| TH-231  | -1.308E-01                         |              | 7.000E-01 | 9.421E-01           | 1.665E-01 | -0.139  |
| PA-233  | 4.874E-02                          |              | 5.808E-02 | 9.580E-02           | 9.166E-03 | 0.509   |
| PA-234  | 3.402E-01                          |              | 3.188E-01 | 5.401E-01           | 1.010E-01 | 0.630   |
| PA-234M | 4.758E+00                          |              | 5.424E+00 | 8.598E+00           | 8.437E-01 | 0.553   |
| NP-239  | -2.555E-01                         |              | 3.399E-01 | 5.247E-01           | 6.328E-02 | -0.487  |
| AM-241  | -4.239E-02                         |              | 5.984E-02 | 8.529E-02           | 9.457E-03 | -0.497  |
| CM-247  | 3.384E-02                          |              | 3.603E-02 | 5.881E-02           | 5.137E-03 | 0.575   |
| CF-249  | 2.512E-02                          |              | 3.753E-02 | 6.415E-02           | 5.589E-03 | 0.392   |
| CF-251  | 3.122E-02                          |              | 1.107E-01 | 1.854E-01           | 1.624E-02 | 0.168   |

# VAX/VMS Nuclide Identification Report Generated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                    *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : SYS$SYSROOT:[ALPHA.ARCHIVE.GAMMA]G247964004          *
* Acquisition date   : 10-MAR-2010 23:09:39 Detector SN#      :             *
* Detector ID        : GAM13 Sensitivity      : 5.000           *
* Geometry           : CAN Energy tolerance: 1.500           *
* Elapsed live time  : 0 04:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 04:00:04.28 Half life ratio : 8.000    *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date       : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID         : G247964004 Analyst initials: MXR1           *
* Batch Number      : 958216 Sample Quantity : 1.4262E+02 GRAM      *
* Recovery          : 1.00000 Carrier Weight : 0.00000            *
*****
*
*                                     QC DATA                               *
*
* CALIB. DATE/TIME  : 10-FEB-2010 14:02:26 MS Isotope           :          *
* MSD DPM           : 0.000 MSD Isotope           :                  *
* LCS DPM           : 0.000 LCS Isotope           :                  *
* LCSD DPM          : 0.000 LCSD Isotope          :                  *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act Error | DLC<br>(pCi/GRAM ) | TPU       |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.510E+01               | 3.404E+00 | 2.923E-01          | 1.737E+00 |
| CD-109  | 4.957E+00               | 8.205E-01 | 4.361E-01          | 4.186E-01 |
| SN-126  | 4.814E-01               | 7.967E-02 | 4.230E-02          | 4.065E-02 |
| EU-155  | 1.662E-01               | 1.050E-01 | 7.045E-02          | 5.356E-02 |
| TL-208  | 7.746E-01               | 1.050E-01 | 2.867E-02          | 5.359E-02 |
| PB-210  | 1.624E+00               | 7.307E-01 | 3.528E-01          | 3.728E-01 |
| BI-211  | 5.597E+00               | 6.525E-01 | 1.620E-01          | 3.329E-01 |
| PB-212  | 2.382E+00               | 2.607E-01 | 4.177E-02          | 1.330E-01 |
| BI-214  | 1.917E+00               | 2.519E-01 | 5.881E-02          | 1.285E-01 |
| PB-214  | 2.031E+00               | 2.610E-01 | 5.894E-02          | 1.332E-01 |
| RA-224  | 5.460E+00               | 1.057E+00 | 4.477E-01          | 5.391E-01 |
| RA-226  | 1.917E+00               | 2.519E-01 | 5.881E-02          | 1.285E-01 |
| AC-228  | 2.712E+00               | 4.423E-01 | 1.188E-01          | 2.257E-01 |
| RA-228  | 2.712E+00               | 4.423E-01 | 1.188E-01          | 2.257E-01 |
| TH-228  | 2.382E+00               | 2.607E-01 | 4.177E-02          | 1.330E-01 |
| TH-232  | 2.712E+00               | 4.423E-01 | 1.188E-01          | 2.257E-01 |
| TH-234  | 2.450E+00               | 1.033E+00 | 4.599E-01          | 5.270E-01 |
| U-235   | 3.020E-02               | 1.738E-01 | 1.525E-01          | 8.865E-02 |
| NP-237  | 1.436E+00               | 3.790E-01 | 1.258E-01          | 1.934E-01 |
| U-238   | 2.450E+00               | 1.033E+00 | 4.599E-01          | 5.270E-01 |
| ANH-511 | 2.450E-01               | 6.613E-02 | 2.312E-02          | 3.374E-02 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act error | DLC<br>(pCi/GRAM ) | TPU                  |
|---------|-------------------------------------|---------------|--------------------|----------------------|
| BE-7    | -7.300E-02                          | 3.146E-01     | 2.710E-01          | 1.605E-01 NOT IDENT. |
| NA-22   | 1.431E-02                           | 4.225E-02     | 3.683E-02          | 2.156E-02 NOT IDENT. |
| NA-24   | 2.478E+07                           | 9.580E+07     | 0.000E+00          | 4.888E+07 SHORT HLIF |
| SC-46   | 4.675E-03                           | 4.043E-02     | 3.482E-02          | 2.063E-02 FAIL ABUN  |
| V-48    | -4.156E-02                          | 8.607E-02     | 7.113E-02          | 4.391E-02 NOT IDENT. |
| CR-51   | 2.931E-01                           | 3.661E-01     | 3.192E-01          | 1.868E-01 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| MN-54   | 1.653E-02  | 3.646E-02 | 3.202E-02 | 1.860E-02 | NOT IDENT. |
| CO-56   | 8.831E-03  | 3.905E-02 | 3.396E-02 | 1.992E-02 | FAIL ABUN  |
| CO-57   | -1.030E-02 | 2.093E-02 | 1.808E-02 | 1.068E-02 | NOT IDENT. |
| CO-58   | -3.336E-02 | 4.148E-02 | 3.451E-02 | 2.116E-02 | NOT IDENT. |
| FE-59   | -5.593E-02 | 1.010E-01 | 8.212E-02 | 5.151E-02 | NOT IDENT. |
| CO-60   | 2.249E-02  | 3.872E-02 | 3.410E-02 | 1.976E-02 | NOT IDENT. |
| ZN-65   | 1.166E-01  | 1.046E-01 | 8.043E-02 | 5.336E-02 | NOT IDENT. |
| SE-75   | 9.829E-03  | 4.518E-02 | 3.452E-02 | 2.305E-02 | NOT IDENT. |
| SR-85   | 1.206E-01  | 4.402E-02 | 3.625E-02 | 2.246E-02 | NOT IDENT. |
| Y-88    | 8.441E-03  | 3.222E-02 | 2.814E-02 | 1.644E-02 | NOT IDENT. |
| Y-91    | -1.705E+01 | 2.152E+01 | 1.784E+01 | 1.098E+01 | NOT IDENT. |
| NB-94   | 6.927E-03  | 3.494E-02 | 2.951E-02 | 1.783E-02 | NOT IDENT. |
| NB-95   | 8.104E-02  | 5.104E-02 | 4.124E-02 | 2.604E-02 | NOT IDENT. |
| NB-95M  | 3.671E-01  | 1.334E-01 | 1.073E-01 | 6.807E-02 | NOT IDENT. |
| ZR-95   | 3.652E-02  | 7.656E-02 | 6.783E-02 | 3.906E-02 | NOT IDENT. |
| MO-99   | -1.050E+01 | 3.580E+01 | 3.081E+01 | 1.827E+01 | NOT IDENT. |
| TC-99M  | -7.499E+21 | 6.332E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | -4.034E-03 | 4.002E-02 | 3.453E-02 | 2.042E-02 | FAIL ABUN  |
| RH-106  | -1.933E-01 | 3.038E-01 | 2.493E-01 | 1.550E-01 | NOT IDENT. |
| RU-106  | -1.933E-01 | 3.032E-01 | 2.493E-01 | 1.547E-01 | NOT IDENT. |
| AG-108M | -3.382E-02 | 2.712E-02 | 2.259E-02 | 1.384E-02 | NOT IDENT. |
| AG-110M | -1.058E-02 | 3.273E-02 | 2.717E-02 | 1.670E-02 | NOT IDENT. |
| SN-113  | -1.065E-02 | 4.096E-02 | 3.593E-02 | 2.090E-02 | NOT IDENT. |
| CD-115  | -8.940E+00 | 4.137E+01 | 0.000E+00 | 2.111E+01 | SHORT HLIF |
| SN-117M | 2.109E-02  | 5.584E-02 | 5.069E-02 | 2.849E-02 | NOT IDENT. |
| TE-123M | -1.151E-02 | 2.389E-02 | 2.126E-02 | 1.219E-02 | NOT IDENT. |
| SB-124  | 9.384E-02  | 7.735E-02 | 7.135E-02 | 3.947E-02 | NOT IDENT. |
| SB-125  | 5.663E-02  | 8.121E-02 | 7.287E-02 | 4.143E-02 | FAIL ABUN  |
| TE-125M | 3.031E+00  | 9.158E+00 | 7.064E+00 | 4.672E+00 | NOT IDENT. |
| I-126   | 3.970E-01  | 2.818E-01 | 2.496E-01 | 1.438E-01 | NOT IDENT. |
| SB-126  | 9.531E-02  | 2.060E-01 | 1.596E-01 | 1.051E-01 | NOT IDENT. |
| SB-127  | -2.526E-01 | 2.893E+00 | 2.419E+00 | 1.476E+00 | NOT IDENT. |
| I-131   | 3.262E-02  | 1.431E-01 | 1.283E-01 | 7.300E-02 | NOT IDENT. |
| TE-132  | 7.764E-01  | 1.641E+00 | 1.451E+00 | 8.375E-01 | NOT IDENT. |
| BA-133  | -3.648E-03 | 4.416E-02 | 3.317E-02 | 2.253E-02 | FAIL ABUN  |
| I-133   | -6.604E+04 | 1.842E+05 | 0.000E+00 | 9.396E+04 | SHORT HLIF |
| CS-134  | 1.723E-01  | 9.356E-02 | 4.619E-02 | 4.773E-02 | FAIL ABUN  |
| CS-135  | 1.974E-01  | 1.643E-01 | 1.289E-01 | 8.380E-02 | NOT IDENT. |
| I-135   | -1.204E+20 | 4.165E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -4.430E-02 | 1.397E-01 | 1.158E-01 | 7.129E-02 | NOT IDENT. |
| BA-137M | -3.839E-02 | 3.700E-02 | 2.731E-02 | 1.888E-02 | NOT IDENT. |
| CS-137  | -4.055E-02 | 3.908E-02 | 2.885E-02 | 1.994E-02 | NOT IDENT. |
| CE-139  | -2.793E-02 | 2.524E-02 | 2.198E-02 | 1.288E-02 | NOT IDENT. |
| BA-140  | 3.644E-02  | 3.253E-01 | 2.807E-01 | 1.659E-01 | NOT IDENT. |
| LA-140  | 1.086E-02  | 1.123E-01 | 9.460E-02 | 5.728E-02 | FAIL ABUN  |
| CE-141  | 6.644E-02  | 5.738E-02 | 5.284E-02 | 2.927E-02 | NOT IDENT. |
| CE-143  | 1.061E+04  | 2.836E+03 | 0.000E+00 | 1.447E+03 | SHORT HLIF |
| CE-144  | 7.452E-02  | 1.809E-01 | 1.470E-01 | 9.230E-02 | NOT IDENT. |
| PM-144  | 1.479E-02  | 3.510E-02 | 2.994E-02 | 1.791E-02 | NOT IDENT. |
| PR-144  | 1.111E+00  | 2.633E+00 | 2.246E+00 | 1.343E+00 | NOT IDENT. |
| PM-146  | 4.438E-02  | 3.814E-02 | 3.443E-02 | 1.946E-02 | NOT IDENT. |
| ND-147  | 7.399E-02  | 6.905E-01 | 5.969E-01 | 3.523E-01 | FAIL ABUN  |
| PM-149  | 1.330E+02  | 3.154E+02 | 0.000E+00 | 1.609E+02 | SHORT HLIF |
| EU-152  | -1.448E-02 | 1.034E-01 | 7.571E-02 | 5.275E-02 | FAIL ABUN  |
| GD-153  | 9.202E-02  | 8.714E-02 | 5.430E-02 | 4.446E-02 | NOT IDENT. |
| EU-154  | 3.370E-02  | 1.191E-01 | 1.035E-01 | 6.076E-02 | NOT IDENT. |
| TB-160  | 1.183E-02  | 1.485E-01 | 1.278E-01 | 7.577E-02 | FAIL ABUN  |
| HO-166M | -1.791E-02 | 6.323E-02 | 5.221E-02 | 3.226E-02 | FAIL ABUN  |
| TA-182  | -2.232E-02 | 1.986E-01 | 1.702E-01 | 1.013E-01 | FAIL ABUN  |
| IR-192  | -5.030E-02 | 3.204E-02 | 2.552E-02 | 1.635E-02 | FAIL ABUN  |
| HG-203  | 6.285E-02  | 4.078E-02 | 3.235E-02 | 2.081E-02 | NOT IDENT. |
| BI-207  | 3.422E-02  | 5.180E-02 | 4.498E-02 | 2.643E-02 | FAIL ABUN  |
| PB-211  | 2.664E-03  | 7.372E-01 | 5.658E-01 | 3.761E-01 | NOT IDENT. |
| BI-212  | 2.678E+00  | 8.069E-01 | 5.533E-01 | 4.117E-01 | FAIL ABUN  |
| RN-219  | 3.647E-01  | 3.759E-01 | 3.308E-01 | 1.918E-01 | FAIL ABUN  |
| RA-223  | -1.308E-01 | 6.860E-01 | 4.893E-01 | 3.500E-01 | FAIL ABUN  |
| AC-227  | 2.442E-01  | 2.151E-01 | 1.910E-01 | 1.097E-01 | FAIL ABUN  |
| TH-227  | 2.442E-01  | 2.156E-01 | 1.910E-01 | 1.100E-01 | FAIL ABUN  |
| TH-229  | -3.611E-01 | 4.539E-01 | 3.943E-01 | 2.316E-01 | FAIL ABUN  |
| PA-231  | -9.581E-01 | 1.322E+00 | 1.064E+00 | 6.745E-01 | FAIL ABUN  |
| TH-231  | -1.308E-01 | 6.860E-01 | 4.893E-01 | 3.500E-01 | FAIL ABUN  |
| PA-233  | 4.874E-02  | 5.691E-02 | 4.980E-02 | 2.904E-02 | FAIL ABUN  |
| PA-234  | 3.402E-01  | 3.124E-01 | 2.741E-01 | 1.594E-01 | FAIL ABUN  |
| PA-234M | 4.758E+00  | 5.316E+00 | 4.358E+00 | 2.712E+00 | NOT IDENT. |
| NP-239  | -2.555E-01 | 3.331E-01 | 2.783E-01 | 1.699E-01 | FAIL ABUN  |
| AM-241  | -4.239E-02 | 5.865E-02 | 4.585E-02 | 2.992E-02 | NOT IDENT. |
| CM-247  | 3.384E-02  | 3.531E-02 | 3.041E-02 | 1.802E-02 | FAIL ABUN  |
| CF-249  | 2.512E-02  | 3.678E-02 | 3.319E-02 | 1.877E-02 | NOT IDENT. |

CF-251

3.122E-02

1.085E-01

9.751E-02

5.534E-02 NOT IDENT.

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 SAVAGE ROAD                               *
*                               CHARLESTON , SC 29417                          *
*                               GAMMA SPECTROSCOPY BACKGROUND REPORT            *
*****

```

| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 980.2101   |
| 49.72  | 1078.0505  |
| 57.36  | 0.0000     |
| 59.54  | 1433.1039  |
| 63.29  | 1463.7578  |
| 63.29  | 1463.7578  |
| 64.28  | 1467.4221  |
| 67.75  | 1570.6356  |
| 69.67  | 1596.9651  |
| 70.83  | 1606.1230  |
| 72.81  | 1608.7695  |
| 72.87  | 1608.9922  |
| 72.87  | 1608.9922  |
| 74.82  | 1616.1953  |
| 74.82  | 1616.1953  |
| 74.82  | 1616.1953  |
| 74.97  | 1616.7440  |
| 77.11  | 1624.5343  |
| 77.11  | 1624.5343  |
| 77.11  | 1624.5343  |
| 79.69  | 1633.7906  |
| 79.80  | 1634.1820  |
| 80.12  | 1635.3180  |
| 80.19  | 1635.5636  |
| 80.57  | 1636.9067  |
| 81.00  | 1638.4264  |
| 81.07  | 1638.6720  |
| 81.07  | 1638.6720  |
| 83.79  | 1271.3667  |
| 83.79  | 1271.3667  |
| 85.43  | 1213.2587  |
| 86.48  | 1215.8994  |
| 86.55  | 1216.0740  |
| 86.79  | 1216.6652  |
| 86.94  | 1217.0480  |
| 87.57  | 1218.6189  |
| 88.03  | 1219.7618  |
| 88.47  | 1220.8542  |
| 89.96  | 1224.5253  |
| 91.11  | 1227.3406  |
| 92.59  | 1230.9385  |
| 92.59  | 1230.9385  |
| 93.35  | 1232.7739  |
| 94.67  | 1235.9440  |
| 94.87  | 1236.4225  |
| 94.87  | 1236.4225  |
| 95.86  | 879.5686   |
| 97.43  | 882.2111   |
| 98.44  | 942.3749   |
| 99.53  | 917.2612   |
| 100.11 | 918.2549   |
| 103.18 | 932.5474   |
| 103.37 | 932.8693   |
| 105.31 | 1001.7548  |
| 106.12 | 1067.5393  |
| 109.28 | 989.2332   |
| 111.00 | 1038.7981  |
| 111.76 | 1077.0276  |
| 116.30 | 971.6298   |
| 117.23 | 992.9105   |
| 121.12 | 902.1902   |
| 121.78 | 928.6370   |
| 122.06 | 929.0604   |
| 123.07 | 930.8780   |
| 131.20 | 937.4360   |
| 133.52 | 906.4139   |
| 136.00 | 948.6372   |

|        |           |
|--------|-----------|
| 136.47 | 957.3966  |
| 140.51 | 1030.0897 |
| 140.51 | 0.0000    |
| 143.76 | 952.3006  |
| 144.24 | 897.4959  |
| 144.24 | 897.4959  |
| 145.44 | 927.2847  |
| 152.43 | 953.0470  |
| 153.25 | 940.3152  |
| 154.21 | 934.1840  |
| 154.21 | 934.1840  |
| 156.02 | 893.9836  |
| 158.56 | 842.3412  |
| 159.00 | 883.6825  |
| 162.66 | 842.3118  |
| 163.33 | 802.9103  |
| 165.86 | 897.3868  |
| 176.60 | 813.8793  |
| 177.52 | 818.6174  |
| 181.07 | 825.0820  |
| 184.41 | 837.6554  |
| 185.72 | 855.6923  |
| 193.51 | 872.3694  |
| 197.04 | 803.9371  |
| 205.31 | 800.1403  |
| 210.85 | 754.4601  |
| 215.65 | 726.4212  |
| 222.11 | 716.4479  |
| 227.38 | 768.7156  |
| 228.16 | 707.9130  |
| 228.18 | 707.9290  |
| 235.69 | 706.2962  |
| 235.96 | 706.4874  |
| 235.96 | 706.4874  |
| 238.63 | 677.8544  |
| 238.63 | 677.8544  |
| 240.99 | 679.4600  |
| 242.00 | 617.6415  |
| 244.70 | 509.5244  |
| 252.40 | 576.7033  |
| 252.80 | 582.0854  |
| 256.23 | 533.2626  |
| 256.23 | 533.2626  |
| 260.90 | 0.0000    |
| 264.66 | 566.1035  |
| 268.22 | 636.6670  |
| 269.46 | 580.7803  |
| 269.46 | 580.7803  |
| 271.23 | 575.4184  |
| 273.65 | 627.2023  |
| 276.40 | 597.1086  |
| 277.37 | 544.8408  |
| 277.60 | 544.9510  |
| 278.00 | 539.2315  |
| 279.20 | 517.8094  |
| 279.54 | 539.9714  |
| 280.46 | 506.5334  |
| 283.69 | 572.7889  |
| 284.31 | 542.8985  |
| 285.41 | 527.4692  |
| 285.90 | 0.0000    |
| 287.50 | 531.6342  |
| 293.27 | 0.0000    |
| 295.22 | 523.3997  |
| 295.96 | 467.9203  |
| 298.57 | 468.9648  |
| 299.98 | 528.9679  |
| 299.98 | 528.9679  |
| 300.09 | 529.0166  |
| 300.09 | 529.0166  |
| 300.13 | 529.0353  |
| 301.36 | 489.9069  |
| 302.85 | 473.2520  |
| 304.50 | 487.7444  |
| 304.50 | 487.7444  |
| 304.85 | 486.1588  |
| 308.46 | 512.9989  |
| 311.90 | 455.7239  |

|        |          |
|--------|----------|
| 316.51 | 515.3065 |
| 319.41 | 458.5178 |
| 320.08 | 451.0965 |
| 323.87 | 490.2526 |
| 323.87 | 490.2526 |
| 328.76 | 499.4364 |
| 333.37 | 478.0107 |
| 334.37 | 484.2892 |
| 334.37 | 484.2892 |
| 338.28 | 505.3835 |
| 338.28 | 505.3835 |
| 338.32 | 505.3974 |
| 338.32 | 505.3974 |
| 338.32 | 505.3974 |
| 340.48 | 480.6475 |
| 340.55 | 480.6738 |
| 344.28 | 489.1930 |
| 351.06 | 504.7188 |
| 351.93 | 505.0484 |
| 356.01 | 420.2791 |
| 364.49 | 393.3072 |
| 366.42 | 421.9966 |
| 383.85 | 481.4890 |
| 388.16 | 430.4073 |
| 388.63 | 423.1743 |
| 391.69 | 429.6141 |
| 400.66 | 421.1042 |
| 401.81 | 385.5618 |
| 402.40 | 386.2357 |
| 404.85 | 417.9482 |
| 410.95 | 340.0928 |
| 414.70 | 388.7519 |
| 423.72 | 353.0310 |
| 427.09 | 359.4785 |
| 427.87 | 346.4088 |
| 433.94 | 406.6679 |
| 453.88 | 313.6476 |
| 463.37 | 301.9225 |
| 468.07 | 326.7171 |
| 473.00 | 336.7671 |
| 476.78 | 359.9642 |
| 477.60 | 345.4957 |
| 487.02 | 326.8050 |
| 492.35 | 0.0000   |
| 497.08 | 325.7501 |
| 511.00 | 330.3222 |
| 514.00 | 312.2758 |
| 527.90 | 0.0000   |
| 529.87 | 0.0000   |
| 531.02 | 294.7669 |
| 537.26 | 311.9120 |
| 546.56 | 0.0000   |
| 563.25 | 283.4854 |
| 569.33 | 279.2449 |
| 569.50 | 280.2982 |
| 569.70 | 281.3517 |
| 583.19 | 292.6038 |
| 600.60 | 289.4238 |
| 602.73 | 339.3219 |
| 604.72 | 325.7130 |
| 609.32 | 326.8002 |
| 609.32 | 326.8002 |
| 610.33 | 326.9602 |
| 614.28 | 311.4927 |
| 618.01 | 281.6635 |
| 621.93 | 280.3261 |
| 621.93 | 280.3261 |
| 633.25 | 291.3751 |
| 635.95 | 262.0455 |
| 636.99 | 261.1107 |
| 645.85 | 256.8686 |
| 657.76 | 249.7127 |
| 661.66 | 285.5928 |
| 661.66 | 285.5928 |
| 664.57 | 0.0000   |
| 666.33 | 256.0708 |
| 666.50 | 256.0940 |
| 677.62 | 250.8953 |

|         |          |
|---------|----------|
| 685.70  | 262.6551 |
| 695.00  | 278.9937 |
| 696.49  | 278.0845 |
| 696.51  | 278.0845 |
| 697.00  | 297.7806 |
| 702.65  | 299.6072 |
| 706.68  | 299.0403 |
| 711.68  | 292.0025 |
| 720.70  | 256.6090 |
| 721.93  | 0.0000   |
| 722.78  | 267.8662 |
| 722.91  | 267.8840 |
| 723.31  | 293.1420 |
| 724.19  | 291.6757 |
| 727.33  | 247.8642 |
| 733.00  | 213.6402 |
| 735.93  | 247.7059 |
| 739.50  | 249.9280 |
| 747.24  | 258.1647 |
| 752.31  | 253.1185 |
| 753.82  | 221.6191 |
| 756.73  | 258.2448 |
| 763.94  | 213.1887 |
| 765.81  | 255.0588 |
| 766.42  | 267.9560 |
| 777.92  | 256.7095 |
| 778.90  | 238.1838 |
| 783.70  | 219.6036 |
| 785.37  | 259.0479 |
| 795.86  | 212.1419 |
| 801.95  | 257.1302 |
| 810.29  | 260.9612 |
| 810.76  | 258.1535 |
| 815.77  | 214.7461 |
| 818.51  | 208.2869 |
| 832.01  | 226.6516 |
| 834.85  | 229.7808 |
| 836.80  | 0.0000   |
| 846.77  | 200.8737 |
| 856.80  | 192.7642 |
| 860.56  | 202.8770 |
| 871.09  | 197.8168 |
| 873.19  | 196.0192 |
| 875.33  | 0.0000   |
| 879.36  | 217.9640 |
| 880.51  | 204.3652 |
| 883.24  | 185.9721 |
| 884.68  | 214.4687 |
| 889.28  | 204.0348 |
| 898.04  | 244.0342 |
| 911.20  | 214.5277 |
| 911.20  | 214.5277 |
| 911.20  | 214.5277 |
| 926.50  | 200.7712 |
| 937.49  | 223.4850 |
| 944.13  | 213.9957 |
| 946.00  | 187.1179 |
| 949.00  | 206.3395 |
| 962.29  | 193.1855 |
| 964.08  | 203.3685 |
| 966.15  | 203.5124 |
| 968.97  | 203.7055 |
| 968.97  | 203.7055 |
| 968.97  | 203.7055 |
| 983.53  | 204.6960 |
| 996.26  | 263.5580 |
| 1001.03 | 191.6069 |
| 1004.73 | 219.3873 |
| 1037.84 | 203.1643 |
| 1038.76 | 0.0000   |
| 1048.07 | 210.0293 |
| 1050.41 | 185.3367 |
| 1050.41 | 185.3367 |
| 1063.66 | 172.5857 |
| 1085.87 | 217.7415 |
| 1099.45 | 217.5875 |
| 1112.07 | 184.4979 |
| 1115.54 | 188.3114 |



|         |          |
|---------|----------|
| 1120.29 | 226.6497 |
| 1120.29 | 226.6497 |
| 1120.55 | 226.6671 |
| 1121.30 | 183.1893 |
| 1131.51 | 0.0000   |
| 1173.23 | 191.2037 |
| 1177.93 | 218.3472 |
| 1189.05 | 215.8040 |
| 1204.77 | 225.7361 |
| 1221.41 | 238.9196 |
| 1231.02 | 227.6227 |
| 1235.36 | 231.1689 |
| 1238.28 | 200.1786 |
| 1260.41 | 0.0000   |
| 1271.85 | 166.5223 |
| 1274.44 | 160.9581 |
| 1274.54 | 160.9581 |
| 1291.59 | 172.1495 |
| 1298.22 | 0.0000   |
| 1312.11 | 169.2587 |
| 1332.49 | 122.0834 |
| 1365.19 | 105.6584 |
| 1368.63 | 0.0000   |
| 1384.29 | 107.3815 |
| 1408.01 | 104.5831 |
| 1457.56 | 0.0000   |
| 1460.82 | 103.1947 |
| 1489.16 | 62.9319  |
| 1505.03 | 100.2616 |
| 1596.21 | 88.0216  |
| 1620.50 | 52.4764  |
| 1678.03 | 0.0000   |
| 1690.97 | 38.6492  |
| 1764.49 | 47.7230  |
| 1764.49 | 47.7230  |
| 1770.23 | 33.4457  |
| 1771.35 | 39.0289  |
| 1791.20 | 0.0000   |
| 1836.06 | 41.4165  |

TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G247964004

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 7.3026E+00 | ug/g |
| Total Uranium Counting Unc. | 3.0740E+00 | ug/g |
| Total Uranium Tpu           | 1.5683E-06 | ug/g |
| Total Uranium Mda           | 1.3699E+00 | ug/g |

```

*****
*
*               GEL Laboratories LLC               *
*               2040 SAVAGE ROAD                   *
*               CHARLESTON , SC 29417               *
*               GROSS GAMMA REPORT                 *
*
*****
*
*  BATCH ID      : 958216                      SAMPLE ID : G247964004
*  ANALYST       : MXR1                        DETECTOR  : GAM13
*  SAMPLE DATE   : 19-FEB-2010 12:00:00.00    COUNT TIME : 0 04:00:00.00
*  ANALYSIS DATE : 10-MAR-2010 23:09:39.67    SAMPLE ALQT: 142.620 GRAM
*
*****

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```

GROSS GAMMA ACTIVITY (pCi/GRAM ) : 1.344E+01
GROSS GAMMA ERROR (pCi/GRAM ) : 1.419E+00
GROSS GAMMA MDA (pCi/GRAM ) : 3.736E+00
GROSS GAMMA DLC (pCi/GRAM ) : 1.840E+00

```

## VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 03:11:07.16

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                    *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964005.CNF;1
Sample date        : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:10:07
Sample ID          : G247964005 Sample quantity : 1.23990E+02 GRAM
Detector name      : GAM15 Detector geometry: CAN
Elapsed live time: 0 04:00:00.00 Elapsed real time: 0 04:00:03.08 0.0%
Energy tolerance   : 1.50000 keV Analyst Initials : MXR1
Abundance limit    : 75.00000 Sensitivity : 5.00000
Batch ID           : 958216 Detector SN# :
Matrix Spike ID    : LCS ID : 1032-A
*****

```

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|------|----|----------|------|----------|
| 1  | 0  | 63.27*   | 150  | 967   | 0.80 | 125.46  | 121  | 9  | 1.04E-02 | 39.5 |          |
| 2  | 3  | 75.09*   | 877  | 1398  | 1.76 | 149.11  | 141  | 20 | 6.09E-02 | 9.8  | 6.09E+00 |
| 3  | 3  | 77.27*   | 1332 | 1104  | 1.45 | 153.46  | 141  | 20 | 9.25E-02 | 5.7  |          |
| 4  | 2  | 87.44    | 499  | 856   | 1.24 | 173.80  | 163  | 30 | 3.47E-02 | 10.7 | 2.61E+00 |
| 5  | 2  | 90.04    | 348  | 1025  | 1.48 | 179.00  | 163  | 30 | 2.42E-02 | 18.1 |          |
| 6  | 2  | 92.98*   | 546  | 958   | 1.54 | 184.89  | 163  | 30 | 3.79E-02 | 12.4 |          |
| 7  | 0  | 186.03*  | 557  | 1001  | 1.67 | 370.98  | 364  | 13 | 3.87E-02 | 12.9 |          |
| 8  | 0  | 209.27   | 265  | 739   | 1.25 | 417.45  | 413  | 10 | 1.84E-02 | 20.2 |          |
| 9  | 3  | 238.69*  | 3053 | 485   | 1.40 | 476.29  | 468  | 20 | 2.12E-01 | 2.3  | 2.85E+00 |
| 10 | 3  | 241.66*  | 719  | 631   | 1.79 | 482.23  | 468  | 20 | 4.99E-02 | 9.5  |          |
| 11 | 0  | 270.28   | 211  | 571   | 1.42 | 539.46  | 534  | 11 | 1.46E-02 | 23.0 |          |
| 12 | 0  | 277.51   | 108  | 474   | 1.09 | 553.93  | 550  | 9  | 7.50E-03 | 37.7 |          |
| 13 | 2  | 295.28*  | 1045 | 401   | 1.50 | 589.47  | 584  | 22 | 7.26E-02 | 4.8  | 1.96E+00 |
| 14 | 2  | 300.35*  | 216  | 534   | 1.92 | 599.61  | 584  | 22 | 1.50E-02 | 22.9 |          |
| 15 | 0  | 327.69   | 152  | 399   | 1.40 | 654.28  | 650  | 10 | 1.05E-02 | 25.8 |          |
| 16 | 0  | 338.29*  | 645  | 367   | 1.47 | 675.47  | 670  | 10 | 4.48E-02 | 7.0  |          |
| 17 | 0  | 351.93*  | 1742 | 407   | 1.57 | 702.76  | 697  | 12 | 1.21E-01 | 3.4  |          |
| 18 | 0  | 409.52*  | 120  | 289   | 1.62 | 817.94  | 812  | 12 | 8.35E-03 | 30.4 |          |
| 19 | 0  | 462.99   | 143  | 267   | 1.34 | 924.88  | 920  | 10 | 9.94E-03 | 23.0 |          |
| 20 | 0  | 510.75*  | 346  | 369   | 1.70 | 1020.41 | 1012 | 17 | 2.40E-02 | 15.5 |          |
| 21 | 0  | 583.02*  | 996  | 276   | 1.66 | 1164.95 | 1157 | 16 | 6.92E-02 | 5.0  |          |
| 22 | 0  | 609.18*  | 1201 | 246   | 1.71 | 1217.27 | 1211 | 14 | 8.34E-02 | 4.1  |          |
| 23 | 0  | 726.70*  | 206  | 206   | 1.88 | 1452.33 | 1443 | 16 | 1.43E-02 | 17.5 |          |
| 24 | 0  | 767.87   | 123  | 161   | 1.84 | 1534.69 | 1529 | 11 | 8.54E-03 | 22.0 |          |
| 25 | 0  | 786.53   | 115  | 170   | 1.58 | 1572.00 | 1565 | 16 | 7.95E-03 | 27.5 |          |
| 26 | 0  | 860.75*  | 143  | 211   | 1.78 | 1720.46 | 1710 | 18 | 9.93E-03 | 25.8 |          |
| 27 | 0  | 910.98*  | 679  | 124   | 1.92 | 1820.95 | 1815 | 14 | 4.71E-02 | 5.3  |          |
| 28 | 1  | 964.30   | 135  | 111   | 2.14 | 1927.60 | 1920 | 26 | 9.38E-03 | 18.0 | 1.10E+00 |
| 29 | 1  | 968.66*  | 399  | 90    | 2.06 | 1936.33 | 1920 | 26 | 2.77E-02 | 7.2  |          |
| 30 | 0  | 1119.50* | 226  | 194   | 1.96 | 2238.07 | 2231 | 18 | 1.57E-02 | 16.0 |          |
| 31 | 0  | 1237.36  | 79   | 168   | 1.82 | 2473.84 | 2468 | 13 | 5.51E-03 | 35.6 |          |
| 32 | 0  | 1377.65  | 66   | 82    | 1.87 | 2754.50 | 2747 | 16 | 4.57E-03 | 33.4 |          |
| 33 | 0  | 1408.36  | 69   | 38    | 1.12 | 2815.95 | 2808 | 17 | 4.80E-03 | 23.7 |          |
| 34 | 0  | 1460.27  | 2455 | 110   | 2.14 | 2919.80 | 2910 | 22 | 1.70E-01 | 2.3  |          |
| 35 | 0  | 1587.74  | 40   | 47    | 1.61 | 3174.83 | 3169 | 13 | 2.78E-03 | 38.3 |          |
| 36 | 0  | 1592.99  | 37   | 28    | 0.85 | 3185.33 | 3181 | 12 | 2.54E-03 | 34.1 |          |
| 37 | 0  | 1630.21  | 49   | 24    | 1.79 | 3259.80 | 3252 | 17 | 3.38E-03 | 27.6 |          |
| 38 | 0  | 1729.45  | 28   | 31    | 2.28 | 3458.37 | 3451 | 14 | 1.93E-03 | 46.8 |          |

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit |
|----|----|----------|------|-------|------|---------|------|----|----------|------|-----|
| 39 | 0  | 1763.95* | 211  | 25    | 2.46 | 3527.39 | 3518 | 20 | 1.47E-02 | 9.5  |     |
| 40 | 0  | 1846.73  | 44   | 8     | 2.21 | 3693.01 | 3687 | 11 | 3.03E-03 | 19.8 |     |

Flag: "\*" = Peak area was modified by background subtraction

## VMS Nuclide Identification Report V3.1 Generated 11-MAR-2010 03:11:09

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964005.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8
Sample title      : MXR1
Sample date       : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:10:07
Sample ID         : G247964005 Sample quantity : 123.99 GRAM
Sample type       : SOLID Sample geometry :
Detector name     : GAMMA15 Detector geometry: CAN
Elapsed live time : 0 04:00:00.00 Elapsed real time: 0 04:00:03.08 0.0%
Peak Width (FWHM): 3.00 Confidence level : 5.00 %
Energy tolerance : 1.50 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00 WTM error limit : 3.00

```

## Full Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| K-40    | +         | 1460.82      | *   | 3.607E+01           | 3.912E+00 | 5.029E-01      | 4.942E-02 | 71.727  |
| CD-109  | +         | 88.03        | *   | 4.723E+00           | 1.166E+00 | 1.315E+00      | 1.632E-01 | 3.592   |
| SN-126  | +         | 64.28        |     | 1.300E+00           | 1.049E+00 | 1.098E+00      | 1.859E-01 | 1.183   |
|         | +         | 86.94        |     | 1.906E+00           | 9.035E-01 | 5.406E-01      | 2.286E-01 | 3.526   |
|         | +         | 87.57        | *   | 4.586E-01           | 1.132E-01 | 1.287E-01      | 1.592E-02 | 3.565   |
| TL-208  | +         | 277.37       |     | 6.688E-01           | 5.134E-01 | 6.272E-01      | 8.869E-02 | 1.066   |
|         | +         | 583.19       | *   | 8.098E-01           | 1.101E-01 | 5.707E-02      | 5.219E-03 | 14.190  |
|         | +         | 860.56       |     | 1.099E+00           | 5.768E-01 | 4.052E-01      | 3.962E-02 | 2.712   |
| BI-211  |           | 72.87        |     | 1.713E+01           | 4.779E+00 | 7.272E+00      | 8.329E-01 | 2.356   |
|         | +         | 351.06       | *   | 6.499E+00           | 7.824E-01 | 3.314E-01      | 3.301E-02 | 19.610  |
| BI-212  | +         | 727.33       | *   | 2.547E+00           | 9.456E-01 | 7.703E-01      | 9.571E-02 | 3.307   |
|         | +         | 785.37       |     | 9.217E+00           | 5.128E+00 | 4.828E+00      | 4.275E-01 | 1.909   |
|         |           | 1620.50      |     | 1.529E+00           | 2.453E+00 | 4.069E+00      | 3.787E-01 | 0.376   |
| PB-212  | +         | 74.82        |     | 3.962E+00           | 9.812E-01 | 6.836E-01      | 1.030E-01 | 5.795   |
|         | +         | 77.11        |     | 3.367E+00           | 5.473E-01 | 3.813E-01      | 4.420E-02 | 8.829   |
|         | +         | 238.63       | *   | 2.576E+00           | 3.301E-01 | 9.377E-02      | 1.120E-02 | 27.469  |
|         | +         | 300.09       |     | 2.821E+00           | 1.336E+00 | 1.268E+00      | 1.544E-01 | 2.225   |
| BI-214  | +         | 609.32       | *   | 1.887E+00           | 2.436E-01 | 1.074E-01      | 1.070E-02 | 17.570  |
|         | +         | 1120.29      |     | 1.866E+00           | 6.312E-01 | 4.466E-01      | 4.836E-02 | 4.178   |
|         | +         | 1764.49      |     | 2.446E+00           | 5.133E-01 | 3.135E-01      | 2.748E-02 | 7.802   |
| PB-214  | +         | 74.82        |     | 7.022E+00           | 1.694E+00 | 1.212E+00      | 1.693E-01 | 5.795   |
|         | +         | 77.11        |     | 5.935E+00           | 1.082E+00 | 6.722E-01      | 9.563E-02 | 8.829   |
|         | +         | 242.00       |     | 3.678E+00           | 8.342E-01 | 5.701E-01      | 7.102E-02 | 6.452   |
|         | +         | 295.22       |     | 2.422E+00           | 3.811E-01 | 2.243E-01      | 2.796E-02 | 10.800  |
|         | +         | 351.93       | *   | 2.359E+00           | 3.123E-01 | 1.202E-01      | 1.366E-02 | 19.624  |
| RA-224  | +         | 240.99       | *   | 6.504E+00           | 1.426E+00 | 1.005E+00      | 1.108E-01 | 6.473   |
| RA-226  | +         | 609.32       | *   | 1.887E+00           | 2.436E-01 | 1.074E-01      | 1.070E-02 | 17.570  |
|         | +         | 1120.29      |     | 1.866E+00           | 6.312E-01 | 4.466E-01      | 4.836E-02 | 4.178   |
|         | +         | 1764.49      |     | 2.446E+00           | 5.133E-01 | 3.135E-01      | 2.748E-02 | 7.802   |
| AC-228  | +         | 338.32       |     | 2.685E+00           | 1.189E+00 | 3.813E-01      | 1.601E-01 | 7.042   |
|         | +         | 911.20       | *   | 2.666E+00           | 4.303E-01 | 2.146E-01      | 2.600E-02 | 12.419  |
|         | +         | 968.97       |     | 2.712E+00           | 7.731E-01 | 3.507E-01      | 8.616E-02 | 7.734   |
| RA-228  | +         | 338.32       |     | 2.685E+00           | 1.189E+00 | 3.813E-01      | 1.601E-01 | 7.042   |
|         | +         | 911.20       | *   | 2.666E+00           | 4.303E-01 | 2.146E-01      | 2.600E-02 | 12.419  |

---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TH-228  | +         | 968.97       |     | 2.712E+00           | 7.731E-01 | 3.507E-01      | 8.616E-02 | 7.734   |
|         | +         | 74.82        |     | 3.962E+00           | 9.035E-01 | 6.836E-01      | 7.905E-02 | 5.795   |
|         | +         | 77.11        |     | 3.367E+00           | 5.473E-01 | 3.813E-01      | 4.420E-02 | 8.829   |
|         | +         | 238.63       | *   | 2.576E+00           | 3.301E-01 | 9.377E-02      | 1.120E-02 | 27.469  |
|         | +         | 300.09       |     | 2.821E+00           | 2.163E+00 | 1.268E+00      | 7.801E-01 | 2.225   |
| TH-232  | +         | 338.32       |     | 2.685E+00           | 4.604E-01 | 3.813E-01      | 3.759E-02 | 7.042   |
|         | +         | 911.20       | *   | 2.666E+00           | 4.303E-01 | 2.146E-01      | 2.600E-02 | 12.419  |
|         | +         | 968.97       |     | 2.712E+00           | 7.731E-01 | 3.507E-01      | 8.616E-02 | 7.734   |
| TH-234  | +         | 63.29        | *   | 3.372E+00           | 2.745E+00 | 3.028E+00      | 6.005E-01 | 1.114   |
|         | +         | 92.59        |     | 4.034E+00           | 1.376E+00 | 1.047E+00      | 2.451E-01 | 3.855   |
| U-235   | +         | 89.96        |     | 3.269E+00           | 1.456E+00 | 1.321E+00      | 3.437E-01 | 2.474   |
|         | +         | 93.35        |     | 3.047E+00           | 1.060E+00 | 7.833E-01      | 1.906E-01 | 3.891   |
|         |           | 143.76       | *   | -1.441E-02          | 2.187E-01 | 3.422E-01      | 6.088E-02 | -0.042  |
|         |           | 163.33       |     | 1.153E-01           | 4.626E-01 | 7.487E-01      | 1.422E-01 | 0.154   |
|         | +         | 185.72       |     | 3.036E-01           | 8.493E-02 | 6.790E-02      | 7.349E-03 | 4.471   |
|         |           | 205.31       |     | 1.500E-01           | 6.120E-01 | 8.584E-01      | 1.662E-01 | 0.175   |
| NP-237  | +         | 86.48        | *   | 1.368E+00           | 4.432E-01 | 3.912E-01      | 9.503E-02 | 3.498   |
|         |           | 95.86        |     | -6.695E-01          | 1.157E+00 | 1.610E+00      | 4.032E-01 | -0.416  |
| U-238   | +         | 63.29        | *   | 3.372E+00           | 2.745E+00 | 3.028E+00      | 6.005E-01 | 1.114   |
|         | +         | 92.59        |     | 4.034E+00           | 1.105E+00 | 1.047E+00      | 1.217E-01 | 3.855   |
| ANH-511 | +         | 511.00       | *   | 2.167E-01           | 6.987E-02 | 4.497E-02      | 3.885E-03 | 4.818   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| BE-7    |           | 477.60       | *   | 9.714E-02           | 3.304E-01 | 5.458E-01           | 5.073E-02 | 0.178   |
| NA-22   |           | 1274.54      | *   | -4.498E-03          | 4.584E-02 | 7.360E-02           | 6.686E-03 | -0.061  |
| NA-24   |           | 1368.63      | *   | 2.318E+01           | 4.584E-02 | Half-Life too short |           |         |
| SC-46   |           | 889.28       | *   | -5.797E-03          | 3.766E-02 | 6.161E-02           | 5.725E-03 | -0.094  |
|         | +         | 1120.55      |     | 3.273E-01           | 1.085E-01 | 1.307E-01           | 1.111E-02 | 2.505   |
| V-48    |           | 944.13       |     | -6.695E-01          | 1.032E+00 | 1.628E+00           | 1.505E-01 | -0.411  |
|         |           | 983.53       | *   | -1.591E-02          | 8.171E-02 | 1.325E-01           | 1.211E-02 | -0.120  |
|         |           | 1312.11      |     | -1.776E-02          | 9.320E-02 | 1.480E-01           | 1.395E-02 | -0.120  |
| CR-51   |           | 320.08       | *   | -1.810E-01          | 4.131E-01 | 6.746E-01           | 7.159E-02 | -0.268  |
| MN-54   |           | 834.85       | *   | -2.682E-02          | 3.857E-02 | 6.049E-02           | 5.489E-03 | -0.443  |
| CO-56   |           | 846.77       | *   | -2.266E-02          | 3.784E-02 | 6.036E-02           | 5.508E-03 | -0.375  |
|         |           | 1037.84      |     | -2.011E-01          | 3.032E-01 | 4.735E-01           | 4.440E-02 | -0.425  |
|         | +         | 1238.28      |     | 1.917E-01           | 1.374E-01 | 1.742E-01           | 1.566E-02 | 1.100   |
|         |           | 1771.35      |     | 1.032E-01           | 2.289E-01 | 3.496E-01           | 3.055E-02 | 0.295   |
| CO-57   |           | 122.06       | *   | -2.075E-02          | 2.663E-02 | 4.226E-02           | 4.257E-03 | -0.491  |
|         |           | 136.47       |     | 1.665E-01           | 2.178E-01 | 3.586E-01           | 3.810E-02 | 0.464   |
| CO-58   |           | 810.76       | *   | -2.852E-02          | 3.811E-02 | 6.042E-02           | 5.432E-03 | -0.472  |
| FE-59   |           | 1099.45      | *   | -1.679E-02          | 1.008E-01 | 1.628E-01           | 1.519E-02 | -0.103  |
|         |           | 1291.59      |     | -3.403E-02          | 1.278E-01 | 2.022E-01           | 2.088E-02 | -0.168  |
| CO-60   |           | 1173.23      |     | -3.773E-02          | 4.749E-02 | 7.337E-02           | 5.972E-03 | -0.514  |
|         |           | 1332.49      | *   | 2.159E-02           | 3.818E-02 | 6.424E-02           | 6.176E-03 | 0.336   |
| ZN-65   |           | 1115.54      | *   | 7.972E-02           | 9.307E-02 | 1.401E-01           | 1.197E-02 | 0.569   |
| SE-75   |           | 121.12       |     | -9.899E-02          | 1.408E-01 | 2.238E-01           | 2.740E-02 | -0.442  |

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         |           | 136.00       |     | 9.908E-03           | 4.251E-02 | 6.925E-02      | 7.011E-03 | 0.143   |
|         |           | 264.66       | *   | -3.564E-02          | 5.354E-02 | 7.539E-02      | 8.267E-03 | -0.473  |
|         |           | 279.54       |     | 1.972E-01           | 1.318E-01 | 2.009E-01      | 2.224E-02 | 0.982   |
|         |           | 400.66       |     | -6.477E-02          | 2.603E-01 | 4.236E-01      | 4.641E-02 | -0.153  |
| SR-85   |           | 514.00       | *   | 1.223E-01           | 4.737E-02 | 7.452E-02      | 6.438E-03 | 1.641   |
| Y-88    |           | 898.04       |     | 4.861E-03           | 4.117E-02 | 6.843E-02      | 6.408E-03 | 0.071   |
|         |           | 1836.06      | *   | 1.189E-02           | 3.206E-02 | 5.503E-02      | 4.635E-03 | 0.216   |
| Y-91    |           | 1204.77      | *   | -4.315E+00          | 2.343E+01 | 3.759E+01      | 3.169E+00 | -0.115  |
| NB-94   |           | 702.65       | *   | 5.245E-03           | 3.334E-02 | 5.616E-02      | 4.742E-03 | 0.093   |
|         |           | 871.09       |     | -2.276E-02          | 3.028E-02 | 4.752E-02      | 4.383E-03 | -0.479  |
| NB-95   |           | 765.81       | *   | 1.049E-01           | 5.174E-02 | 8.218E-02      | 7.200E-03 | 1.277   |
| NB-95M  |           | 235.69       | *   | 8.735E-01           | 1.941E-01 | 2.787E-01      | 3.358E-02 | 3.134   |
| ZR-95   |           | 724.19       |     | 2.321E-01           | 1.075E-01 | 1.735E-01      | 1.611E-02 | 1.338   |
|         |           | 756.73       | *   | 1.064E-01           | 7.712E-02 | 1.357E-01      | 1.304E-02 | 0.784   |
| MO-99   |           | 140.51       |     | -1.326E+02          | 7.993E+01 | 1.101E+02      | 2.679E+01 | -1.204  |
|         |           | 181.07       |     | -6.294E+01          | 6.649E+01 | 8.791E+01      | 1.747E+01 | -0.716  |
|         |           | 366.42       |     | 9.708E+00           | 3.035E+02 | 5.015E+02      | 4.596E+01 | 0.019   |
|         |           | 739.50       | *   | 1.762E+01           | 3.509E+01 | 5.986E+01      | 9.437E+00 | 0.294   |
|         |           | 777.92       |     | -9.418E+01          | 1.151E+02 | 1.678E+02      | 1.480E+01 | -0.561  |
| TC-99M  |           | 140.51       | *   | -1.390E+16          | 1.151E+02 | Half-Life      | too short |         |
| RU-103  |           | 497.08       | *   | -2.860E-02          | 4.200E-02 | 6.580E-02      | 9.198E-03 | -0.435  |
|         | +         | 610.33       |     | 2.104E+01           | 3.833E+00 | 3.076E+00      | 5.000E-01 | 6.841   |
| RH-106  |           | 621.93       | *   | 1.956E-02           | 3.107E-01 | 5.015E-01      | 6.577E-02 | 0.039   |
|         |           | 1050.41      |     | -6.302E-01          | 2.428E+00 | 3.902E+00      | 3.468E-01 | -0.161  |
| RU-106  |           | 621.93       | *   | 1.956E-02           | 3.107E-01 | 5.015E-01      | 4.214E-02 | 0.039   |
|         |           | 1050.41      |     | -6.302E-01          | 2.428E+00 | 3.902E+00      | 3.468E-01 | -0.161  |
| AG-108M |           | 433.94       | *   | -2.832E-02          | 2.990E-02 | 4.683E-02      | 4.138E-03 | -0.605  |
|         |           | 614.28       |     | -1.880E-02          | 4.068E-02 | 5.448E-02      | 4.752E-03 | -0.345  |
|         |           | 722.91       |     | -2.141E-03          | 3.716E-02 | 5.327E-02      | 4.702E-03 | -0.040  |
| AG-110M |           | 657.76       | *   | -1.822E-02          | 3.158E-02 | 5.140E-02      | 4.374E-03 | -0.354  |
|         |           | 677.62       |     | 4.967E-02           | 3.057E-01 | 5.163E-01      | 4.422E-02 | 0.096   |
|         |           | 706.68       |     | -2.587E-02          | 2.111E-01 | 3.511E-01      | 3.060E-02 | -0.074  |
|         |           | 763.94       |     | 1.078E-01           | 1.738E-01 | 2.580E-01      | 2.318E-02 | 0.418   |
|         |           | 884.68       |     | -9.582E-03          | 4.712E-02 | 7.689E-02      | 7.330E-03 | -0.125  |
|         |           | 937.49       |     | 1.588E-02           | 1.142E-01 | 1.895E-01      | 1.810E-02 | 0.084   |
|         |           | 1384.29      |     | -1.145E-01          | 1.734E-01 | 2.271E-01      | 2.235E-02 | -0.504  |
|         |           | 1505.03      |     | -1.463E-01          | 2.703E-01 | 4.265E-01      | 4.076E-02 | -0.343  |
| SN-113  |           | 391.69       | *   | -4.929E-03          | 4.764E-02 | 7.809E-02      | 6.782E-03 | -0.063  |
| CD-115  |           | 260.90       |     | 1.981E-04           | 4.764E-02 | Half-Life      | too short |         |
|         |           | 492.35       |     | -1.915E-05          | 4.764E-02 | Half-Life      | too short |         |
|         |           | 527.90       | *   | 9.989E-06           | 4.764E-02 | Half-Life      | too short |         |
| SN-117M |           | 156.02       |     | 2.290E+00           | 3.023E+00 | 4.954E+00      | 5.163E-01 | 0.462   |
|         |           | 158.56       | *   | -2.557E-03          | 7.380E-02 | 1.188E-01      | 1.246E-02 | -0.022  |
| TE-123M |           | 159.00       | *   | 3.952E-03           | 3.130E-02 | 5.060E-02      | 5.332E-03 | 0.078   |
| SB-124  |           | 602.73       |     | 5.636E-03           | 4.421E-02 | 6.196E-02      | 5.251E-03 | 0.091   |
|         |           | 645.85       |     | -6.634E-01          | 5.338E-01 | 7.941E-01      | 6.999E-02 | -0.835  |
|         |           | 722.78       |     | -2.267E-02          | 3.926E-01 | 5.629E-01      | 4.923E-02 | -0.040  |
|         |           | 1690.97      | *   | -2.702E-02          | 7.116E-02 | 1.115E-01      | 1.050E-02 | -0.242  |
| SB-125  |           | 427.87       | *   | 5.749E-02           | 9.258E-02 | 1.553E-01      | 1.352E-02 | 0.370   |



----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         | +         | 463.37       |     | 8.008E-01           | 3.750E-01 | 5.365E-01      | 4.970E-02 | 1.493   |
|         |           | 600.60       |     | -1.736E-01          | 1.795E-01 | 2.649E-01      | 2.418E-02 | -0.655  |
|         |           | 635.95       |     | -3.295E-02          | 2.674E-01 | 4.267E-01      | 3.868E-02 | -0.077  |
| TE-125M |           | 109.28       | *   | 4.083E+00           | 1.080E+01 | 1.776E+01      | 2.111E+00 | 0.230   |
| I-126   |           | 388.63       |     | 1.497E-01           | 2.392E-01 | 3.778E-01      | 3.215E-02 | 0.396   |
|         |           | 666.33       | *   | 9.956E-02           | 2.577E-01 | 4.400E-01      | 3.629E-02 | 0.226   |
|         |           | 753.82       |     | 3.525E+00           | 2.290E+00 | 4.059E+00      | 3.533E-01 | 0.868   |
| SB-126  |           | 414.70       |     | -5.460E-02          | 1.110E-01 | 1.530E-01      | 1.300E-02 | -0.357  |
|         |           | 666.50       |     | 4.002E-02           | 8.975E-02 | 1.536E-01      | 1.267E-02 | 0.261   |
|         |           | 695.00       |     | 2.573E-03           | 9.321E-02 | 1.562E-01      | 1.313E-02 | 0.016   |
|         |           | 697.00       |     | 5.955E-02           | 3.259E-01 | 5.501E-01      | 4.628E-02 | 0.108   |
|         |           | 720.70       | *   | 2.350E-03           | 1.870E-01 | 2.696E-01      | 2.301E-02 | 0.009   |
|         |           | 856.80       |     | 4.761E-01           | 6.767E-01 | 1.014E+00      | 9.296E-02 | 0.469   |
| SB-127  |           | 252.40       |     | 2.198E+00           | 9.644E+00 | 1.619E+01      | 6.878E+00 | 0.136   |
|         |           | 473.00       |     | -4.496E-01          | 3.477E+00 | 5.637E+00      | 7.901E-01 | -0.080  |
|         |           | 685.70       | *   | 1.082E-01           | 2.788E+00 | 4.678E+00      | 5.881E-01 | 0.023   |
|         |           | 783.70       |     | 8.254E+00           | 8.962E+00 | 1.356E+01      | 1.869E+00 | 0.609   |
| I-131   |           | 80.19        |     | 6.186E+00           | 1.180E+01 | 1.260E+01      | 1.490E+00 | 0.491   |
|         |           | 284.31       |     | -9.141E-01          | 2.221E+00 | 3.552E+00      | 3.959E-01 | -0.257  |
|         |           | 364.49       | *   | 1.508E-01           | 1.679E-01 | 2.856E-01      | 2.766E-02 | 0.528   |
|         |           | 636.99       |     | -8.681E-01          | 2.287E+00 | 3.597E+00      | 3.196E-01 | -0.241  |
| TE-132  |           | 49.72        |     | -2.038E+01          | 1.160E+02 | 1.918E+02      | 3.109E+01 | -0.106  |
|         |           | 111.76       |     | -6.194E+01          | 9.027E+01 | 1.439E+02      | 1.940E+01 | -0.430  |
|         |           | 116.30       |     | 8.682E+01           | 7.819E+01 | 1.294E+02      | 1.736E+01 | 0.671   |
|         |           | 228.16       | *   | 3.429E-01           | 1.949E+00 | 3.292E+00      | 5.968E-01 | 0.104   |
| BA-133  |           | 81.00        |     | 3.504E-03           | 1.635E-01 | 1.701E-01      | 2.976E-02 | 0.021   |
|         | +         | 276.40       |     | 6.187E-01           | 4.767E-01 | 6.540E-01      | 1.018E-01 | 0.946   |
|         |           | 302.85       |     | 1.888E-01           | 1.660E-01 | 2.489E-01      | 3.581E-02 | 0.759   |
|         |           | 356.01       | *   | 2.246E-02           | 4.448E-02 | 6.543E-02      | 8.840E-03 | 0.343   |
|         |           | 383.85       |     | 6.268E-02           | 2.999E-01 | 4.977E-01      | 6.197E-02 | 0.126   |
| I-133   |           | 529.87       | *   | 1.732E-01           | 2.999E-01 | Half-Life      | too short |         |
|         |           | 875.33       |     | 2.037E+00           | 2.999E-01 | Half-Life      | too short |         |
|         |           | 1298.22      |     | -1.648E+00          | 2.999E-01 | Half-Life      | too short |         |
| CS-134  |           | 563.25       |     | 2.656E-01           | 3.624E-01 | 6.053E-01      | 5.244E-02 | 0.439   |
|         |           | 569.33       |     | 1.937E-01           | 2.028E-01 | 3.412E-01      | 2.964E-02 | 0.568   |
|         |           | 604.72       |     | 3.451E-04           | 3.579E-02 | 4.971E-02      | 4.220E-03 | 0.007   |
|         |           | 795.86       | *   | 1.210E-01           | 5.073E-02 | 8.852E-02      | 7.934E-03 | 1.366   |
|         |           | 801.95       |     | -9.472E-02          | 4.155E-01 | 6.404E-01      | 5.749E-02 | -0.148  |
|         |           | 1365.19      |     | 9.285E-02           | 1.057E+00 | 1.780E+00      | 1.779E-01 | 0.052   |
| CS-135  |           | 268.22       | *   | 3.962E-01           | 1.898E-01 | 2.905E-01      | 3.486E-02 | 1.364   |
| I-135   |           | 546.56       |     | 5.503E+14           | 1.898E-01 | Half-Life      | too short |         |
|         |           | 836.80       |     | 4.632E+14           | 1.898E-01 | Half-Life      | too short |         |
|         |           | 1038.76      |     | -2.063E+14          | 1.898E-01 | Half-Life      | too short |         |
|         |           | 1131.51      |     | -2.846E+14          | 1.898E-01 | Half-Life      | too short |         |
|         |           | 1260.41      | *   | -1.267E+14          | 1.898E-01 | Half-Life      | too short |         |
|         |           | 1457.56      |     | 9.523E+16           | 1.898E-01 | Half-Life      | too short |         |
|         |           | 1678.03      |     | -3.170E+13          | 1.898E-01 | Half-Life      | too short |         |
|         |           | 1791.20      |     | 6.687E+14           | 1.898E-01 | Half-Life      | too short |         |
| CS-136  |           | 153.25       |     | -3.319E-02          | 1.141E+00 | 1.839E+00      | 2.164E-01 | -0.018  |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         |           | 176.60       |     | 4.750E-01           | 6.706E-01 | 1.094E+00      | 1.256E-01 | 0.434   |
|         |           | 273.65       |     | -3.704E-01          | 1.114E+00 | 1.054E+00      | 1.208E-01 | -0.351  |
|         |           | 340.55       |     | 1.254E+00           | 2.722E-01 | 4.060E-01      | 4.101E-02 | 3.088   |
|         |           | 818.51       |     | -3.277E-02          | 8.606E-02 | 1.396E-01      | 1.258E-02 | -0.235  |
|         |           | 1048.07      | *   | -1.596E-01          | 1.282E-01 | 1.907E-01      | 1.764E-02 | -0.837  |
|         |           | 1235.36      |     | 1.598E+00           | 9.342E-01 | 1.424E+00      | 1.685E-01 | 1.123   |
| BA-137M |           | 661.66       | *   | -2.603E-02          | 3.257E-02 | 5.239E-02      | 4.307E-03 | -0.497  |
| CS-137  |           | 661.66       | *   | -2.750E-02          | 3.440E-02 | 5.534E-02      | 4.559E-03 | -0.497  |
| CE-139  |           | 165.86       | *   | -1.395E-02          | 3.257E-02 | 5.174E-02      | 5.524E-03 | -0.270  |
| BA-140  |           | 162.66       |     | -1.948E-01          | 1.100E+00 | 1.762E+00      | 1.950E-01 | -0.111  |
|         |           | 304.85       |     | 1.293E-01           | 1.919E+00 | 2.782E+00      | 8.310E-01 | 0.046   |
|         |           | 423.72       |     | -7.352E-01          | 2.505E+00 | 4.038E+00      | 1.327E+00 | -0.182  |
|         |           | 537.26       | *   | 7.466E-02           | 3.196E-01 | 5.226E-01      | 1.773E-01 | 0.143   |
| LA-140  | +         | 328.76       |     | 9.931E-01           | 5.236E-01 | 7.112E-01      | 7.458E-02 | 1.396   |
|         |           | 487.02       |     | 3.045E-03           | 1.715E-01 | 2.796E-01      | 2.564E-02 | 0.011   |
|         |           | 815.77       |     | -8.904E-02          | 3.802E-01 | 6.223E-01      | 6.202E-02 | -0.143  |
|         |           | 1596.21      | *   | 1.030E-01           | 9.876E-02 | 1.626E-01      | 1.524E-02 | 0.633   |
| CE-141  |           | 145.44       | *   | 6.141E-02           | 7.229E-02 | 1.189E-01      | 1.229E-02 | 0.516   |
| CE-143  |           | 57.36        |     | -7.887E-03          | 7.229E-02 | Half-Life      | too short |         |
|         |           | 293.27       | *   | 1.405E-02           | 7.229E-02 | Half-Life      | too short |         |
|         |           | 664.57       |     | 7.383E-03           | 7.229E-02 | Half-Life      | too short |         |
|         |           | 721.93       |     | -4.086E-04          | 7.229E-02 | Half-Life      | too short |         |
| CE-144  |           | 80.12        |     | 2.835E+00           | 4.428E+00 | 4.753E+00      | 5.587E-01 | 0.596   |
|         |           | 133.52       | *   | -4.119E-01          | 2.233E-01 | 3.281E-01      | 5.295E-02 | -1.255  |
| PM-144  |           | 476.78       |     | 1.102E-02           | 6.359E-02 | 1.045E-01      | 9.797E-03 | 0.105   |
|         |           | 618.01       |     | 1.029E-02           | 3.303E-02 | 5.254E-02      | 4.554E-03 | 0.196   |
|         |           | 696.49       | *   | 5.570E-03           | 3.287E-02 | 5.545E-02      | 4.666E-03 | 0.100   |
| PR-144  |           | 696.51       | *   | 4.686E-01           | 2.463E+00 | 4.158E+00      | 3.497E-01 | 0.113   |
|         |           | 1489.16      |     | -7.862E-01          | 1.210E+01 | 2.000E+01      | 1.916E+00 | -0.039  |
| PM-146  |           | 453.88       | *   | 1.590E-02           | 4.219E-02 | 7.002E-02      | 7.405E-03 | 0.227   |
|         |           | 633.25       |     | -6.049E-01          | 1.448E+00 | 2.245E+00      | 8.563E-01 | -0.269  |
|         |           | 735.93       |     | -1.027E-01          | 1.414E-01 | 2.222E-01      | 6.228E-02 | -0.462  |
|         |           | 747.24       |     | -3.219E-02          | 9.121E-02 | 1.491E-01      | 2.179E-02 | -0.216  |
| ND-147  | +         | 91.11        |     | 1.397E+00           | 5.347E-01 | 7.513E-01      | 9.304E-02 | 1.859   |
|         |           | 319.41       |     | -2.802E+00          | 4.436E+00 | 7.188E+00      | 7.363E-01 | -0.390  |
|         |           | 531.02       | *   | 7.386E-01           | 7.224E-01 | 1.216E+00      | 1.819E-01 | 0.607   |
| PM-149  |           | 285.90       | *   | 1.153E-07           | 7.224E-01 | Half-Life      | too short |         |
| EU-152  |           | 121.78       |     | -7.203E-02          | 7.622E-02 | 1.201E-01      | 1.344E-02 | -0.600  |
|         |           | 244.70       |     | 5.225E-01           | 3.792E-01 | 5.774E-01      | 6.364E-02 | 0.905   |
|         |           | 344.28       | *   | -2.712E-02          | 1.068E-01 | 1.586E-01      | 1.614E-02 | -0.171  |
|         |           | 778.90       |     | -4.580E-02          | 2.714E-01 | 4.000E-01      | 3.529E-02 | -0.114  |
|         | +         | 964.08       |     | 9.884E-01           | 3.676E-01 | 5.399E-01      | 4.966E-02 | 1.831   |
|         |           | 1085.87      |     | -2.088E-01          | 3.801E-01 | 5.976E-01      | 5.204E-02 | -0.349  |
|         |           | 1112.07      |     | -5.648E-02          | 3.278E-01 | 4.498E-01      | 3.849E-02 | -0.126  |
|         | +         | 1408.01      |     | 5.006E-01           | 2.425E-01 | 3.216E-01      | 3.099E-02 | 1.556   |
| GD-153  |           | 69.67        |     | 1.994E+00           | 2.507E+00 | 3.706E+00      | 4.231E-01 | 0.538   |
|         |           | 97.43        | *   | -7.303E-03          | 1.040E-01 | 1.487E-01      | 1.641E-02 | -0.049  |
|         |           | 103.18       |     | -1.815E-01          | 1.226E-01 | 1.904E-01      | 2.013E-02 | -0.953  |
| EU-154  |           | 123.07       |     | -2.541E-02          | 5.337E-02 | 8.547E-02      | 1.066E-02 | -0.297  |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         |           | 723.31       |     | 8.059E-03           | 1.760E-01 | 2.543E-01      | 2.398E-02 | 0.032   |
|         |           | 873.19       |     | 7.333E-03           | 2.603E-01 | 4.312E-01      | 5.323E-02 | 0.017   |
|         |           | 996.26       |     | -2.941E-01          | 3.543E-01 | 5.451E-01      | 9.654E-02 | -0.540  |
|         |           | 1004.73      |     | -9.774E-02          | 2.099E-01 | 3.340E-01      | 4.000E-02 | -0.293  |
|         |           | 1274.44      | *   | 3.427E-02           | 1.259E-01 | 2.071E-01      | 2.429E-02 | 0.165   |
| EU-155  | +         | 86.55        |     | 5.570E-01           | 1.377E-01 | 2.112E-01      | 2.605E-02 | 2.638   |
|         |           | 105.31       | *   | 2.084E-02           | 1.124E-01 | 1.843E-01      | 1.941E-02 | 0.113   |
| TB-160  | +         | 86.79        |     | 1.539E+00           | 3.799E-01 | 5.775E-01      | 7.100E-02 | 2.665   |
|         |           | 197.04       |     | 4.367E-01           | 6.275E-01 | 1.020E+00      | 1.112E-01 | 0.428   |
|         |           | 215.65       |     | 2.416E-01           | 8.406E-01 | 1.350E+00      | 1.485E-01 | 0.179   |
|         |           | 298.57       |     | 4.127E-01           | 1.383E-01 | 2.292E-01      | 2.425E-02 | 1.800   |
|         |           | 879.36       | *   | 8.645E-03           | 1.410E-01 | 2.338E-01      | 2.164E-02 | 0.037   |
|         |           | 962.29       |     | 1.339E+00           | 6.231E-01 | 1.002E+00      | 9.223E-02 | 1.336   |
|         |           | 966.15       |     | 2.061E+00           | 3.285E-01 | 5.600E-01      | 5.147E-02 | 3.680   |
|         |           | 1177.93      |     | 4.287E-01           | 3.980E-01 | 6.827E-01      | 5.587E-02 | 0.628   |
|         |           | 1271.85      |     | -1.066E-01          | 7.445E-01 | 1.191E+00      | 1.078E-01 | -0.089  |
| HO-166M |           | 80.57        |     | 1.116E-01           | 4.705E-01 | 4.955E-01      | 5.838E-02 | 0.225   |
|         |           | 184.41       |     | 2.186E-01           | 4.884E-02 | 6.978E-02      | 7.545E-03 | 3.133   |
|         |           | 280.46       |     | 6.474E-02           | 9.733E-02 | 1.450E-01      | 1.566E-02 | 0.446   |
|         | +         | 410.95       |     | 5.743E-01           | 3.525E-01 | 4.271E-01      | 3.625E-02 | 1.345   |
|         |           | 711.68       | *   | -2.242E-02          | 5.703E-02 | 9.343E-02      | 7.932E-03 | -0.240  |
|         |           | 752.31       |     | -3.467E-02          | 2.748E-01 | 4.552E-01      | 3.959E-02 | -0.076  |
|         |           | 810.29       |     | -2.815E-02          | 5.462E-02 | 8.792E-02      | 7.885E-03 | -0.320  |
| TA-182  |           | 67.75        |     | -2.844E-01          | 2.159E-01 | 2.439E-01      | 2.784E-02 | -1.166  |
|         |           | 100.11       |     | 3.044E-01           | 2.192E-01 | 3.295E-01      | 3.557E-02 | 0.924   |
|         |           | 152.43       |     | 1.906E-01           | 3.739E-01 | 6.106E-01      | 6.314E-02 | 0.312   |
|         |           | 222.11       |     | 1.966E-03           | 3.753E-01 | 6.319E-01      | 6.964E-02 | 0.003   |
|         |           | 1121.30      |     | 8.749E-01           | 1.983E-01 | 3.539E-01      | 3.008E-02 | 2.472   |
|         |           | 1189.05      |     | 7.406E-02           | 3.154E-01 | 5.190E-01      | 4.300E-02 | 0.143   |
|         |           | 1221.41      | *   | -1.278E-02          | 2.066E-01 | 3.336E-01      | 2.864E-02 | -0.038  |
|         |           | 1231.02      |     | 8.974E-02           | 5.871E-01 | 8.231E-01      | 7.138E-02 | 0.109   |
| IR-192  | +         | 295.96       |     | 1.867E+00           | 2.680E-01 | 3.190E-01      | 3.403E-02 | 5.851   |
|         |           | 308.46       |     | 3.434E-02           | 9.942E-02 | 1.671E-01      | 1.749E-02 | 0.205   |
|         |           | 316.51       | *   | 1.799E-02           | 3.577E-02 | 6.036E-02      | 6.224E-03 | 0.298   |
|         |           | 468.07       |     | 3.844E-02           | 7.673E-02 | 1.117E-01      | 1.033E-02 | 0.344   |
| HG-203  |           | 70.83        |     | 3.412E+00           | 2.102E+00 | 3.065E+00      | 5.433E-01 | 1.113   |
|         |           | 72.87        |     | 4.553E+00           | 1.400E+00 | 1.933E+00      | 3.338E-01 | 2.356   |
|         |           | 279.20       | *   | 9.882E-02           | 4.947E-02 | 7.604E-02      | 8.356E-03 | 1.300   |
| BI-207  |           | 72.81        |     | 9.105E-01           | 2.707E-01 | 4.147E-01      | 4.749E-02 | 2.196   |
|         | +         | 74.97        |     | 1.142E+00           | 2.601E-01 | 2.921E-01      | 3.362E-02 | 3.910   |
|         |           | 569.70       |     | 3.351E-02           | 3.094E-02 | 5.233E-02      | 4.483E-03 | 0.640   |
|         |           | 1063.66      | *   | 3.415E-02           | 5.346E-02 | 9.055E-02      | 7.989E-03 | 0.377   |
|         |           | 1770.23      |     | 1.369E-01           | 4.548E-01 | 6.745E-01      | 5.896E-02 | 0.203   |
| PB-210  |           | 46.54        | *   | -6.887E+00          | 1.045E+01 | 1.633E+01      | 2.010E+00 | -0.422  |
| PB-211  |           | 404.85       | *   | 1.130E-01           | 7.949E-01 | 1.138E+00      | 5.503E-01 | 0.099   |
|         |           | 427.09       |     | 9.743E-01           | 1.615E+00 | 2.606E+00      | 1.205E+00 | 0.374   |
|         |           | 832.01       |     | -3.107E-01          | 9.754E-01 | 1.567E+00      | 8.139E-01 | -0.198  |
| RN-219  | +         | 271.23       |     | 7.832E-01           | 3.731E-01 | 4.565E-01      | 5.579E-02 | 1.716   |
|         |           | 401.81       | *   | -1.264E-01          | 4.378E-01 | 6.688E-01      | 9.884E-02 | -0.189  |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| RA-223  |           | 81.07        |     | -6.578E-03          | 3.695E-01 | 3.837E-01      | 4.533E-02 | -0.017  |
|         |           | 83.79        |     | 1.397E-01           | 2.180E-01 | 2.334E-01      | 2.805E-02 | 0.599   |
|         |           | 94.87        |     | 2.091E+00           | 6.170E-01 | 9.046E-01      | 1.024E-01 | 2.311   |
|         |           | 144.24       |     | 5.890E-02           | 7.350E-01 | 1.155E+00      | 1.275E-01 | 0.051   |
|         |           | 154.21       |     | 7.228E-03           | 4.159E-01 | 6.710E-01      | 7.432E-02 | 0.011   |
|         | +         | 269.46       |     | 6.085E-01           | 2.881E-01 | 3.558E-01      | 3.926E-02 | 1.710   |
| AC-227  |           | 323.87       | *   | 5.284E-01           | 7.263E-01 | 1.075E+00      | 1.951E-01 | 0.492   |
|         | +         | 338.28       |     | 1.066E+01           | 2.037E+00 | 2.454E+00      | 3.186E-01 | 4.342   |
|         |           | 79.69        |     | 2.874E+00           | 2.344E+00 | 2.526E+00      | 4.795E-01 | 1.138   |
|         |           | 235.96       |     | 1.672E+00           | 2.895E-01 | 3.640E-01      | 4.524E-02 | 4.594   |
|         |           | 256.23       | *   | -7.752E-02          | 2.557E-01 | 4.240E-01      | 5.867E-02 | -0.183  |
|         | +         | 299.98       |     | 3.104E+00           | 1.486E+00 | 1.677E+00      | 2.364E-01 | 1.851   |
| TH-227  |           | 304.50       |     | 3.781E-01           | 1.831E+00 | 2.670E+00      | 4.693E-01 | 0.142   |
|         |           | 334.37       |     | -5.631E-01          | 2.255E+00 | 2.785E+00      | 4.555E-01 | -0.202  |
|         |           | 79.80        |     | 3.404E+00           | 3.013E+00 | 3.215E+00      | 7.454E-01 | 1.059   |
|         |           | 235.96       |     | 1.672E+00           | 2.838E-01 | 3.640E-01      | 4.348E-02 | 4.594   |
|         |           | 256.23       | *   | -7.752E-02          | 2.557E-01 | 4.240E-01      | 6.449E-02 | -0.183  |
|         | +         | 299.98       |     | 3.104E+00           | 1.486E+00 | 1.677E+00      | 2.364E-01 | 1.851   |
| TH-229  |           | 304.50       |     | 3.781E-01           | 1.831E+00 | 2.670E+00      | 4.693E-01 | 0.142   |
|         |           | 334.37       |     | -5.631E-01          | 2.255E+00 | 2.785E+00      | 4.555E-01 | -0.202  |
|         |           | 85.43        |     | 1.268E+00           | 2.994E-01 | 4.289E-01      | 5.218E-02 | 2.956   |
|         | +         | 88.47        |     | 7.070E-01           | 1.746E-01 | 2.683E-01      | 3.307E-02 | 2.635   |
|         |           | 193.51       | *   | 6.394E-02           | 5.598E-01 | 8.985E-01      | 9.775E-02 | 0.071   |
|         |           | 210.85       |     | 2.647E+00           | 1.069E+00 | 1.644E+00      | 1.806E-01 | 1.610   |
| PA-231  |           | 283.69       | *   | -2.175E-01          | 1.518E+00 | 2.378E+00      | 3.792E-01 | -0.091  |
|         | +         | 301.36       |     | 1.994E+00           | 9.516E-01 | 1.084E+00      | 1.472E-01 | 1.840   |
| TH-231  |           | 81.07        |     | -6.578E-03          | 3.695E-01 | 3.837E-01      | 4.533E-02 | -0.017  |
|         |           | 83.79        |     | 1.397E-01           | 2.180E-01 | 2.334E-01      | 2.805E-02 | 0.599   |
|         |           | 94.87        |     | 2.091E+00           | 6.170E-01 | 9.046E-01      | 1.024E-01 | 2.311   |
|         |           | 144.24       |     | 5.890E-02           | 7.350E-01 | 1.155E+00      | 1.275E-01 | 0.051   |
|         |           | 154.21       |     | 7.228E-03           | 4.159E-01 | 6.710E-01      | 7.432E-02 | 0.011   |
|         | +         | 269.46       |     | 6.085E-01           | 2.881E-01 | 3.558E-01      | 3.926E-02 | 1.710   |
| PA-233  |           | 323.87       | *   | 5.284E-01           | 7.263E-01 | 1.075E+00      | 1.951E-01 | 0.492   |
|         | +         | 338.28       |     | 1.066E+01           | 2.037E+00 | 2.454E+00      | 3.186E-01 | 4.342   |
|         | +         | 300.13       |     | 1.404E+00           | 6.808E-01 | 7.611E-01      | 1.220E-01 | 1.845   |
|         |           | 311.90       | *   | -2.613E-02          | 6.579E-02 | 1.056E-01      | 1.118E-02 | -0.247  |
|         |           | 340.48       |     | 4.553E+00           | 1.388E+00 | 1.400E+00      | 3.433E-01 | 3.252   |
|         |           | 94.67        |     | 9.197E-01           | 2.405E-01 | 3.385E-01      | 4.885E-02 | 2.717   |
| PA-234  |           | 98.44        |     | 1.044E-01           | 1.289E-01 | 1.642E-01      | 9.229E-02 | 0.636   |
|         |           | 111.00       |     | 1.660E-02           | 1.925E-01 | 3.143E-01      | 4.172E-02 | 0.053   |
|         |           | 131.20       |     | 5.055E-02           | 1.119E-01 | 1.832E-01      | 1.839E-02 | 0.276   |
|         |           | 569.50       |     | 3.578E-01           | 2.754E-01 | 4.693E-01      | 4.020E-02 | 0.762   |
|         |           | 733.00       |     | 3.216E-01           | 3.928E-01 | 5.912E-01      | 1.312E-01 | 0.544   |
|         |           | 880.51       |     | 4.464E-02           | 2.794E-01 | 4.524E-01      | 4.189E-02 | 0.099   |
|         |           | 883.24       |     | -1.325E-01          | 2.898E-01 | 4.426E-01      | 2.979E-01 | -0.299  |
|         |           | 926.50       |     | 3.866E-02           | 1.671E-01 | 2.787E-01      | 7.109E-02 | 0.139   |
|         |           | 946.00       | *   | 3.476E-02           | 2.949E-01 | 4.887E-01      | 9.313E-02 | 0.071   |
|         |           | 949.00       |     | 3.973E-01           | 4.329E-01 | 7.477E-01      | 6.905E-02 | 0.531   |
|         | +         | 766.42       |     | 3.330E+01           | 2.236E+01 | 2.153E+01      | 1.093E+01 | 1.547   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| NP-239  | 1001.03   | *            |     | 2.690E+00           | 4.921E+00 | 7.754E+00      | 8.040E-01 | 0.347   |
|         | 99.53     |              |     | 2.499E-01           | 2.066E-01 | 2.959E-01      | 3.209E-02 | 0.845   |
|         | 103.37    |              |     | -4.429E-02          | 1.066E-01 | 1.722E-01      | 1.818E-02 | -0.257  |
|         | 106.12    |              |     | 3.188E-02           | 8.940E-02 | 1.471E-01      | 1.531E-02 | 0.217   |
|         | 117.23    | *            |     | 2.658E-01           | 4.191E-01 | 6.915E-01      | 6.979E-02 | 0.384   |
| AM-241  | 228.18    |              |     | 3.835E-02           | 2.230E-01 | 3.767E-01      | 4.156E-02 | 0.102   |
|         | 277.60    | +            |     | 3.057E-01           | 2.330E-01 | 3.235E-01      | 3.503E-02 | 0.945   |
|         | 59.54     | *            |     | 2.955E-01           | 2.717E-01 | 4.069E-01      | 4.777E-02 | 0.726   |
| CM-247  | 278.00    | +            |     | 1.298E+00           | 9.897E-01 | 1.373E+00      | 1.486E-01 | 0.946   |
|         | 287.50    |              |     | -5.671E-01          | 1.334E+00 | 2.015E+00      | 2.161E-01 | -0.281  |
|         | 402.40    | *            |     | -4.993E-03          | 4.133E-02 | 6.127E-02      | 5.181E-03 | -0.082  |
| CF-249  | 252.80    |              |     | 2.257E-01           | 9.692E-01 | 1.634E+00      | 1.797E-01 | 0.138   |
|         | 333.37    |              |     | 8.006E-02           | 3.024E-01 | 2.986E-01      | 2.975E-02 | 0.268   |
|         | 388.16    | *            |     | 6.292E-02           | 4.488E-02 | 7.246E-02      | 6.176E-03 | 0.868   |
| CF-251  | 177.52    | *            |     | 1.099E-01           | 1.456E-01 | 2.282E-01      | 2.456E-02 | 0.482   |
|         | 227.38    |              |     | 8.365E-04           | 3.672E-01 | 6.177E-01      | 6.814E-02 | 0.001   |
|         | 285.41    |              |     | -1.393E+00          | 2.156E+00 | 3.510E+00      | 3.773E-01 | -0.397  |

# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964005      *
* Acquisition date   : 10-MAR-2010 23:10:07 Detector SN#                   *
* Detector ID        : GAM15 Sensitivity : 5.000                          *
* Geometry           : CAN Energy tolerance: 1.500                        *
* Elapsed live time  : 0 04:00:00.00 Abundance limit : 75.000             *
* Elapsed real time  : 0 04:00:03.08 Half life ratio : 8.000              *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date       : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID         : G247964005 Analyst initials: MXR1                   *
* Batch Number      : 958216 Sample Quantity : 1.2399E+02 GRAM            *
* Recovery          : 1.00000 Carrier Weight : 0.00000                   *
*****
*
*                                     QC DATA                               *
*
* Standard Weight   : 0.00000                                              *
* CALIB. DATE/TIME  : 3-FEB-2010 11:04:32 MS Isotope :                    *
* MSD DPM           : 0.000 MSD Isotope :                                *
* LCS DPM           : 0.000 LCS Isotope :                                *
* LCSD DPM          : 0.000 LCSD Isotope :                                *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act error | MDA<br>(pCi/GRAM ) |           |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.607E+01               | 3.834E+00 | 5.023E-01          | 0.000E+00 |
| CD-109  | 4.723E+00               | 1.143E+00 | 1.364E+00          | 0.000E+00 |
| SN-126  | 4.586E-01               | 1.110E-01 | 1.334E-01          | 0.000E+00 |
| TL-208  | 8.098E-01               | 1.079E-01 | 5.772E-02          | 0.000E+00 |
| BI-211  | 6.499E+00               | 7.668E-01 | 3.375E-01          | 0.000E+00 |
| BI-212  | 2.547E+00               | 9.267E-01 | 7.768E-01          | 0.000E+00 |
| PB-212  | 2.576E+00               | 3.235E-01 | 9.600E-02          | 0.000E+00 |
| BI-214  | 1.887E+00               | 2.387E-01 | 1.085E-01          | 0.000E+00 |
| PB-214  | 2.359E+00               | 3.061E-01 | 1.224E-01          | 0.000E+00 |
| RA-224  | 6.504E+00               | 1.398E+00 | 1.028E+00          | 0.000E+00 |
| RA-226  | 1.887E+00               | 2.387E-01 | 1.085E-01          | 0.000E+00 |
| AC-228  | 2.666E+00               | 4.217E-01 | 2.158E-01          | 0.000E+00 |
| RA-228  | 2.666E+00               | 4.217E-01 | 2.158E-01          | 0.000E+00 |
| TH-228  | 2.576E+00               | 3.235E-01 | 9.600E-02          | 0.000E+00 |
| TH-232  | 2.666E+00               | 4.217E-01 | 2.158E-01          | 0.000E+00 |
| TH-234  | 3.372E+00               | 2.690E+00 | 3.154E+00          | 0.000E+00 |
| U-235   | -1.441E-02              | 2.143E-01 | 3.526E-01          | 0.000E+00 |
| NP-237  | 1.368E+00               | 4.344E-01 | 4.058E-01          | 0.000E+00 |
| U-238   | 3.372E+00               | 2.690E+00 | 3.154E+00          | 0.000E+00 |
| ANH-511 | 2.167E-01               | 6.848E-02 | 4.557E-02          | 0.000E+00 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | 9.714E-02                           | 3.238E-01                | 5.536E-01          | 0.000E+00 NOT IDENT. |
| NA-22   | -4.498E-03                          | 4.493E-02                | 7.365E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 9.204E+07                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| SC-46   | -5.797E-03                          | 3.690E-02                | 6.196E-02          | 0.000E+00 FAIL ABUN  |
| V-48    | -1.591E-02                          | 8.008E-02                | 1.331E-01          | 0.000E+00 NOT IDENT. |
| CR-51   | -1.810E-01                          | 4.049E-01                | 6.879E-01          | 0.000E+00 NOT IDENT. |
| MN-54   | -2.682E-02                          | 3.779E-02                | 6.089E-02          | 0.000E+00 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CO-56   | -2.266E-02 | 3.708E-02 | 6.075E-02 | 0.000E+00 | FAIL ABUN  |
| CO-57   | -2.075E-02 | 2.610E-02 | 4.365E-02 | 0.000E+00 | NOT IDENT. |
| CO-58   | -2.852E-02 | 3.735E-02 | 6.084E-02 | 0.000E+00 | NOT IDENT. |
| FE-59   | -1.679E-02 | 9.883E-02 | 1.633E-01 | 0.000E+00 | NOT IDENT. |
| CO-60   | 2.159E-02  | 3.742E-02 | 6.425E-02 | 0.000E+00 | NOT IDENT. |
| ZN-65   | 7.972E-02  | 9.121E-02 | 1.404E-01 | 0.000E+00 | NOT IDENT. |
| SE-75   | -3.564E-02 | 5.247E-02 | 7.707E-02 | 0.000E+00 | NOT IDENT. |
| SR-85   | 0.000E+00  | 4.642E-02 | 7.551E-02 | 0.000E+00 | NOT IDENT. |
| Y-88    | 1.189E-02  | 3.142E-02 | 5.479E-02 | 0.000E+00 | NOT IDENT. |
| Y-91    | -4.315E+00 | 2.296E+01 | 3.765E+01 | 0.000E+00 | NOT IDENT. |
| NB-94   | 5.245E-03  | 3.267E-02 | 5.667E-02 | 0.000E+00 | NOT IDENT. |
| NB-95   | 0.000E+00  | 5.071E-02 | 8.282E-02 | 0.000E+00 | NOT IDENT. |
| NB-95M  | 0.000E+00  | 1.902E-01 | 2.853E-01 | 0.000E+00 | NOT IDENT. |
| ZR-95   | 1.064E-01  | 7.558E-02 | 1.367E-01 | 0.000E+00 | NOT IDENT. |
| MO-99   | 1.762E+01  | 3.439E+01 | 6.035E+01 | 0.000E+00 | NOT IDENT. |
| TC-99M  | 0.000E+00  | 9.071E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | -2.860E-02 | 4.116E-02 | 6.670E-02 | 0.000E+00 | FAIL ABUN  |
| RH-106  | 1.956E-02  | 3.045E-01 | 5.068E-01 | 0.000E+00 | NOT IDENT. |
| RU-106  | 1.956E-02  | 3.045E-01 | 5.068E-01 | 0.000E+00 | NOT IDENT. |
| AG-108M | -2.832E-02 | 2.931E-02 | 4.755E-02 | 0.000E+00 | NOT IDENT. |
| AG-110M | -1.822E-02 | 3.094E-02 | 5.191E-02 | 0.000E+00 | NOT IDENT. |
| SN-113  | -4.929E-03 | 4.668E-02 | 7.941E-02 | 0.000E+00 | NOT IDENT. |
| CD-115  | 0.000E+00  | 4.336E+01 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| SN-117M | -2.557E-03 | 7.232E-02 | 1.223E-01 | 0.000E+00 | NOT IDENT. |
| TE-123M | 3.952E-03  | 3.068E-02 | 5.208E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | -2.702E-02 | 6.973E-02 | 1.111E-01 | 0.000E+00 | NOT IDENT. |
| SB-125  | 5.749E-02  | 9.073E-02 | 1.578E-01 | 0.000E+00 | FAIL ABUN  |
| TE-125M | 4.083E+00  | 1.059E+01 | 1.837E+01 | 0.000E+00 | NOT IDENT. |
| I-126   | 9.956E-02  | 2.526E-01 | 4.443E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | 2.350E-03  | 1.832E-01 | 2.719E-01 | 0.000E+00 | NOT IDENT. |
| SB-127  | 1.082E-01  | 2.732E+00 | 4.721E+00 | 0.000E+00 | NOT IDENT. |
| I-131   | 1.508E-01  | 1.646E-01 | 2.908E-01 | 0.000E+00 | NOT IDENT. |
| TE-132  | 3.429E-01  | 1.910E+00 | 3.372E+00 | 0.000E+00 | NOT IDENT. |
| BA-133  | 2.246E-02  | 4.359E-02 | 6.662E-02 | 0.000E+00 | FAIL ABUN  |
| I-133   | 0.000E+00  | 1.960E+05 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | 0.000E+00  | 4.972E-02 | 8.916E-02 | 0.000E+00 | NOT IDENT. |
| CS-135  | 0.000E+00  | 1.860E-01 | 2.970E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 4.377E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -1.596E-01 | 1.257E-01 | 1.913E-01 | 0.000E+00 | NOT IDENT. |
| BA-137M | -2.603E-02 | 3.192E-02 | 5.290E-02 | 0.000E+00 | NOT IDENT. |
| CS-137  | -2.750E-02 | 3.372E-02 | 5.588E-02 | 0.000E+00 | NOT IDENT. |
| CE-139  | -1.395E-02 | 3.192E-02 | 5.323E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | 7.466E-02  | 3.132E-01 | 5.292E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | 1.030E-01  | 9.678E-02 | 1.622E-01 | 0.000E+00 | FAIL ABUN  |
| CE-141  | 6.141E-02  | 7.085E-02 | 1.225E-01 | 0.000E+00 | NOT IDENT. |
| CE-143  | 0.000E+00  | 3.731E+03 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CE-144  | -4.119E-01 | 2.189E-01 | 3.385E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | 5.570E-03  | 3.222E-02 | 5.596E-02 | 0.000E+00 | NOT IDENT. |
| PR-144  | 4.686E-01  | 2.414E+00 | 4.196E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | 1.590E-02  | 4.135E-02 | 7.107E-02 | 0.000E+00 | NOT IDENT. |
| ND-147  | 7.386E-01  | 7.079E-01 | 1.232E+00 | 0.000E+00 | FAIL ABUN  |
| PM-149  | 0.000E+00  | 3.521E+02 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| EU-152  | -2.712E-02 | 1.046E-01 | 1.615E-01 | 0.000E+00 | FAIL ABUN  |
| GD-153  | -7.303E-03 | 1.020E-01 | 1.541E-01 | 0.000E+00 | NOT IDENT. |
| EU-154  | 3.427E-02  | 1.234E-01 | 2.073E-01 | 0.000E+00 | NOT IDENT. |
| EU-155  | 2.084E-02  | 1.102E-01 | 1.907E-01 | 0.000E+00 | FAIL ABUN  |
| TB-160  | 8.645E-03  | 1.381E-01 | 2.352E-01 | 0.000E+00 | FAIL ABUN  |
| HO-166M | -2.242E-02 | 5.589E-02 | 9.425E-02 | 0.000E+00 | FAIL ABUN  |
| TA-182  | -1.278E-02 | 2.025E-01 | 3.341E-01 | 0.000E+00 | NOT IDENT. |
| IR-192  | 1.799E-02  | 3.505E-02 | 6.156E-02 | 0.000E+00 | FAIL ABUN  |
| HG-203  | 0.000E+00  | 4.848E-02 | 7.768E-02 | 0.000E+00 | NOT IDENT. |
| BI-207  | 3.415E-02  | 5.239E-02 | 9.084E-02 | 0.000E+00 | FAIL ABUN  |
| PB-210  | -6.887E+00 | 1.025E+01 | 1.707E+01 | 0.000E+00 | NOT IDENT. |
| PB-211  | 1.130E-01  | 7.790E-01 | 1.157E+00 | 0.000E+00 | NOT IDENT. |
| RN-219  | -1.264E-01 | 4.290E-01 | 6.799E-01 | 0.000E+00 | FAIL ABUN  |
| RA-223  | 5.284E-01  | 7.118E-01 | 1.096E+00 | 0.000E+00 | FAIL ABUN  |
| AC-227  | -7.752E-02 | 2.506E-01 | 4.336E-01 | 0.000E+00 | FAIL ABUN  |
| TH-227  | -7.752E-02 | 2.506E-01 | 4.336E-01 | 0.000E+00 | FAIL ABUN  |
| TH-229  | 6.394E-02  | 5.486E-01 | 9.223E-01 | 0.000E+00 | FAIL ABUN  |
| PA-231  | -2.175E-01 | 1.488E+00 | 2.429E+00 | 0.000E+00 | FAIL ABUN  |
| TH-231  | 5.284E-01  | 7.118E-01 | 1.096E+00 | 0.000E+00 | FAIL ABUN  |
| PA-233  | -2.613E-02 | 6.448E-02 | 1.078E-01 | 0.000E+00 | FAIL ABUN  |
| PA-234  | 3.476E-02  | 2.890E-01 | 4.910E-01 | 0.000E+00 | NOT IDENT. |
| PA-234M | 2.690E+00  | 4.823E+00 | 7.785E+00 | 0.000E+00 | FAIL ABUN  |
| NP-239  | 2.658E-01  | 4.108E-01 | 7.146E-01 | 0.000E+00 | FAIL ABUN  |
| AM-241  | 2.955E-01  | 2.662E-01 | 4.242E-01 | 0.000E+00 | NOT IDENT. |
| CM-247  | -4.993E-03 | 4.050E-02 | 6.228E-02 | 0.000E+00 | FAIL ABUN  |
| CF-249  | 6.292E-02  | 4.398E-02 | 7.370E-02 | 0.000E+00 | NOT IDENT. |

|        |           |           |           |                      |
|--------|-----------|-----------|-----------|----------------------|
| CF-251 | 1.099E-01 | 1.427E-01 | 2.345E-01 | 0.000E+00 NOT IDENT. |
|--------|-----------|-----------|-----------|----------------------|



## VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 03:11:08.02

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29414                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964005.CNF;1
Sample date        : 19-FEB-2010 12:00:00 Acquisition date : 10-MAR-2010 23:10:07
Sample ID          : G247964005 Sample quantity      : 1.23990E+02 GRAM
Detector name      : GAM15 Detector geometry: CAN
Elapsed live time  : 0 04:00:00.00 Elapsed real time: 0 04:00:03.08 0.0%
Energy tolerance   : 1.50000 keV Analyst Initials    : MXR1
Abundance limit    : 75.00000 Sensitivity           : 5.00000
Batch ID           : 958216 Detector SN#           :
Matrix Spike ID    : LCS ID                          : 1032-A
*****

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## Nuclide Line Activity Report

## Nuclide Type:

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|-------------------------|------------------------|-------------------|
| K-40    | 1460.82 | 2455  | 10.66* | 9.664E-01 | 3.607E+01               | 3.607E+01              | 10.84             |
| CD-109  | 88.03   | 499   | 3.70*  | 4.455E+00 | 4.586E+00               | 4.723E+00              | 24.69             |
| SN-126  | 64.28   | 150   | 9.60   | 1.816E+00 | 1.300E+00               | 1.300E+00              | 80.73             |
|         | 86.94   | 499   | 8.90   | 4.455E+00 | 1.907E+00               | 1.906E+00              | 47.39             |
|         | 87.57   | 499   | 37.00* | 4.455E+00 | 4.586E-01               | 4.586E-01              | 24.69             |
| TL-208  | 277.37  | 108   | 6.60   | 3.704E+00 | 6.688E-01               | 6.688E-01              | 76.77             |
|         | 583.19  | 996   | 85.00* | 2.191E+00 | 8.098E-01               | 8.098E-01              | 13.60             |
|         | 860.56  | 143   | 12.50  | 1.576E+00 | 1.099E+00               | 1.099E+00              | 52.49             |
| BI-211  | 72.87   | ----- | 1.23   | 3.001E+00 | -----                   | Line Not Found         | -----             |
|         | 351.06  | 1742  | 12.92* | 3.141E+00 | 6.499E+00               | 6.499E+00              | 12.04             |
| BI-212  | 727.33  | 206   | 6.67*  | 1.832E+00 | 2.547E+00               | 2.547E+00              | 37.12             |
|         | 785.37  | 115   | 1.10   | 1.710E+00 | 9.217E+00               | 9.217E+00              | 55.64             |
|         | 1620.50 | ----- | 1.47   | 8.965E-01 | -----                   | Line Not Found         | -----             |
| PB-212  | 74.82   | 877   | 10.28  | 3.260E+00 | 3.962E+00               | 3.962E+00              | 24.77             |
|         | 77.11   | 1332  | 17.10  | 3.502E+00 | 3.367E+00               | 3.367E+00              | 16.26             |
|         | 238.63  | 3053  | 43.60* | 4.115E+00 | 2.576E+00               | 2.576E+00              | 12.82             |
|         | 300.09  | 216   | 3.30   | 3.505E+00 | 2.821E+00               | 2.821E+00              | 47.35             |
| BI-214  | 609.32  | 1201  | 45.49* | 2.118E+00 | 1.887E+00               | 1.887E+00              | 12.91             |
|         | 1120.29 | 226   | 14.92  | 1.227E+00 | 1.866E+00               | 1.866E+00              | 33.83             |
|         | 1764.49 | 211   | 15.30  | 8.555E-01 | 2.446E+00               | 2.446E+00              | 20.99             |
| PB-214  | 74.82   | 877   | 5.80   | 3.260E+00 | 7.022E+00               | 7.022E+00              | 24.12             |
|         | 77.11   | 1332  | 9.70   | 3.502E+00 | 5.935E+00               | 5.935E+00              | 18.23             |
|         | 242.00  | 719   | 7.25   | 4.080E+00 | 3.678E+00               | 3.678E+00              | 22.68             |
|         | 295.22  | 1045  | 18.42  | 3.547E+00 | 2.422E+00               | 2.422E+00              | 15.73             |
|         | 351.93  | 1742  | 35.60* | 3.141E+00 | 2.359E+00               | 2.359E+00              | 13.24             |
| RA-224  | 240.99  | 719   | 4.10*  | 4.080E+00 | 6.504E+00               | 6.504E+00              | 21.93             |
| RA-226  | 609.32  | 1201  | 45.49* | 2.118E+00 | 1.887E+00               | 1.887E+00              | 12.91             |
|         | 1120.29 | 226   | 14.92  | 1.227E+00 | 1.866E+00               | 1.866E+00              | 33.83             |
|         | 1764.49 | 211   | 15.30  | 8.555E-01 | 2.446E+00               | 2.446E+00              | 20.99             |
| AC-228  | 338.32  | 645   | 11.27  | 3.228E+00 | 2.685E+00               | 2.685E+00              | 44.27             |
|         | 911.20  | 679   | 25.80* | 1.494E+00 | 2.666E+00               | 2.666E+00              | 16.14             |
|         | 968.97  | 399   | 15.80  | 1.410E+00 | 2.712E+00               | 2.712E+00              | 28.50             |

Nuclide Type:

| Nuclide | Energy | Area  | %Abn    | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|--------|-------|---------|-----------|-------------------------|------------------------|-------------------|
| RA-228  | 338.32 | 645   | 11.27   | 3.228E+00 | 2.685E+00               | 2.685E+00              | 44.27             |
|         | 911.20 | 679   | 25.80*  | 1.494E+00 | 2.666E+00               | 2.666E+00              | 16.14             |
|         | 968.97 | 399   | 15.80   | 1.410E+00 | 2.712E+00               | 2.712E+00              | 28.50             |
| TH-228  | 74.82  | 877   | 10.28   | 3.260E+00 | 3.962E+00               | 3.962E+00              | 22.80             |
|         | 77.11  | 1332  | 17.10   | 3.502E+00 | 3.367E+00               | 3.367E+00              | 16.26             |
|         | 238.63 | 3053  | 43.60*  | 4.115E+00 | 2.576E+00               | 2.576E+00              | 12.82             |
| TH-232  | 300.09 | 216   | 3.30    | 3.505E+00 | 2.821E+00               | 2.821E+00              | 76.67             |
|         | 338.32 | 645   | 11.27   | 3.228E+00 | 2.685E+00               | 2.685E+00              | 17.15             |
|         | 911.20 | 679   | 25.80*  | 1.494E+00 | 2.666E+00               | 2.666E+00              | 16.14             |
| TH-234  | 968.97 | 399   | 15.80   | 1.410E+00 | 2.712E+00               | 2.712E+00              | 28.50             |
|         | 63.29  | 150   | 3.70*   | 1.816E+00 | 3.372E+00               | 3.372E+00              | 81.39             |
|         | 92.59  | 546   | 4.23    | 4.840E+00 | 4.034E+00               | 4.034E+00              | 34.11             |
| U-235   | 89.96  | 348   | 3.47    | 4.647E+00 | 3.269E+00               | 3.269E+00              | 44.55             |
|         | 93.35  | 546   | 5.60    | 4.840E+00 | 3.047E+00               | 3.047E+00              | 34.78             |
|         | 143.76 | ----- | 10.96*  | 5.506E+00 | -----                   | Line Not Found         | -----             |
| NP-237  | 163.33 | ----- | 5.08    | 5.224E+00 | -----                   | Line Not Found         | -----             |
|         | 185.72 | 557   | 57.20   | 4.856E+00 | 3.036E-01               | 3.036E-01              | 27.97             |
|         | 205.31 | ----- | 5.01    | 4.560E+00 | -----                   | Line Not Found         | -----             |
| U-238   | 86.48  | 499   | 12.40*  | 4.455E+00 | 1.368E+00               | 1.368E+00              | 32.39             |
|         | 95.86  | ----- | 2.68    | 5.004E+00 | -----                   | Line Not Found         | -----             |
|         | 63.29  | 150   | 3.70*   | 1.816E+00 | 3.372E+00               | 3.372E+00              | 81.39             |
| ANH-511 | 92.59  | 546   | 4.23    | 4.840E+00 | 4.034E+00               | 4.034E+00              | 27.39             |
|         | 511.00 | 346   | 100.00* | 2.419E+00 | 2.167E-01               | 2.167E-01              | 32.25             |

Flag: "\*" = Keyline

Total number of lines in spectrum 40  
Number of unidentified lines 7  
Number of lines tentatively identified by NID 33 82.50%

Nuclide Type :

| Nuclide | Hlife     | Decay | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|-------|-------------------------|------------------------|-----------------------------|-------------------|-------|
| K-40    | 1.25E+09Y | 1.00  | 3.607E+01               | 3.607E+01              | 0.391E+01                   | 10.84             |       |
| CD-109  | 461.40D   | 1.03  | 4.586E+00               | 4.723E+00              | 1.166E+00                   | 24.69             |       |
| SN-126  | 2.30E+05Y | 1.00  | 4.586E-01               | 4.586E-01              | 1.132E-01                   | 24.69             |       |
| TL-208  | 1.41E+10Y | 1.00  | 8.098E-01               | 8.098E-01              | 1.101E-01                   | 13.60             |       |
| BI-211  | 7.04E+08Y | 1.00  | 6.499E+00               | 6.499E+00              | 0.782E+00                   | 12.04             |       |
| BI-212  | 1.41E+10Y | 1.00  | 2.547E+00               | 2.547E+00              | 0.946E+00                   | 37.12             |       |
| PB-212  | 1.41E+10Y | 1.00  | 2.576E+00               | 2.576E+00              | 0.330E+00                   | 12.82             |       |
| BI-214  | 1600.00Y  | 1.00  | 1.887E+00               | 1.887E+00              | 0.244E+00                   | 12.91             |       |
| PB-214  | 1600.00Y  | 1.00  | 2.359E+00               | 2.359E+00              | 0.312E+00                   | 13.24             |       |
| RA-224  | 1.41E+10Y | 1.00  | 6.504E+00               | 6.504E+00              | 1.426E+00                   | 21.93             |       |
| RA-226  | 1600.00Y  | 1.00  | 1.887E+00               | 1.887E+00              | 0.244E+00                   | 12.91             |       |
| AC-228  | 1.41E+10Y | 1.00  | 2.666E+00               | 2.666E+00              | 0.430E+00                   | 16.14             |       |
| RA-228  | 1.41E+10Y | 1.00  | 2.666E+00               | 2.666E+00              | 0.430E+00                   | 16.14             |       |
| TH-228  | 1.41E+10Y | 1.00  | 2.576E+00               | 2.576E+00              | 0.330E+00                   | 12.82             |       |
| TH-232  | 1.41E+10Y | 1.00  | 2.666E+00               | 2.666E+00              | 0.430E+00                   | 16.14             |       |
| TH-234  | 4.47E+09Y | 1.00  | 3.372E+00               | 3.372E+00              | 2.745E+00                   | 81.39             |       |
| U-235   | 7.04E+08Y | 1.00  | 3.036E-01               | 3.036E-01              | 0.849E-01                   | 27.97             | K     |
| NP-237  | 2.14E+06Y | 1.00  | 1.368E+00               | 1.368E+00              | 0.443E+00                   | 32.39             |       |
| U-238   | 4.47E+09Y | 1.00  | 3.372E+00               | 3.372E+00              | 2.745E+00                   | 81.39             |       |
| ANH-511 | 1.00E+09Y | 1.00  | 2.167E-01               | 2.167E-01              | 0.699E-01                   | 32.25             |       |

Total Activity : 8.539E+01 8.553E+01

Grand Total Activity : 8.539E+01 8.553E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 209.27  | 265  | 739   | 1.25 | 417.45  | 413  | 10 | 1.84E-02 | 40.4 | 4.50E+00 |       |
| 0  | 270.28  | 211  | 571   | 1.42 | 539.46  | 534  | 11 | 1.46E-02 | 46.0 | 3.77E+00 | T     |
| 0  | 327.69  | 152  | 399   | 1.40 | 654.28  | 650  | 10 | 1.05E-02 | 51.7 | 3.30E+00 | T     |
| 0  | 409.52  | 120  | 289   | 1.62 | 817.94  | 812  | 12 | 8.35E-03 | 60.8 | 2.83E+00 | T     |
| 0  | 462.99  | 143  | 267   | 1.34 | 924.88  | 920  | 10 | 9.94E-03 | 45.9 | 2.60E+00 | T     |
| 0  | 767.87  | 123  | 161   | 1.84 | 1534.69 | 1529 | 11 | 8.54E-03 | 44.0 | 1.75E+00 | T     |
| 1  | 964.30  | 135  | 111   | 2.14 | 1927.60 | 1920 | 26 | 9.38E-03 | 36.0 | 1.42E+00 | T     |
| 0  | 1237.36 | 79   | 168   | 1.82 | 2473.84 | 2468 | 13 | 5.51E-03 | 71.1 | 1.12E+00 | T     |
| 0  | 1377.65 | 66   | 82    | 1.87 | 2754.50 | 2747 | 16 | 4.57E-03 | 66.9 | 1.01E+00 |       |
| 0  | 1408.36 | 69   | 38    | 1.12 | 2815.95 | 2808 | 17 | 4.80E-03 | 47.5 | 9.95E-01 | T     |
| 0  | 1587.74 | 40   | 47    | 1.61 | 3174.83 | 3169 | 13 | 2.78E-03 | 76.6 | 9.09E-01 |       |
| 0  | 1592.99 | 37   | 28    | 0.85 | 3185.33 | 3181 | 12 | 2.54E-03 | 68.2 | 9.07E-01 |       |
| 0  | 1630.21 | 49   | 24    | 1.79 | 3259.80 | 3252 | 17 | 3.38E-03 | 55.3 | 8.93E-01 |       |
| 0  | 1729.45 | 28   | 31    | 2.28 | 3458.37 | 3451 | 14 | 1.93E-03 | 93.7 | 8.64E-01 |       |
| 0  | 1846.73 | 44   | 8     | 2.21 | 3693.01 | 3687 | 11 | 3.03E-03 | 39.6 | 8.40E-01 |       |

Flags: "T" = Tentatively associated

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29414                           *
*****
*                               DETECTOR DATA                               *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247964005.CNF;1
* Acquisition date   : 10-MAR-2010 23:10:07   Detector SN#      :
* Detector ID        : GAM15                   Sensitivity       : 5.00000
* Geometry           : CAN                     Energy tolerance : 1.50000
* Elapsed live time  : 0 04:00:00.00           Abundance limit  : 75.00000
* Elapsed real time  : 0 04:00:03.08           Half life ratio  : 8.00000
*****
*                               SAMPLE DATA                               *
*
* Sample date        : 19-FEB-2010 12:00:00   Nuclide Library : SOLID
* Sample ID          : G247964005             Analyst initials: MXR1
* Batch Number       : 958216                 Sample Quantity : 1.23990E+02 GRAM
*****
*                               QC DATA                               *
*
* CALIB. DATE/TIME   : 3-FEB-2010 11:04:32.11MS Isotope      :
* MSD ID             :                          MSD Isotope   :
* LCS ID             : 1032-A                   LCS Isotope     :
*****

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## Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| K-40    | 3.607E+01              | 3.912E+00 | 5.029E-01         | 4.942E-02 | 71.727  |
| CD-109  | 4.723E+00              | 1.166E+00 | 1.315E+00         | 1.632E-01 | 3.592   |
| SN-126  | 4.586E-01              | 1.132E-01 | 1.287E-01         | 1.592E-02 | 3.565   |
| TL-208  | 8.098E-01              | 1.101E-01 | 5.707E-02         | 5.219E-03 | 14.190  |
| BI-211  | 6.499E+00              | 7.824E-01 | 3.314E-01         | 3.301E-02 | 19.610  |
| BI-212  | 2.547E+00              | 9.456E-01 | 7.703E-01         | 9.571E-02 | 3.307   |
| PB-212  | 2.576E+00              | 3.301E-01 | 9.377E-02         | 1.120E-02 | 27.469  |
| BI-214  | 1.887E+00              | 2.436E-01 | 1.074E-01         | 1.070E-02 | 17.570  |
| PB-214  | 2.359E+00              | 3.123E-01 | 1.202E-01         | 1.366E-02 | 19.624  |
| RA-224  | 6.504E+00              | 1.426E+00 | 1.005E+00         | 1.108E-01 | 6.473   |
| RA-226  | 1.887E+00              | 2.436E-01 | 1.074E-01         | 1.070E-02 | 17.570  |
| AC-228  | 2.666E+00              | 4.303E-01 | 2.146E-01         | 2.600E-02 | 12.419  |
| RA-228  | 2.666E+00              | 4.303E-01 | 2.146E-01         | 2.600E-02 | 12.419  |
| TH-228  | 2.576E+00              | 3.301E-01 | 9.377E-02         | 1.120E-02 | 27.469  |
| TH-232  | 2.666E+00              | 4.303E-01 | 2.146E-01         | 2.600E-02 | 12.419  |
| TH-234  | 3.372E+00              | 2.745E+00 | 3.028E+00         | 6.005E-01 | 1.114   |
| U-235   | 3.036E-01              | 8.493E-02 | 3.422E-01         | 6.088E-02 | 0.887   |
| NP-237  | 1.368E+00              | 4.432E-01 | 3.912E-01         | 9.503E-02 | 3.498   |

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| U-238   | 3.372E+00              | 2.745E+00 | 3.028E+00         | 6.005E-01 | 1.114   |
| ANH-511 | 2.167E-01              | 6.987E-02 | 4.497E-02         | 3.885E-03 | 4.818   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| BE-7    | 9.714E-02                          |              | 3.304E-01 | 5.458E-01         | 5.073E-02 | 0.178   |
| NA-22   | -4.498E-03                         |              | 4.584E-02 | 7.360E-02         | 6.686E-03 | -0.061  |
| NA-24   | 2.318E+01                          |              | 4.696E+01 | Half-Life         | too short |         |
| SC-46   | -5.797E-03                         |              | 3.766E-02 | 6.161E-02         | 5.725E-03 | -0.094  |
| V-48    | -1.591E-02                         |              | 8.171E-02 | 1.325E-01         | 1.211E-02 | -0.120  |
| CR-51   | -1.810E-01                         |              | 4.131E-01 | 6.746E-01         | 7.159E-02 | -0.268  |
| MN-54   | -2.682E-02                         |              | 3.857E-02 | 6.049E-02         | 5.489E-03 | -0.443  |
| CO-56   | -2.266E-02                         |              | 3.784E-02 | 6.036E-02         | 5.508E-03 | -0.375  |
| CO-57   | -2.075E-02                         |              | 2.663E-02 | 4.226E-02         | 4.257E-03 | -0.491  |
| CO-58   | -2.852E-02                         |              | 3.811E-02 | 6.042E-02         | 5.432E-03 | -0.472  |
| FE-59   | -1.679E-02                         |              | 1.008E-01 | 1.628E-01         | 1.519E-02 | -0.103  |
| CO-60   | 2.159E-02                          |              | 3.818E-02 | 6.424E-02         | 6.176E-03 | 0.336   |
| ZN-65   | 7.972E-02                          |              | 9.307E-02 | 1.401E-01         | 1.197E-02 | 0.569   |
| SE-75   | -3.564E-02                         |              | 5.354E-02 | 7.539E-02         | 8.267E-03 | -0.473  |
| SR-85   | 1.223E-01                          |              | 4.737E-02 | 7.452E-02         | 6.438E-03 | 1.641   |
| Y-88    | 1.189E-02                          |              | 3.206E-02 | 5.503E-02         | 4.635E-03 | 0.216   |
| Y-91    | -4.315E+00                         |              | 2.343E+01 | 3.759E+01         | 3.169E+00 | -0.115  |
| NB-94   | 5.245E-03                          |              | 3.334E-02 | 5.616E-02         | 4.742E-03 | 0.093   |
| NB-95   | 1.049E-01                          |              | 5.174E-02 | 8.218E-02         | 7.200E-03 | 1.277   |
| NB-95M  | 8.735E-01                          |              | 1.941E-01 | 2.787E-01         | 3.358E-02 | 3.134   |
| ZR-95   | 1.064E-01                          |              | 7.712E-02 | 1.357E-01         | 1.304E-02 | 0.784   |
| MO-99   | 1.762E+01                          |              | 3.509E+01 | 5.986E+01         | 9.437E+00 | 0.294   |
| TC-99M  | -1.390E+16                         |              | 4.628E+15 | Half-Life         | too short |         |
| RU-103  | -2.860E-02                         |              | 4.200E-02 | 6.580E-02         | 9.198E-03 | -0.435  |
| RH-106  | 1.956E-02                          |              | 3.107E-01 | 5.015E-01         | 6.577E-02 | 0.039   |
| RU-106  | 1.956E-02                          |              | 3.107E-01 | 5.015E-01         | 4.214E-02 | 0.039   |
| AG-108M | -2.832E-02                         |              | 2.990E-02 | 4.683E-02         | 4.138E-03 | -0.605  |
| AG-110M | -1.822E-02                         |              | 3.158E-02 | 5.140E-02         | 4.374E-03 | -0.354  |
| SN-113  | -4.929E-03                         |              | 4.764E-02 | 7.809E-02         | 6.782E-03 | -0.063  |
| CD-115  | 9.989E-06                          |              | 2.212E-05 | Half-Life         | too short |         |
| SN-117M | -2.557E-03                         |              | 7.380E-02 | 1.188E-01         | 1.246E-02 | -0.022  |
| TE-123M | 3.952E-03                          |              | 3.130E-02 | 5.060E-02         | 5.332E-03 | 0.078   |
| SB-124  | -2.702E-02                         |              | 7.116E-02 | 1.115E-01         | 1.050E-02 | -0.242  |
| SB-125  | 5.749E-02                          |              | 9.258E-02 | 1.553E-01         | 1.352E-02 | 0.370   |
| TE-125M | 4.083E+00                          |              | 1.080E+01 | 1.776E+01         | 2.111E+00 | 0.230   |
| I-126   | 9.956E-02                          |              | 2.577E-01 | 4.400E-01         | 3.629E-02 | 0.226   |
| SB-126  | 2.350E-03                          |              | 1.870E-01 | 2.696E-01         | 2.301E-02 | 0.009   |
| SB-127  | 1.082E-01                          |              | 2.788E+00 | 4.678E+00         | 5.881E-01 | 0.023   |
| I-131   | 1.508E-01                          |              | 1.679E-01 | 2.856E-01         | 2.766E-02 | 0.528   |
| TE-132  | 3.429E-01                          |              | 1.949E+00 | 3.292E+00         | 5.968E-01 | 0.104   |
| BA-133  | 2.246E-02                          |              | 4.448E-02 | 6.543E-02         | 8.840E-03 | 0.343   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| I-133   | 1.732E-01                          |              | 9.999E-02 | Half-Life too short |           |         |
| CS-134  | 1.210E-01                          |              | 5.073E-02 | 8.852E-02           | 7.934E-03 | 1.366   |
| CS-135  | 3.962E-01                          |              | 1.898E-01 | 2.905E-01           | 3.486E-02 | 1.364   |
| I-135   | -1.267E+14                         |              | 2.233E+14 | Half-Life too short |           |         |
| CS-136  | -1.596E-01                         |              | 1.282E-01 | 1.907E-01           | 1.764E-02 | -0.837  |
| BA-137M | -2.603E-02                         |              | 3.257E-02 | 5.239E-02           | 4.307E-03 | -0.497  |
| CS-137  | -2.750E-02                         |              | 3.440E-02 | 5.534E-02           | 4.559E-03 | -0.497  |
| CE-139  | -1.395E-02                         |              | 3.257E-02 | 5.174E-02           | 5.524E-03 | -0.270  |
| BA-140  | 7.466E-02                          |              | 3.196E-01 | 5.226E-01           | 1.773E-01 | 0.143   |
| LA-140  | 1.030E-01                          |              | 9.876E-02 | 1.626E-01           | 1.524E-02 | 0.633   |
| CE-141  | 6.141E-02                          |              | 7.229E-02 | 1.189E-01           | 1.229E-02 | 0.516   |
| CE-143  | 1.405E-02                          |              | 1.904E-03 | Half-Life too short |           |         |
| CE-144  | -4.119E-01                         |              | 2.233E-01 | 3.281E-01           | 5.295E-02 | -1.255  |
| PM-144  | 5.570E-03                          |              | 3.287E-02 | 5.545E-02           | 4.666E-03 | 0.100   |
| PR-144  | 4.686E-01                          |              | 2.463E+00 | 4.158E+00           | 3.497E-01 | 0.113   |
| PM-146  | 1.590E-02                          |              | 4.219E-02 | 7.002E-02           | 7.405E-03 | 0.227   |
| ND-147  | 7.386E-01                          |              | 7.224E-01 | 1.216E+00           | 1.819E-01 | 0.607   |
| PM-149  | 1.153E-07                          |              | 1.796E-04 | Half-Life too short |           |         |
| EU-152  | -2.712E-02                         |              | 1.068E-01 | 1.586E-01           | 1.614E-02 | -0.171  |
| GD-153  | -7.303E-03                         |              | 1.040E-01 | 1.487E-01           | 1.641E-02 | -0.049  |
| EU-154  | 3.427E-02                          |              | 1.259E-01 | 2.071E-01           | 2.429E-02 | 0.165   |
| EU-155  | 2.084E-02                          |              | 1.124E-01 | 1.843E-01           | 1.941E-02 | 0.113   |
| TB-160  | 8.645E-03                          |              | 1.410E-01 | 2.338E-01           | 2.164E-02 | 0.037   |
| HO-166M | -2.242E-02                         |              | 5.703E-02 | 9.343E-02           | 7.932E-03 | -0.240  |
| TA-182  | -1.278E-02                         |              | 2.066E-01 | 3.336E-01           | 2.864E-02 | -0.038  |
| IR-192  | 1.799E-02                          |              | 3.577E-02 | 6.036E-02           | 6.224E-03 | 0.298   |
| HG-203  | 9.882E-02                          |              | 4.947E-02 | 7.604E-02           | 8.356E-03 | 1.300   |
| BI-207  | 3.415E-02                          |              | 5.346E-02 | 9.055E-02           | 7.989E-03 | 0.377   |
| PB-210  | -6.887E+00                         |              | 1.045E+01 | 1.633E+01           | 2.010E+00 | -0.422  |
| PB-211  | 1.130E-01                          |              | 7.949E-01 | 1.138E+00           | 5.503E-01 | 0.099   |
| RN-219  | -1.264E-01                         |              | 4.378E-01 | 6.688E-01           | 9.884E-02 | -0.189  |
| RA-223  | 5.284E-01                          |              | 7.263E-01 | 1.075E+00           | 1.951E-01 | 0.492   |
| AC-227  | -7.752E-02                         |              | 2.557E-01 | 4.240E-01           | 5.867E-02 | -0.183  |
| TH-227  | -7.752E-02                         |              | 2.557E-01 | 4.240E-01           | 6.449E-02 | -0.183  |
| TH-229  | 6.394E-02                          |              | 5.598E-01 | 8.985E-01           | 9.775E-02 | 0.071   |
| PA-231  | -2.175E-01                         |              | 1.518E+00 | 2.378E+00           | 3.792E-01 | -0.091  |
| TH-231  | 5.284E-01                          |              | 7.263E-01 | 1.075E+00           | 1.951E-01 | 0.492   |
| PA-233  | -2.613E-02                         |              | 6.579E-02 | 1.056E-01           | 1.118E-02 | -0.247  |
| PA-234  | 3.476E-02                          |              | 2.949E-01 | 4.887E-01           | 9.313E-02 | 0.071   |
| PA-234M | 2.690E+00                          |              | 4.921E+00 | 7.754E+00           | 8.040E-01 | 0.347   |
| NP-239  | 2.658E-01                          |              | 4.191E-01 | 6.915E-01           | 6.979E-02 | 0.384   |
| AM-241  | 2.955E-01                          |              | 2.717E-01 | 4.069E-01           | 4.777E-02 | 0.726   |
| CM-247  | -4.993E-03                         |              | 4.133E-02 | 6.127E-02           | 5.181E-03 | -0.082  |
| CF-249  | 6.292E-02                          |              | 4.488E-02 | 7.246E-02           | 6.176E-03 | 0.868   |
| CF-251  | 1.099E-01                          |              | 1.456E-01 | 2.282E-01           | 2.456E-02 | 0.482   |

# VAX/VMS Nuclide Identification Report Generated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*                                     DETECTOR DATA                          *
*
* Configuration      : SYSSYSROOT:[ALPHA.ARCHIVE.GAMMA]G247964005           *
* Acquisition date   : 10-MAR-2010 23:10:07 Detector SN#      :             *
* Detector ID        : GAM15 Sensitivity      : 5.000           *
* Geometry           : CAN Energy tolerance: 1.500           *
* Elapsed live time  : 0 04:00:00.00 Abundance limit : 75.000  *
* Elapsed real time  : 0 04:00:03.08 Half life ratio : 8.000   *
*****
*                                     SAMPLE DATA                          *
*
* Sample date        : 19-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID          : G247964005 Analyst initials: MXR1         *
* Batch Number       : 958216 Sample Quantity : 1.2399E+02 GRAM *
* Recovery           : 1.00000 Carrier Weight  : 0.00000        *
*****
*                                     QC DATA                             *
*
* CALIB. DATE/TIME  : 3-FEB-2010 11:04:32 MS Isotope          :             *
* MSD DPM            : 0.000 MSD Isotope                       :             *
* LCS DPM            : 0.000 LCS Isotope                       :             *
* LCSD DPM           : 0.000 LCSD Isotope                     :             *
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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act Error | DLC<br>(pCi/GRAM ) | TPU       |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.607E+01               | 3.834E+00 | 2.513E-01          | 1.956E+00 |
| CD-109  | 4.723E+00               | 1.143E+00 | 6.823E-01          | 5.830E-01 |
| SN-126  | 4.586E-01               | 1.110E-01 | 6.676E-02          | 5.661E-02 |
| TL-208  | 8.098E-01               | 1.079E-01 | 2.888E-02          | 5.505E-02 |
| BI-211  | 6.499E+00               | 7.668E-01 | 1.689E-01          | 3.912E-01 |
| BI-212  | 2.547E+00               | 9.267E-01 | 3.886E-01          | 4.728E-01 |
| PB-212  | 2.576E+00               | 3.235E-01 | 4.803E-02          | 1.651E-01 |
| BI-214  | 1.887E+00               | 2.387E-01 | 5.431E-02          | 1.218E-01 |
| PB-214  | 2.359E+00               | 3.061E-01 | 6.124E-02          | 1.562E-01 |
| RA-224  | 6.504E+00               | 1.398E+00 | 5.146E-01          | 7.131E-01 |
| RA-226  | 1.887E+00               | 2.387E-01 | 5.431E-02          | 1.218E-01 |
| AC-228  | 2.666E+00               | 4.217E-01 | 1.080E-01          | 2.151E-01 |
| RA-228  | 2.666E+00               | 4.217E-01 | 1.080E-01          | 2.151E-01 |
| TH-228  | 2.576E+00               | 3.235E-01 | 4.803E-02          | 1.651E-01 |
| TH-232  | 2.666E+00               | 4.217E-01 | 1.080E-01          | 2.151E-01 |
| TH-234  | 3.372E+00               | 2.690E+00 | 1.578E+00          | 1.372E+00 |
| U-235   | -1.441E-02              | 2.143E-01 | 1.764E-01          | 1.093E-01 |
| NP-237  | 1.368E+00               | 4.344E-01 | 2.030E-01          | 2.216E-01 |
| U-238   | 3.372E+00               | 2.690E+00 | 1.578E+00          | 1.372E+00 |
| ANH-511 | 2.167E-01               | 6.848E-02 | 2.280E-02          | 3.494E-02 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act error | DLC<br>(pCi/GRAM ) | TPU                  |
|---------|-------------------------------------|---------------|--------------------|----------------------|
| BE-7    | 9.714E-02                           | 3.238E-01     | 2.769E-01          | 1.652E-01 NOT IDENT. |
| NA-22   | -4.498E-03                          | 4.493E-02     | 3.685E-02          | 2.292E-02 NOT IDENT. |
| NA-24   | 2.318E+07                           | 9.204E+07     | 0.000E+00          | 4.696E+07 SHORT HLIF |
| SC-46   | -5.797E-03                          | 3.690E-02     | 3.100E-02          | 1.883E-02 FAIL ABUN  |
| V-48    | -1.591E-02                          | 8.008E-02     | 6.658E-02          | 4.085E-02 NOT IDENT. |
| CR-51   | -1.810E-01                          | 4.049E-01     | 3.442E-01          | 2.066E-01 NOT IDENT. |
| MN-54   | -2.682E-02                          | 3.779E-02     | 3.046E-02          | 1.928E-02 NOT IDENT. |



|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CO-56   | -2.266E-02 | 3.708E-02 | 3.039E-02 | 1.892E-02 | FAIL ABUN  |
| CO-57   | -2.075E-02 | 2.610E-02 | 2.184E-02 | 1.332E-02 | NOT IDENT. |
| CO-58   | -2.852E-02 | 3.735E-02 | 3.044E-02 | 1.906E-02 | NOT IDENT. |
| FE-59   | -1.679E-02 | 9.883E-02 | 8.169E-02 | 5.042E-02 | NOT IDENT. |
| CO-60   | 2.159E-02  | 3.742E-02 | 3.214E-02 | 1.909E-02 | NOT IDENT. |
| ZN-65   | 7.972E-02  | 9.121E-02 | 7.025E-02 | 4.654E-02 | NOT IDENT. |
| SE-75   | -3.564E-02 | 5.247E-02 | 3.856E-02 | 2.677E-02 | NOT IDENT. |
| SR-85   | 1.223E-01  | 4.642E-02 | 3.778E-02 | 2.368E-02 | NOT IDENT. |
| Y-88    | 1.189E-02  | 3.142E-02 | 2.741E-02 | 1.603E-02 | NOT IDENT. |
| Y-91    | -4.315E+00 | 2.296E+01 | 1.883E+01 | 1.172E+01 | NOT IDENT. |
| NB-94   | 5.245E-03  | 3.267E-02 | 2.835E-02 | 1.667E-02 | NOT IDENT. |
| NB-95   | 1.049E-01  | 5.071E-02 | 4.143E-02 | 2.587E-02 | NOT IDENT. |
| NB-95M  | 8.735E-01  | 1.902E-01 | 1.428E-01 | 9.706E-02 | NOT IDENT. |
| ZR-95   | 1.064E-01  | 7.558E-02 | 6.841E-02 | 3.856E-02 | NOT IDENT. |
| MO-99   | 1.762E+01  | 3.439E+01 | 3.020E+01 | 1.754E+01 | NOT IDENT. |
| TC-99M  | -1.390E+22 | 9.071E+21 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | -2.860E-02 | 4.116E-02 | 3.337E-02 | 2.100E-02 | FAIL ABUN  |
| RH-106  | 1.956E-02  | 3.045E-01 | 2.535E-01 | 1.554E-01 | NOT IDENT. |
| RU-106  | 1.956E-02  | 3.045E-01 | 2.535E-01 | 1.554E-01 | NOT IDENT. |
| AG-108M | -2.832E-02 | 2.931E-02 | 2.379E-02 | 1.495E-02 | NOT IDENT. |
| AG-110M | -1.822E-02 | 3.094E-02 | 2.597E-02 | 1.579E-02 | NOT IDENT. |
| SN-113  | -4.929E-03 | 4.668E-02 | 3.973E-02 | 2.382E-02 | NOT IDENT. |
| CD-115  | 9.989E+00  | 4.336E+01 | 0.000E+00 | 2.212E+01 | SHORT HLIF |
| SN-117M | -2.557E-03 | 7.232E-02 | 6.118E-02 | 3.690E-02 | NOT IDENT. |
| TE-123M | 3.952E-03  | 3.068E-02 | 2.605E-02 | 1.565E-02 | NOT IDENT. |
| SB-124  | -2.702E-02 | 6.973E-02 | 5.560E-02 | 3.558E-02 | NOT IDENT. |
| SB-125  | 5.749E-02  | 9.073E-02 | 7.894E-02 | 4.629E-02 | FAIL ABUN  |
| TE-125M | 4.083E+00  | 1.059E+01 | 9.189E+00 | 5.401E+00 | NOT IDENT. |
| I-126   | 9.956E-02  | 2.526E-01 | 2.223E-01 | 1.289E-01 | NOT IDENT. |
| SB-126  | 2.350E-03  | 1.832E-01 | 1.360E-01 | 9.349E-02 | NOT IDENT. |
| SB-127  | 1.082E-01  | 2.732E+00 | 2.362E+00 | 1.394E+00 | NOT IDENT. |
| I-131   | 1.508E-01  | 1.646E-01 | 1.455E-01 | 8.397E-02 | NOT IDENT. |
| TE-132  | 3.429E-01  | 1.910E+00 | 1.687E+00 | 9.747E-01 | NOT IDENT. |
| BA-133  | 2.246E-02  | 4.359E-02 | 3.333E-02 | 2.224E-02 | FAIL ABUN  |
| I-133   | 1.732E+05  | 1.960E+05 | 0.000E+00 | 9.999E+04 | SHORT HLIF |
| CS-134  | 1.210E-01  | 4.972E-02 | 4.461E-02 | 2.537E-02 | NOT IDENT. |
| CS-135  | 3.962E-01  | 1.860E-01 | 1.486E-01 | 9.491E-02 | NOT IDENT. |
| I-135   | -1.267E+20 | 4.377E+20 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -1.596E-01 | 1.257E-01 | 9.572E-02 | 6.411E-02 | NOT IDENT. |
| BA-137M | -2.603E-02 | 3.192E-02 | 2.647E-02 | 1.628E-02 | NOT IDENT. |
| CS-137  | -2.750E-02 | 3.372E-02 | 2.796E-02 | 1.720E-02 | NOT IDENT. |
| CE-139  | -1.395E-02 | 3.192E-02 | 2.663E-02 | 1.629E-02 | NOT IDENT. |
| BA-140  | 7.466E-02  | 3.132E-01 | 2.648E-01 | 1.598E-01 | NOT IDENT. |
| LA-140  | 1.030E-01  | 9.678E-02 | 8.115E-02 | 4.938E-02 | FAIL ABUN  |
| CE-141  | 6.141E-02  | 7.085E-02 | 6.130E-02 | 3.615E-02 | NOT IDENT. |
| CE-143  | 1.405E+04  | 3.731E+03 | 0.000E+00 | 1.904E+03 | SHORT HLIF |
| CE-144  | -4.119E-01 | 2.189E-01 | 1.693E-01 | 1.117E-01 | NOT IDENT. |
| PM-144  | 5.570E-03  | 3.222E-02 | 2.799E-02 | 1.644E-02 | NOT IDENT. |
| PR-144  | 4.686E-01  | 2.414E+00 | 2.099E+00 | 1.231E+00 | NOT IDENT. |
| PM-146  | 1.590E-02  | 4.135E-02 | 3.556E-02 | 2.110E-02 | NOT IDENT. |
| ND-147  | 7.386E-01  | 7.079E-01 | 6.162E-01 | 3.612E-01 | FAIL ABUN  |
| PM-149  | 1.153E-01  | 3.521E+02 | 0.000E+00 | 1.796E+02 | SHORT HLIF |
| EU-152  | -2.712E-02 | 1.046E-01 | 8.082E-02 | 5.338E-02 | FAIL ABUN  |
| GD-153  | -7.303E-03 | 1.020E-01 | 7.707E-02 | 5.202E-02 | NOT IDENT. |
| EU-154  | 3.427E-02  | 1.234E-01 | 1.037E-01 | 6.297E-02 | NOT IDENT. |
| EU-155  | 2.084E-02  | 1.102E-01 | 9.539E-02 | 5.620E-02 | FAIL ABUN  |
| TB-160  | 8.645E-03  | 1.381E-01 | 1.177E-01 | 7.048E-02 | FAIL ABUN  |
| HO-166M | -2.242E-02 | 5.589E-02 | 4.715E-02 | 2.851E-02 | FAIL ABUN  |
| TA-182  | -1.278E-02 | 2.025E-01 | 1.671E-01 | 1.033E-01 | NOT IDENT. |
| IR-192  | 1.799E-02  | 3.505E-02 | 3.080E-02 | 1.788E-02 | FAIL ABUN  |
| HG-203  | 9.882E-02  | 4.848E-02 | 3.886E-02 | 2.473E-02 | NOT IDENT. |
| BI-207  | 3.415E-02  | 5.239E-02 | 4.545E-02 | 2.673E-02 | FAIL ABUN  |
| PB-210  | -6.887E+00 | 1.025E+01 | 8.542E+00 | 5.227E+00 | NOT IDENT. |
| PB-211  | 1.130E-01  | 7.790E-01 | 5.787E-01 | 3.975E-01 | NOT IDENT. |
| RN-219  | -1.264E-01 | 4.290E-01 | 3.402E-01 | 2.189E-01 | FAIL ABUN  |
| RA-223  | 5.284E-01  | 7.118E-01 | 5.483E-01 | 3.632E-01 | FAIL ABUN  |
| AC-227  | -7.752E-02 | 2.506E-01 | 2.169E-01 | 1.278E-01 | FAIL ABUN  |
| TH-227  | -7.752E-02 | 2.506E-01 | 2.169E-01 | 1.279E-01 | FAIL ABUN  |
| TH-229  | 6.394E-02  | 5.486E-01 | 4.614E-01 | 2.799E-01 | FAIL ABUN  |
| PA-231  | -2.175E-01 | 1.488E+00 | 1.215E+00 | 7.591E-01 | FAIL ABUN  |
| TH-231  | 5.284E-01  | 7.118E-01 | 5.483E-01 | 3.632E-01 | FAIL ABUN  |
| PA-233  | -2.613E-02 | 6.448E-02 | 5.392E-02 | 3.290E-02 | FAIL ABUN  |
| PA-234  | 3.476E-02  | 2.890E-01 | 2.457E-01 | 1.475E-01 | NOT IDENT. |
| PA-234M | 2.690E+00  | 4.823E+00 | 3.895E+00 | 2.460E+00 | FAIL ABUN  |
| NP-239  | 2.658E-01  | 4.108E-01 | 3.575E-01 | 2.096E-01 | FAIL ABUN  |
| AM-241  | 2.955E-01  | 2.662E-01 | 2.122E-01 | 1.358E-01 | NOT IDENT. |
| CM-247  | -4.993E-03 | 4.050E-02 | 3.116E-02 | 2.067E-02 | FAIL ABUN  |
| CF-249  | 6.292E-02  | 4.398E-02 | 3.687E-02 | 2.244E-02 | NOT IDENT. |

|        |           |           |           |                      |
|--------|-----------|-----------|-----------|----------------------|
| CF-251 | 1.099E-01 | 1.427E-01 | 1.173E-01 | 7.278E-02 NOT IDENT. |
|--------|-----------|-----------|-----------|----------------------|

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 SAVAGE ROAD                        *
*                                     CHARLESTON ,SC 29417                     *
*                                     GAMMA SPECTROSCOPY BACKGROUND REPORT      *
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| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 691.5505   |
| 49.72  | 718.2792   |
| 57.36  | 0.0000     |
| 59.54  | 713.4629   |
| 63.29  | 838.1893   |
| 63.29  | 838.1893   |
| 64.28  | 845.2637   |
| 67.75  | 1027.7200  |
| 69.67  | 911.6483   |
| 70.83  | 924.1529   |
| 72.81  | 1036.1897  |
| 72.87  | 1036.2716  |
| 72.87  | 1036.2716  |
| 74.82  | 1038.9607  |
| 74.82  | 1038.9607  |
| 74.82  | 1038.9607  |
| 74.97  | 1039.1683  |
| 77.11  | 1042.0750  |
| 77.11  | 1042.0750  |
| 77.11  | 1042.0750  |
| 79.69  | 1078.8258  |
| 79.80  | 1015.0388  |
| 80.12  | 1015.4496  |
| 80.19  | 1015.5388  |
| 80.57  | 1016.0272  |
| 81.00  | 1016.5775  |
| 81.07  | 1016.6666  |
| 81.07  | 1016.6666  |
| 83.79  | 1020.1160  |
| 83.79  | 1020.1160  |
| 85.43  | 909.4866   |
| 86.48  | 910.6453   |
| 86.55  | 910.7245   |
| 86.79  | 910.9832   |
| 86.94  | 911.1522   |
| 87.57  | 911.8419   |
| 88.03  | 912.3453   |
| 88.47  | 912.8247   |
| 89.96  | 914.4386   |
| 91.11  | 915.6766   |
| 92.59  | 917.2560   |
| 92.59  | 917.2560   |
| 93.35  | 918.0629   |
| 94.67  | 919.4596   |
| 94.87  | 921.2976   |
| 94.87  | 921.2976   |
| 95.86  | 1000.5569  |
| 97.43  | 873.3686   |
| 98.44  | 830.2315   |
| 99.53  | 805.0584   |
| 100.11 | 795.4779   |
| 103.18 | 950.8081   |
| 103.37 | 870.8996   |
| 105.31 | 856.2576   |
| 106.12 | 853.9085   |
| 109.28 | 840.2330   |
| 111.00 | 839.6695   |
| 111.76 | 871.4166   |
| 116.30 | 763.0393   |
| 117.23 | 787.7202   |
| 121.12 | 812.7343   |
| 121.78 | 832.1019   |
| 122.06 | 821.8627   |
| 123.07 | 803.8075   |
| 131.20 | 852.3211   |
| 133.52 | 925.0776   |
| 136.00 | 799.8882   |

|        |          |
|--------|----------|
| 136.47 | 772.6391 |
| 140.51 | 938.4419 |
| 140.51 | 0.0000   |
| 143.76 | 821.5156 |
| 144.24 | 818.6555 |
| 144.24 | 818.6555 |
| 145.44 | 799.1929 |
| 152.43 | 786.8210 |
| 153.25 | 834.7605 |
| 154.21 | 848.3763 |
| 154.21 | 848.3763 |
| 156.02 | 793.5322 |
| 158.56 | 816.8587 |
| 159.00 | 803.0823 |
| 162.66 | 807.6821 |
| 163.33 | 776.6253 |
| 165.86 | 797.8097 |
| 176.60 | 716.8094 |
| 177.52 | 705.2341 |
| 181.07 | 798.3682 |
| 184.41 | 706.7529 |
| 185.72 | 719.6105 |
| 193.51 | 702.6535 |
| 197.04 | 705.5764 |
| 205.31 | 753.4878 |
| 210.85 | 639.3467 |
| 215.65 | 656.1428 |
| 222.11 | 666.9551 |
| 227.38 | 644.7104 |
| 228.16 | 628.6437 |
| 228.18 | 628.6522 |
| 235.69 | 607.3201 |
| 235.96 | 607.4254 |
| 235.96 | 607.4254 |
| 238.63 | 571.4686 |
| 238.63 | 571.4686 |
| 240.99 | 572.3280 |
| 242.00 | 572.6968 |
| 244.70 | 527.9398 |
| 252.40 | 510.7381 |
| 252.80 | 511.7883 |
| 256.23 | 521.2135 |
| 256.23 | 521.2135 |
| 260.90 | 0.0000   |
| 264.66 | 512.6843 |
| 268.22 | 468.6223 |
| 269.46 | 468.9653 |
| 269.46 | 468.9653 |
| 271.23 | 491.2903 |
| 273.65 | 529.4737 |
| 276.40 | 509.9852 |
| 277.37 | 474.7915 |
| 277.60 | 476.9467 |
| 278.00 | 475.3818 |
| 279.20 | 443.4369 |
| 279.54 | 443.5233 |
| 280.46 | 448.4635 |
| 283.69 | 447.7188 |
| 284.31 | 457.8341 |
| 285.41 | 456.6509 |
| 285.90 | 0.0000   |
| 287.50 | 441.8707 |
| 293.27 | 0.0000   |
| 295.22 | 433.5587 |
| 295.96 | 433.7372 |
| 298.57 | 434.3676 |
| 299.98 | 434.7023 |
| 299.98 | 434.7023 |
| 300.09 | 434.7302 |
| 300.09 | 434.7302 |
| 300.13 | 434.7413 |
| 301.36 | 414.0890 |
| 302.85 | 427.1316 |
| 304.50 | 408.4434 |
| 304.50 | 408.4434 |
| 304.85 | 408.5219 |
| 308.46 | 387.9798 |
| 311.90 | 395.4001 |

|        |          |
|--------|----------|
| 316.51 | 370.4601 |
| 319.41 | 414.2851 |
| 320.08 | 405.7732 |
| 323.87 | 364.5107 |
| 323.87 | 364.5107 |
| 328.76 | 439.4927 |
| 333.37 | 382.4441 |
| 334.37 | 411.7032 |
| 334.37 | 411.7032 |
| 338.28 | 388.2568 |
| 338.28 | 388.2568 |
| 338.32 | 388.2666 |
| 338.32 | 388.2666 |
| 338.32 | 388.2666 |
| 340.48 | 369.2568 |
| 340.55 | 369.2684 |
| 344.28 | 378.3069 |
| 351.06 | 366.3300 |
| 351.93 | 364.5310 |
| 356.01 | 292.1460 |
| 364.49 | 305.8103 |
| 366.42 | 347.4326 |
| 383.85 | 336.4178 |
| 388.16 | 310.2442 |
| 388.63 | 343.1301 |
| 391.69 | 354.5703 |
| 400.66 | 326.0239 |
| 401.81 | 338.9485 |
| 402.40 | 328.8522 |
| 404.85 | 295.5798 |
| 410.95 | 281.3159 |
| 414.70 | 315.3299 |
| 423.72 | 312.2024 |
| 427.09 | 289.3865 |
| 427.87 | 286.4477 |
| 433.94 | 313.5829 |
| 453.88 | 268.1342 |
| 463.37 | 279.1183 |
| 468.07 | 238.4764 |
| 473.00 | 250.6442 |
| 476.78 | 245.8617 |
| 477.60 | 240.7733 |
| 487.02 | 243.7551 |
| 492.35 | 0.0000   |
| 497.08 | 250.9671 |
| 511.00 | 238.7112 |
| 514.00 | 242.8272 |
| 527.90 | 0.0000   |
| 529.87 | 0.0000   |
| 531.02 | 196.2173 |
| 537.26 | 203.0156 |
| 546.56 | 0.0000   |
| 563.25 | 218.8185 |
| 569.33 | 223.5728 |
| 569.50 | 209.6808 |
| 569.70 | 213.9746 |
| 583.19 | 227.8897 |
| 600.60 | 242.7244 |
| 602.73 | 209.2305 |
| 604.72 | 207.5671 |
| 609.32 | 215.8441 |
| 609.32 | 215.8441 |
| 610.33 | 222.4320 |
| 614.28 | 237.2136 |
| 618.01 | 204.2725 |
| 621.93 | 199.3342 |
| 621.93 | 199.3342 |
| 633.25 | 213.2051 |
| 635.95 | 195.8818 |
| 636.99 | 206.8987 |
| 645.85 | 234.9454 |
| 657.76 | 190.1122 |
| 661.66 | 205.9805 |
| 661.66 | 205.9805 |
| 664.57 | 0.0000   |
| 666.33 | 186.9465 |
| 666.50 | 186.9589 |
| 677.62 | 196.8577 |

|         |          |
|---------|----------|
| 685.70  | 192.7233 |
| 695.00  | 196.0653 |
| 696.49  | 198.9444 |
| 696.51  | 198.0148 |
| 697.00  | 198.9749 |
| 702.65  | 218.8782 |
| 706.68  | 214.4879 |
| 711.68  | 194.2637 |
| 720.70  | 160.5469 |
| 721.93  | 0.0000   |
| 722.78  | 162.2510 |
| 722.91  | 162.2580 |
| 723.31  | 175.1329 |
| 724.19  | 162.3214 |
| 727.33  | 178.5593 |
| 733.00  | 146.6340 |
| 735.93  | 190.9774 |
| 739.50  | 161.9849 |
| 747.24  | 176.5109 |
| 752.31  | 198.5156 |
| 753.82  | 161.7180 |
| 756.73  | 170.3760 |
| 763.94  | 156.0971 |
| 765.81  | 167.5690 |
| 766.42  | 165.9706 |
| 777.92  | 192.9976 |
| 778.90  | 167.1735 |
| 783.70  | 176.5999 |
| 785.37  | 166.8671 |
| 795.86  | 156.2041 |
| 801.95  | 167.7831 |
| 810.29  | 157.6004 |
| 810.76  | 163.3871 |
| 815.77  | 146.2883 |
| 818.51  | 148.3259 |
| 832.01  | 174.0051 |
| 834.85  | 196.3878 |
| 836.80  | 0.0000   |
| 846.77  | 152.3748 |
| 856.80  | 150.1423 |
| 860.56  | 128.5813 |
| 871.09  | 133.8225 |
| 873.19  | 132.9176 |
| 875.33  | 0.0000   |
| 879.36  | 144.8805 |
| 880.51  | 137.0890 |
| 883.24  | 150.9044 |
| 884.68  | 140.1779 |
| 889.28  | 134.4580 |
| 898.04  | 143.6118 |
| 911.20  | 138.1742 |
| 911.20  | 138.1742 |
| 911.20  | 138.1742 |
| 926.50  | 130.7808 |
| 937.49  | 155.9779 |
| 944.13  | 148.2725 |
| 946.00  | 140.3746 |
| 949.00  | 124.5397 |
| 962.29  | 133.6544 |
| 964.08  | 123.0000 |
| 966.15  | 123.0601 |
| 968.97  | 123.1451 |
| 968.97  | 123.1451 |
| 968.97  | 123.1451 |
| 983.53  | 131.6157 |
| 996.26  | 152.1705 |
| 1001.03 | 126.1114 |
| 1004.73 | 148.4355 |
| 1037.84 | 132.2852 |
| 1038.76 | 0.0000   |
| 1048.07 | 141.7771 |
| 1050.41 | 126.5480 |
| 1050.41 | 126.5480 |
| 1063.66 | 131.0208 |
| 1085.87 | 137.8495 |
| 1099.45 | 150.6457 |
| 1112.07 | 122.3913 |
| 1115.54 | 106.5067 |

|         |          |
|---------|----------|
| 1120.29 | 134.7502 |
| 1120.29 | 134.7502 |
| 1120.55 | 134.7607 |
| 1121.30 | 134.7819 |
| 1131.51 | 0.0000   |
| 1173.23 | 176.1211 |
| 1177.93 | 143.7675 |
| 1189.05 | 143.0501 |
| 1204.77 | 165.6754 |
| 1221.41 | 167.3028 |
| 1231.02 | 170.9651 |
| 1235.36 | 176.5771 |
| 1238.28 | 158.4643 |
| 1260.41 | 0.0000   |
| 1271.85 | 118.7324 |
| 1274.44 | 115.5806 |
| 1274.54 | 128.4277 |
| 1291.59 | 104.1597 |
| 1298.22 | 0.0000   |
| 1312.11 | 92.7188  |
| 1332.49 | 74.6826  |
| 1365.19 | 56.9428  |
| 1368.63 | 0.0000   |
| 1384.29 | 77.0520  |
| 1408.01 | 65.8643  |
| 1457.56 | 0.0000   |
| 1460.82 | 54.1472  |
| 1489.16 | 53.4648  |
| 1505.03 | 66.0592  |
| 1596.21 | 27.2266  |
| 1620.50 | 44.7315  |
| 1678.03 | 0.0000   |
| 1690.97 | 33.5743  |
| 1764.49 | 33.9644  |
| 1764.49 | 33.9644  |
| 1770.23 | 26.2454  |
| 1771.35 | 22.7500  |
| 1791.20 | 0.0000   |
| 1836.06 | 27.2665  |

TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G247964005

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 1.0026E+01 | ug/g |
| Total Uranium Counting Unc. | 8.0024E+00 | ug/g |
| Total Uranium Tpu           | 4.0829E-06 | ug/g |
| Total Uranium Mda           | 4.6955E+00 | ug/g |



```

*****
*
*               GEL Laboratories LLC
*               2040 SAVAGE ROAD
*               CHARLESTON ,SC 29417
*               GROSS GAMMA REPORT
*
*****
*
*  BATCH ID      : 958216          SAMPLE ID   : G247964005
*  ANALYST       : MXR1            DETECTOR    : GAM15
*  SAMPLE DATE   : 19-FEB-2010 12:00:00.00  COUNT TIME : 0 04:00:00.00
*  ANALYSIS DATE : 10-MAR-2010 23:10:07.05  SAMPLE ALQT: 123.990 GRAM
*
*****

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```

GROSS GAMMA ACTIVITY (pCi/GRAM ) : 1.393E+01
GROSS GAMMA ERROR   (pCi/GRAM ) : 1.596E+00
GROSS GAMMA MDA      (pCi/GRAM ) : 4.976E+00
GROSS GAMMA DLC      (pCi/GRAM ) : 2.443E+00

```

VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 16:19:17.92

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                   *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247970001.CNF;1
Sample date        : 23-FEB-2010 12:00:00 Acquisition date : 11-MAR-2010 14:18:08
Sample ID          : G247970001 Sample quantity : 1.26980E+02 GRAM
Detector name      : GAM18 Detector geometry: CAN
Elapsed live time  : 0 02:00:00.00 Elapsed real time: 0 02:00:01.85 0.0%
Energy tolerance   : 1.50000 keV Analyst Initials : MXR1
Abundance limit    : 75.00000 Sensitivity : 5.00000
Batch ID           : 958216 Detector SN# :
Matrix Spike ID    : LCS ID : 1032-A
*****

```

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|------|----|----------|------|----------|
| 1  | 2  | 75.01    | 442  | 478   | 1.18 | 149.14  | 144  | 15 | 6.14E-02 | 9.8  | 3.40E+00 |
| 2  | 2  | 77.28*   | 808  | 456   | 1.17 | 153.68  | 144  | 15 | 1.12E-01 | 5.9  |          |
| 3  | 0  | 87.33    | 276  | 478   | 1.54 | 173.76  | 171  | 7  | 3.84E-02 | 14.4 |          |
| 4  | 0  | 93.10*   | 291  | 601   | 1.36 | 185.31  | 182  | 9  | 4.04E-02 | 17.0 |          |
| 5  | 0  | 105.69   | 90   | 333   | 1.03 | 210.47  | 208  | 7  | 1.26E-02 | 34.9 |          |
| 6  | 0  | 129.09   | 94   | 335   | 1.23 | 257.25  | 255  | 7  | 1.31E-02 | 33.8 |          |
| 7  | 0  | 185.95*  | 285  | 453   | 1.20 | 370.94  | 365  | 12 | 3.96E-02 | 16.7 |          |
| 8  | 0  | 209.22   | 179  | 357   | 0.97 | 417.47  | 413  | 9  | 2.49E-02 | 20.4 |          |
| 9  | 3  | 238.64*  | 1902 | 251   | 1.20 | 476.28  | 471  | 19 | 2.64E-01 | 2.7  | 1.30E+00 |
| 10 | 3  | 241.61*  | 443  | 313   | 1.77 | 482.22  | 471  | 19 | 6.16E-02 | 11.7 |          |
| 11 | 0  | 269.84   | 146  | 232   | 1.84 | 538.67  | 534  | 9  | 2.02E-02 | 20.6 |          |
| 12 | 0  | 278.01   | 80   | 284   | 1.50 | 555.00  | 549  | 10 | 1.11E-02 | 41.5 |          |
| 13 | 4  | 295.17*  | 616  | 177   | 1.56 | 589.31  | 581  | 25 | 8.55E-02 | 5.6  | 3.52E+00 |
| 14 | 4  | 300.00*  | 183  | 204   | 2.07 | 598.96  | 581  | 25 | 2.54E-02 | 18.5 |          |
| 15 | 0  | 327.77   | 134  | 253   | 1.46 | 654.48  | 649  | 12 | 1.86E-02 | 25.2 |          |
| 16 | 0  | 338.13*  | 409  | 270   | 1.28 | 675.20  | 668  | 13 | 5.67E-02 | 9.8  |          |
| 17 | 0  | 351.78*  | 1050 | 221   | 1.38 | 702.50  | 698  | 12 | 1.46E-01 | 4.3  |          |
| 18 | 0  | 409.26   | 89   | 189   | 1.88 | 817.42  | 813  | 11 | 1.24E-02 | 31.5 |          |
| 19 | 0  | 463.68   | 100  | 196   | 1.18 | 926.22  | 918  | 13 | 1.38E-02 | 30.8 |          |
| 20 | 0  | 510.44*  | 234  | 179   | 2.28 | 1019.72 | 1013 | 14 | 3.25E-02 | 16.2 |          |
| 21 | 0  | 582.75*  | 682  | 142   | 1.49 | 1164.29 | 1156 | 15 | 9.47E-02 | 5.5  |          |
| 22 | 0  | 608.88*  | 698  | 267   | 1.60 | 1216.53 | 1209 | 17 | 9.70E-02 | 6.7  |          |
| 23 | 0  | 726.85   | 176  | 112   | 1.45 | 1452.42 | 1445 | 14 | 2.45E-02 | 14.8 |          |
| 24 | 0  | 767.94   | 115  | 103   | 1.86 | 1534.58 | 1528 | 14 | 1.60E-02 | 20.8 |          |
| 25 | 0  | 795.14   | 81   | 118   | 1.51 | 1588.97 | 1581 | 14 | 1.13E-02 | 30.6 |          |
| 26 | 0  | 860.79   | 94   | 151   | 1.16 | 1720.24 | 1711 | 19 | 1.31E-02 | 32.9 |          |
| 27 | 0  | 910.35*  | 523  | 93    | 1.80 | 1819.34 | 1810 | 17 | 7.26E-02 | 6.2  |          |
| 28 | 0  | 968.45*  | 207  | 130   | 1.79 | 1935.53 | 1930 | 11 | 2.88E-02 | 13.1 |          |
| 29 | 0  | 1119.44* | 166  | 114   | 2.07 | 2237.44 | 2231 | 16 | 2.30E-02 | 16.5 |          |
| 30 | 0  | 1376.77  | 71   | 32    | 2.30 | 2752.03 | 2747 | 12 | 9.80E-03 | 20.2 |          |
| 31 | 0  | 1459.55* | 2623 | 29    | 2.28 | 2917.59 | 2906 | 24 | 3.64E-01 | 2.0  |          |
| 32 | 0  | 1587.83  | 33   | 48    | 1.98 | 3174.12 | 3163 | 16 | 4.58E-03 | 50.1 |          |
| 33 | 0  | 1762.80  | 151  | 19    | 2.45 | 3524.06 | 3514 | 23 | 2.10E-02 | 10.8 |          |

Flag: "\*" = Peak area was modified by background subtraction

## VMS Nuclide Identification Report V3.1 Generated 11-MAR-2010 16:19:21

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247970001.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8
Sample title      : MXR1
Sample date       : 23-FEB-2010 12:00:00 Acquisition date : 11-MAR-2010 14:18:08
Sample ID         : G247970001 Sample quantity : 126.98 GRAM
Sample type       : SOLID Sample geometry :
Detector name     : GAMMA18 Detector geometry: CAN
Elapsed live time : 0 02:00:00.00 Elapsed real time: 0 02:00:01.85 0.0%
Peak Width (FWHM): 3.00 Confidence level : 5.00 %
Energy tolerance : 1.50 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00 WTM error limit : 3.00

```

## Full Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| K-40    | +         | 1460.82      | *   | 3.840E+01           | 3.309E+00 | 4.322E-01      | 3.280E-02 | 88.847  |
| CD-109  | +         | 88.03        | *   | 3.505E+00           | 1.060E+00 | 1.466E+00      | 1.355E-01 | 2.391   |
| SN-126  |           | 64.28        |     | 3.214E-01           | 5.544E-01 | 9.365E-01      | 1.384E-01 | 0.343   |
|         | +         | 86.94        |     | 1.422E+00           | 7.184E-01 | 5.788E-01      | 2.400E-01 | 2.457   |
|         | +         | 87.57        | *   | 3.421E-01           | 1.035E-01 | 1.424E-01      | 1.312E-02 | 2.403   |
| EU-155  | +         | 86.55        |     | 4.150E-01           | 1.256E-01 | 1.669E-01      | 1.538E-02 | 2.486   |
|         | +         | 105.31       | *   | 1.648E-01           | 1.156E-01 | 1.540E-01      | 1.100E-02 | 1.070   |
| HG-203  |           | 70.83        |     | -3.617E-01          | 1.554E+00 | 2.283E+00      | 3.612E-01 | -0.158  |
|         |           | 72.87        |     | 1.508E+00           | 9.171E-01 | 1.409E+00      | 2.161E-01 | 1.070   |
|         | +         | 279.20       | *   | 5.900E-02           | 4.907E-02 | 5.372E-02      | 3.239E-03 | 1.098   |
| TL-208  | +         | 277.37       |     | 5.735E-01           | 4.796E-01 | 5.151E-01      | 5.526E-02 | 1.113   |
|         | +         | 583.19       | *   | 6.023E-01           | 8.120E-02 | 4.493E-02      | 3.516E-03 | 13.406  |
|         | +         | 860.56       |     | 7.666E-01           | 5.120E-01 | 3.944E-01      | 4.411E-02 | 1.944   |
| BI-211  |           | 72.87        |     | 5.967E+00           | 3.547E+00 | 5.578E+00      | 4.605E-01 | 1.070   |
|         | +         | 351.06       | *   | 4.405E+00           | 4.701E-01 | 2.756E-01      | 1.770E-02 | 15.984  |
| PB-212  | +         | 74.82        |     | 2.576E+00           | 6.021E-01 | 5.625E-01      | 7.212E-02 | 4.580   |
|         | +         | 77.11        |     | 2.657E+00           | 3.864E-01 | 3.183E-01      | 2.698E-02 | 8.347   |
|         | +         | 238.63       | *   | 1.898E+00           | 1.716E-01 | 7.869E-02      | 5.672E-03 | 24.125  |
|         | +         | 300.09       |     | 2.742E+00           | 1.038E+00 | 1.004E+00      | 8.388E-02 | 2.730   |
| BI-214  | +         | 609.32       | *   | 1.190E+00           | 1.912E-01 | 1.061E-01      | 9.537E-03 | 11.213  |
|         | +         | 1120.29      |     | 1.408E+00           | 4.851E-01 | 4.158E-01      | 4.004E-02 | 3.386   |
|         |           | 1764.49      |     | 1.471E+00           | 3.254E-01 | 6.663E-01      | 4.051E-02 | 2.208   |
| PB-214  | +         | 74.82        |     | 4.566E+00           | 1.036E+00 | 9.969E-01      | 1.148E-01 | 4.580   |
|         | +         | 77.11        |     | 4.684E+00           | 7.831E-01 | 5.612E-01      | 6.637E-02 | 8.347   |
|         | +         | 242.00       |     | 2.679E+00           | 6.609E-01 | 4.777E-01      | 3.841E-02 | 5.607   |
|         | +         | 295.22       |     | 1.636E+00           | 2.321E-01 | 1.778E-01      | 1.544E-02 | 9.198   |
|         | +         | 351.93       | *   | 1.599E+00           | 1.921E-01 | 9.875E-02      | 8.358E-03 | 16.191  |
| RA-224  | +         | 240.99       | *   | 4.737E+00           | 1.136E+00 | 8.424E-01      | 4.693E-02 | 5.623   |
| RA-226  | +         | 609.32       | *   | 1.190E+00           | 1.912E-01 | 1.061E-01      | 9.537E-03 | 11.213  |
|         | +         | 1120.29      |     | 1.408E+00           | 4.851E-01 | 4.158E-01      | 4.004E-02 | 3.386   |
|         |           | 1764.49      |     | 1.471E+00           | 3.254E-01 | 6.663E-01      | 4.051E-02 | 2.208   |
| AC-228  | +         | 338.32       |     | 1.920E+00           | 8.760E-01 | 3.238E-01      | 1.335E-01 | 5.928   |
|         | +         | 911.20       | *   | 2.153E+00           | 3.967E-01 | 1.711E-01      | 2.318E-02 | 12.580  |
|         | +         | 968.97       |     | 1.470E+00           | 5.310E-01 | 4.367E-01      | 1.089E-01 | 3.366   |

---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| RA-228  | +         | 338.32       |     | 1.920E+00           | 8.760E-01 | 3.238E-01      | 1.335E-01 | 5.928   |
|         | +         | 911.20       | *   | 2.153E+00           | 3.967E-01 | 1.711E-01      | 2.318E-02 | 12.580  |
|         | +         | 968.97       |     | 1.470E+00           | 5.310E-01 | 4.367E-01      | 1.089E-01 | 3.366   |
| TH-228  | +         | 74.82        |     | 2.576E+00           | 5.483E-01 | 5.625E-01      | 4.744E-02 | 4.580   |
|         | +         | 77.11        |     | 2.657E+00           | 3.864E-01 | 3.183E-01      | 2.698E-02 | 8.347   |
|         | +         | 238.63       | *   | 1.898E+00           | 1.716E-01 | 7.869E-02      | 5.672E-03 | 24.125  |
|         | +         | 300.09       |     | 2.742E+00           | 1.952E+00 | 1.004E+00      | 6.115E-01 | 2.730   |
| TH-232  | +         | 338.32       |     | 1.920E+00           | 3.918E-01 | 3.238E-01      | 1.873E-02 | 5.928   |
|         | +         | 911.20       | *   | 2.153E+00           | 3.967E-01 | 1.711E-01      | 2.318E-02 | 12.580  |
|         | +         | 968.97       |     | 1.470E+00           | 5.310E-01 | 4.367E-01      | 1.089E-01 | 3.366   |
| NP-237  | +         | 86.48        | *   | 1.021E+00           | 3.757E-01 | 4.110E-01      | 9.399E-02 | 2.484   |
|         |           | 95.86        |     | -5.999E-01          | 9.807E-01 | 1.368E+00      | 3.253E-01 | -0.439  |
| ANH-511 | +         | 511.00       | *   | 1.604E-01           | 5.300E-02 | 3.953E-02      | 2.610E-03 | 4.057   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| BE-7    |           | 477.60       | *   | -1.650E-02          | 2.578E-01 | 4.236E-01           | 3.068E-02 | -0.039  |
| NA-22   |           | 1274.54      | *   | -1.619E-02          | 4.235E-02 | 6.770E-02           | 4.606E-03 | -0.239  |
| NA-24   |           | 1368.63      | *   | -9.629E-01          | 4.235E-02 | Half-Life too short |           |         |
| SC-46   |           | 889.28       | *   | -2.067E-03          | 3.257E-02 | 5.297E-02           | 5.909E-03 | -0.039  |
|         | +         | 1120.55      |     | 2.401E-01           | 8.115E-02 | 1.108E-01           | 7.656E-03 | 2.166   |
| V-48    |           | 944.13       |     | -5.736E-04          | 7.659E-01 | 1.245E+00           | 1.317E-01 | 0.000   |
|         |           | 983.53       | *   | 5.960E-02           | 6.445E-02 | 1.110E-01           | 1.097E-02 | 0.537   |
|         |           | 1312.11      |     | 1.017E-02           | 7.509E-02 | 1.243E-01           | 9.053E-03 | 0.082   |
| CR-51   |           | 320.08       | *   | 1.611E-01           | 3.188E-01 | 5.267E-01           | 3.386E-02 | 0.306   |
| MN-54   |           | 834.85       | *   | 5.489E-03           | 3.418E-02 | 5.671E-02           | 5.809E-03 | 0.097   |
| CO-56   |           | 846.77       | *   | -3.111E-02          | 3.596E-02 | 5.538E-02           | 5.782E-03 | -0.562  |
|         |           | 1037.84      |     | 2.105E-01           | 2.729E-01 | 4.783E-01           | 4.427E-02 | 0.440   |
|         |           | 1238.28      |     | 1.117E-01           | 8.649E-02 | 1.491E-01           | 9.943E-03 | 0.749   |
|         |           | 1771.35      |     | -8.376E-02          | 1.986E-01 | 2.481E-01           | 1.500E-02 | -0.338  |
| CO-57   |           | 122.06       | *   | 2.055E-02           | 2.409E-02 | 3.991E-02           | 2.364E-03 | 0.515   |
|         |           | 136.47       |     | -6.034E-02          | 1.920E-01 | 3.017E-01           | 1.971E-02 | -0.200  |
| CO-58   |           | 810.76       | *   | 4.912E-04           | 3.456E-02 | 5.702E-02           | 5.629E-03 | 0.009   |
| FE-59   |           | 1099.45      | *   | -5.730E-02          | 7.854E-02 | 1.238E-01           | 1.019E-02 | -0.463  |
|         |           | 1291.59      |     | -3.147E-02          | 1.089E-01 | 1.745E-01           | 1.467E-02 | -0.180  |
| CO-60   |           | 1173.23      |     | 1.811E-03           | 4.105E-02 | 6.813E-02           | 3.765E-03 | 0.027   |
|         |           | 1332.49      | *   | 2.265E-02           | 3.119E-02 | 5.437E-02           | 4.108E-03 | 0.417   |
| ZN-65   |           | 1115.54      | *   | 1.160E-01           | 9.651E-02 | 1.510E-01           | 1.064E-02 | 0.768   |
| SE-75   |           | 121.12       |     | 1.202E-01           | 1.254E-01 | 2.082E-01           | 1.910E-02 | 0.578   |
|         |           | 136.00       |     | -1.924E-02          | 3.717E-02 | 5.791E-02           | 3.300E-03 | -0.332  |
|         |           | 264.66       | *   | 3.244E-02           | 4.275E-02 | 6.415E-02           | 3.670E-03 | 0.506   |
|         |           | 279.54       |     | 3.693E-02           | 1.078E-01 | 1.569E-01           | 9.708E-03 | 0.235   |
|         |           | 400.66       |     | -5.002E-02          | 2.028E-01 | 3.348E-01           | 3.039E-02 | -0.149  |
| SR-85   |           | 514.00       | *   | 7.248E-02           | 3.884E-02 | 6.187E-02           | 4.099E-03 | 1.172   |
| Y-88    |           | 898.04       |     | -5.376E-02          | 3.562E-02 | 5.050E-02           | 5.725E-03 | -1.064  |
|         |           | 1836.06      | *   | -1.818E-03          | 2.695E-02 | 4.370E-02           | 2.489E-03 | -0.042  |
| Y-91    |           | 1204.77      | *   | -1.066E+01          | 1.968E+01 | 3.135E+01           | 1.853E+00 | -0.340  |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| NB-94   | 702.65    | *            |     | -7.209E-03          | 2.948E-02 | 4.853E-02           | 3.982E-03 | -0.149  |
|         | 871.09    |              |     | -2.814E-03          | 3.038E-02 | 4.830E-02           | 5.238E-03 | -0.058  |
| NB-95   | 765.81    | *            |     | 7.099E-02           | 4.208E-02 | 6.756E-02           | 6.180E-03 | 1.051   |
| NB-95M  | 235.69    | *            |     | 1.994E-01           | 1.251E-01 | 1.945E-01           | 1.432E-02 | 1.026   |
| ZR-95   | 724.19    |              |     | 2.235E-01           | 9.752E-02 | 1.606E-01           | 1.486E-02 | 1.392   |
|         | 756.73    | *            |     | 4.663E-02           | 6.287E-02 | 1.086E-01           | 1.073E-02 | 0.429   |
| MO-99   | 140.51    |              |     | -3.273E+00          | 2.721E+01 | 4.251E+01           | 9.695E+00 | -0.077  |
|         | 181.07    |              |     | -1.187E+01          | 2.165E+01 | 3.100E+01           | 5.429E+00 | -0.383  |
|         | 366.42    |              |     | 9.905E+01           | 1.023E+02 | 1.800E+02           | 1.040E+01 | 0.550   |
|         | 739.50    | *            |     | 7.459E+00           | 1.376E+01 | 2.272E+01           | 3.595E+00 | 0.328   |
|         | 777.92    |              |     | -7.675E+01          | 3.959E+01 | 5.563E+01           | 5.194E+00 | -1.379  |
| TC-99M  | 140.51    | *            |     | -6.583E+10          | 3.959E+01 | Half-Life too short |           |         |
| RU-103  | 497.08    | *            |     | -1.574E-02          | 3.289E-02 | 5.239E-02           | 6.691E-03 | -0.300  |
|         | 610.33    |              |     | 1.250E+01           | 2.571E+00 | 2.470E+00           | 3.873E-01 | 5.060   |
| RH-106  | 621.93    | *            |     | -5.015E-02          | 2.743E-01 | 4.367E-01           | 5.448E-02 | -0.115  |
|         | 1050.41   |              |     | 7.997E-01           | 2.230E+00 | 3.815E+00           | 3.260E-01 | 0.210   |
| RU-106  | 621.93    | *            |     | -5.015E-02          | 2.742E-01 | 4.367E-01           | 3.214E-02 | -0.115  |
|         | 1050.41   |              |     | 7.997E-01           | 2.230E+00 | 3.815E+00           | 3.260E-01 | 0.210   |
| AG-108M | 433.94    | *            |     | -1.468E-02          | 2.450E-02 | 3.938E-02           | 2.539E-03 | -0.373  |
|         | 614.28    |              |     | -3.190E-04          | 3.584E-02 | 4.982E-02           | 3.806E-03 | -0.006  |
|         | 722.91    |              |     | 1.799E-02           | 3.397E-02 | 5.101E-02           | 4.480E-03 | 0.353   |
| AG-110M | 657.76    | *            |     | -1.979E-02          | 2.776E-02 | 4.447E-02           | 3.508E-03 | -0.445  |
|         | 677.62    |              |     | -2.275E-01          | 2.548E-01 | 4.018E-01           | 3.262E-02 | -0.566  |
|         | 706.68    |              |     | 1.887E-02           | 1.775E-01 | 2.980E-01           | 2.539E-02 | 0.063   |
|         | 763.94    |              |     | 6.601E-02           | 1.450E-01 | 2.155E-01           | 2.013E-02 | 0.306   |
|         | 884.68    |              |     | 1.044E-02           | 4.127E-02 | 6.870E-02           | 7.758E-03 | 0.152   |
|         | 937.49    |              |     | -4.231E-02          | 1.003E-01 | 1.581E-01           | 1.731E-02 | -0.268  |
|         | 1384.29   |              |     | 8.870E-02           | 1.583E-01 | 2.363E-01           | 1.829E-02 | 0.375   |
|         | 1505.03   |              |     | 1.270E-01           | 2.355E-01 | 4.132E-01           | 2.966E-02 | 0.307   |
| SN-113  | 391.69    | *            |     | 2.568E-03           | 3.616E-02 | 6.081E-02           | 3.730E-03 | 0.042   |
| CD-115  | 260.90    |              |     | -2.477E+01          | 1.604E+02 | 2.606E+02           | 1.471E+01 | -0.095  |
|         | 492.35    |              |     | -5.263E+00          | 4.280E+01 | 6.990E+01           | 4.525E+00 | -0.075  |
|         | 527.90    | *            |     | 1.285E+01           | 1.275E+01 | 2.207E+01           | 1.484E+00 | 0.582   |
| SN-117M | 156.02    |              |     | -3.910E-01          | 2.077E+00 | 3.499E+00           | 1.869E-01 | -0.112  |
|         | 158.56    | *            |     | 2.226E-02           | 4.973E-02 | 8.551E-02           | 4.545E-03 | 0.260   |
| TE-123M | 159.00    | *            |     | 7.485E-03           | 2.473E-02 | 4.231E-02           | 2.283E-03 | 0.177   |
| SB-124  | 602.73    |              |     | 2.534E-02           | 3.856E-02 | 5.671E-02           | 4.102E-03 | 0.447   |
|         | 645.85    |              |     | -5.592E-01          | 4.280E-01 | 6.201E-01           | 5.011E-02 | -0.902  |
|         | 722.78    |              |     | 1.571E-01           | 3.435E-01 | 5.130E-01           | 4.462E-02 | 0.306   |
|         | 1690.97   | *            |     | -6.787E-03          | 6.059E-02 | 9.849E-02           | 6.821E-03 | -0.069  |
| SB-125  | 427.87    | *            |     | 4.206E-02           | 7.567E-02 | 1.295E-01           | 8.080E-03 | 0.325   |
|         | 463.37    |              |     | 6.144E-01           | 3.804E-01 | 4.561E-01           | 3.255E-02 | 1.347   |
|         | 600.60    |              |     | -1.079E-01          | 1.698E-01 | 2.466E-01           | 1.965E-02 | -0.438  |
|         | 635.95    |              |     | 3.254E-02           | 2.278E-01 | 3.700E-01           | 3.053E-02 | 0.088   |
| TE-125M | 109.28    | *            |     | 5.704E+00           | 1.032E+01 | 1.527E+01           | 1.370E+00 | 0.373   |
| I-126   | 388.63    |              |     | -1.042E-02          | 1.405E-01 | 2.347E-01           | 1.349E-02 | -0.044  |
|         | 666.33    | *            |     | 2.435E-01           | 1.934E-01 | 3.454E-01           | 2.655E-02 | 0.705   |
|         | 753.82    |              |     | 5.303E-01           | 1.639E+00 | 2.772E+00           | 2.485E-01 | 0.191   |
| SB-126  | 414.70    |              |     | -2.355E-02          | 7.560E-02 | 1.071E-01           | 6.333E-03 | -0.220  |

---- Non-Identified Nuclides ----

| Nuclide  | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|----------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| SB-127   |           | 666.50       |     | 8.102E-02           | 6.635E-02 | 1.183E-01      | 9.098E-03 | 0.685   |
|          |           | 695.00       |     | -9.412E-03          | 7.228E-02 | 1.199E-01      | 9.703E-03 | -0.079  |
|          |           | 697.00       |     | 3.663E-02           | 2.522E-01 | 4.246E-01      | 3.449E-02 | 0.086   |
|          |           | 720.70       | *   | -2.069E-02          | 1.417E-01 | 2.005E-01      | 1.698E-02 | -0.103  |
|          |           | 856.80       |     | 4.342E-01           | 5.132E-01 | 7.757E-01      | 8.227E-02 | 0.560   |
|          |           | 252.40       |     | 8.930E-01           | 4.468E+00 | 7.369E+00      | 3.028E+00 | 0.121   |
|          |           | 473.00       |     | -5.235E-01          | 1.598E+00 | 2.586E+00      | 3.011E-01 | -0.202  |
| I-131    |           | 685.70       | *   | -4.515E-01          | 1.307E+00 | 2.139E+00      | 2.392E-01 | -0.211  |
|          |           | 783.70       |     | 4.636E+00           | 3.618E+00 | 6.355E+00      | 8.379E-01 | 0.730   |
|          |           | 80.19        |     | -4.929E-02          | 5.156E+00 | 7.593E+00      | 6.625E-01 | -0.006  |
|          |           | 284.31       |     | 5.810E-01           | 1.357E+00 | 2.250E+00      | 1.433E-01 | 0.258   |
| TE-132   |           | 364.49       | *   | -7.125E-02          | 1.053E-01 | 1.716E-01      | 1.108E-02 | -0.415  |
|          |           | 636.99       |     | -3.281E-01          | 1.470E+00 | 2.328E+00      | 1.870E-01 | -0.141  |
|          |           | 49.72        |     | -2.788E+01          | 3.091E+01 | 5.016E+01      | 5.347E+00 | -0.556  |
|          |           | 111.76       |     | -3.456E+00          | 3.879E+01 | 6.239E+01      | 6.100E+00 | -0.055  |
| BA-133   |           | 116.30       |     | 1.713E+00           | 3.278E+01 | 5.287E+01      | 5.068E+00 | 0.032   |
|          |           | 228.16       | *   | 3.941E-01           | 8.080E-01 | 1.357E+00      | 1.979E-01 | 0.290   |
|          |           | 81.00        |     | -1.651E-01          | 1.067E-01 | 1.414E-01      | 2.203E-02 | -1.167  |
|          |           | 276.40       |     | 4.676E-01           | 3.704E-01 | 5.601E-01      | 7.023E-02 | 0.835   |
| I-133    |           | 302.85       |     | -2.360E-02          | 1.336E-01 | 1.865E-01      | 2.123E-02 | -0.127  |
|          |           | 356.01       | *   | -2.495E-02          | 4.141E-02 | 5.475E-02      | 6.169E-03 | -0.456  |
|          |           | 383.85       |     | -5.173E-02          | 2.300E-01 | 3.815E-01      | 4.059E-02 | -0.136  |
|          |           | 529.87       | *   | -4.825E-03          | 2.300E-01 | Half-Life      | too short |         |
| CS-134   |           | 875.33       |     | -4.130E-02          | 2.300E-01 | Half-Life      | too short |         |
|          |           | 1298.22      |     | -5.222E-02          | 2.300E-01 | Half-Life      | too short |         |
|          |           | 563.25       |     | 3.299E-01           | 3.152E-01 | 5.420E-01      | 3.830E-02 | 0.609   |
|          |           | 569.33       |     | -4.529E-02          | 1.815E-01 | 2.821E-01      | 2.017E-02 | -0.161  |
| + CS-135 |           | 604.72       |     | 1.981E-02           | 3.449E-02 | 5.026E-02      | 3.654E-03 | 0.394   |
|          |           | 795.86       | *   | 1.019E-01           | 6.304E-02 | 7.919E-02      | 7.659E-03 | 1.286   |
|          |           | 801.95       |     | -9.035E-02          | 3.773E-01 | 5.461E-01      | 5.328E-02 | -0.165  |
|          |           | 1365.19      |     | 6.491E-01           | 9.845E-01 | 1.711E+00      | 1.362E-01 | 0.379   |
| I-135    |           | 268.22       | *   | 1.810E-01           | 1.511E-01 | 2.310E-01      | 1.746E-02 | 0.784   |
|          |           | 546.56       |     | 1.107E+11           | 1.511E-01 | Half-Life      | too short |         |
|          |           | 836.80       |     | 1.569E+11           | 1.511E-01 | Half-Life      | too short |         |
|          |           | 1038.76      |     | 1.281E+11           | 1.511E-01 | Half-Life      | too short |         |
| CS-136   |           | 1131.51      |     | 8.943E+09           | 1.511E-01 | Half-Life      | too short |         |
|          |           | 1260.41      | *   | -3.379E+10          | 1.511E-01 | Half-Life      | too short |         |
|          |           | 1457.56      |     | 2.312E+13           | 1.511E-01 | Half-Life      | too short |         |
|          |           | 1678.03      |     | 1.850E+10           | 1.511E-01 | Half-Life      | too short |         |
|          |           | 1791.20      |     | 7.176E+09           | 1.511E-01 | Half-Life      | too short |         |
|          |           | 153.25       |     | 5.738E-01           | 7.884E-01 | 1.368E+00      | 1.059E-01 | 0.419   |
|          |           | 176.60       |     | -3.095E-02          | 4.585E-01 | 7.695E-01      | 5.107E-02 | -0.040  |
|          |           | 273.65       |     | -6.273E-01          | 7.943E-01 | 7.450E-01      | 5.022E-02 | -0.842  |
|          |           | 340.55       |     | 6.123E-01           | 1.619E-01 | 2.707E-01      | 1.695E-02 | 2.262   |
|          |           | 818.51       |     | 2.068E-02           | 6.545E-02 | 1.101E-01      | 1.099E-02 | 0.188   |
| BA-137M  |           | 1048.07      | *   | 2.368E-02           | 9.853E-02 | 1.673E-01      | 1.500E-02 | 0.142   |
|          |           | 1235.36      |     | 9.291E-01           | 5.764E-01 | 1.019E+00      | 1.038E-01 | 0.912   |
|          |           | 661.66       | *   | -1.301E-02          | 2.939E-02 | 4.802E-02      | 3.660E-03 | -0.271  |
|          |           | 661.66       | *   | -1.374E-02          | 3.105E-02 | 5.072E-02      | 3.876E-03 | -0.271  |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| CE-139  |           | 165.86       | *   | 1.246E-02           | 2.595E-02 | 4.455E-02      | 2.338E-03 | 0.280   |
| BA-140  |           | 162.66       |     | -6.233E-01          | 7.611E-01 | 1.230E+00      | 7.598E-02 | -0.507  |
|         |           | 304.85       |     | -6.269E-01          | 1.388E+00 | 1.882E+00      | 5.374E-01 | -0.333  |
|         |           | 423.72       |     | -3.144E-01          | 1.724E+00 | 2.840E+00      | 9.175E-01 | -0.111  |
|         |           | 537.26       | *   | -1.578E-01          | 2.531E-01 | 3.889E-01      | 1.303E-01 | -0.406  |
| LA-140  | +         | 328.76       |     | 8.260E-01           | 4.199E-01 | 5.054E-01      | 3.282E-02 | 1.634   |
|         |           | 487.02       |     | 4.527E-02           | 1.168E-01 | 1.966E-01      | 1.403E-02 | 0.230   |
|         |           | 815.77       |     | 1.350E-02           | 2.952E-01 | 4.878E-01      | 5.280E-02 | 0.028   |
|         |           | 1596.21      | *   | -7.238E-02          | 7.427E-02 | 9.674E-02      | 6.638E-03 | -0.748  |
| CE-141  |           | 145.44       | *   | 3.119E-02           | 6.188E-02 | 9.941E-02      | 5.676E-03 | 0.314   |
| CE-143  |           | 57.36        |     | -1.245E-03          | 6.188E-02 | Half-Life      | too short |         |
|         |           | 293.27       | *   | 1.382E-03           | 6.188E-02 | Half-Life      | too short |         |
|         |           | 664.57       |     | 1.797E-03           | 6.188E-02 | Half-Life      | too short |         |
|         |           | 721.93       |     | 3.763E-04           | 6.188E-02 | Half-Life      | too short |         |
| CE-144  |           | 80.12        |     | -1.339E-01          | 2.566E+00 | 3.771E+00      | 3.265E-01 | -0.035  |
|         |           | 133.52       | *   | 2.435E-02           | 2.066E-01 | 2.948E-01      | 4.077E-02 | 0.083   |
| PM-144  |           | 476.78       |     | -1.032E-03          | 5.267E-02 | 8.679E-02      | 6.371E-03 | -0.012  |
|         |           | 618.01       |     | -7.362E-03          | 3.038E-02 | 4.526E-02      | 3.447E-03 | -0.163  |
|         |           | 696.49       | *   | -3.714E-03          | 3.062E-02 | 5.081E-02      | 4.125E-03 | -0.073  |
| PR-144  |           | 696.51       | *   | -2.728E-01          | 2.293E+00 | 3.806E+00      | 3.089E-01 | -0.072  |
|         |           | 1489.16      |     | -4.175E+00          | 1.074E+01 | 1.655E+01      | 1.196E+00 | -0.252  |
| PM-146  |           | 453.88       | *   | 2.759E-02           | 3.440E-02 | 5.932E-02      | 5.182E-03 | 0.465   |
|         |           | 633.25       |     | -4.551E-01          | 1.190E+00 | 1.843E+00      | 6.993E-01 | -0.247  |
|         |           | 735.93       |     | 4.518E-03           | 1.190E-01 | 1.983E-01      | 5.563E-02 | 0.023   |
|         |           | 747.24       |     | 1.662E-02           | 8.130E-02 | 1.367E-01      | 2.013E-02 | 0.122   |
| ND-147  |           | 91.11        |     | 1.035E+00           | 3.887E-01 | 5.107E-01      | 4.807E-02 | 2.027   |
|         |           | 319.41       |     | -9.557E-01          | 3.077E+00 | 4.876E+00      | 2.817E-01 | -0.196  |
|         |           | 531.02       | *   | -3.447E-01          | 5.070E-01 | 7.903E-01      | 1.103E-01 | -0.436  |
| PM-149  |           | 285.90       | *   | -4.716E+01          | 1.060E+02 | 1.682E+02      | 2.379E+01 | -0.280  |
| EU-152  |           | 121.78       |     | 7.643E-02           | 6.913E-02 | 1.154E-01      | 8.857E-03 | 0.662   |
|         |           | 244.70       |     | -1.187E-02          | 3.054E-01 | 4.395E-01      | 2.455E-02 | -0.027  |
|         |           | 344.28       | *   | -6.314E-02          | 8.863E-02 | 1.243E-01      | 8.106E-03 | -0.508  |
|         |           | 778.90       |     | -2.388E-01          | 2.164E-01 | 3.291E-01      | 3.077E-02 | -0.725  |
|         |           | 964.08       |     | 8.328E-01           | 3.183E-01 | 5.191E-01      | 5.317E-02 | 1.604   |
|         |           | 1085.87      |     | 1.374E-01           | 3.548E-01 | 5.917E-01      | 4.583E-02 | 0.232   |
|         |           | 1112.07      |     | 2.714E-01           | 3.010E-01 | 4.653E-01      | 3.312E-02 | 0.583   |
|         |           | 1408.01      |     | 1.274E-01           | 1.728E-01 | 2.968E-01      | 2.204E-02 | 0.429   |
| GD-153  |           | 69.67        |     | -1.639E+00          | 1.925E+00 | 2.943E+00      | 2.389E-01 | -0.557  |
|         |           | 97.43        | *   | -7.110E-02          | 9.514E-02 | 1.309E-01      | 1.023E-02 | -0.543  |
|         |           | 103.18       |     | -1.362E-01          | 1.153E-01 | 1.554E-01      | 1.120E-02 | -0.876  |
| EU-154  |           | 123.07       |     | 1.116E-03           | 4.999E-02 | 8.025E-02      | 7.578E-03 | 0.014   |
|         |           | 723.31       |     | 1.954E-01           | 1.550E-01 | 2.454E-01      | 2.304E-02 | 0.796   |
|         |           | 873.19       |     | -1.360E-01          | 2.440E-01 | 3.822E-01      | 5.207E-02 | -0.356  |
|         |           | 996.26       |     | -9.529E-02          | 3.172E-01 | 5.006E-01      | 9.010E-02 | -0.190  |
|         |           | 1004.73      |     | -4.957E-02          | 1.944E-01 | 3.081E-01      | 3.788E-02 | -0.161  |
|         |           | 1274.44      | *   | -1.991E-02          | 1.184E-01 | 1.921E-01      | 1.933E-02 | -0.104  |
| TB-160  | +         | 86.79        |     | 1.111E+00           | 3.361E-01 | 4.987E-01      | 4.562E-02 | 2.228   |
|         |           | 197.04       |     | 3.738E-01           | 4.947E-01 | 8.367E-01      | 4.493E-02 | 0.447   |
|         |           | 215.65       |     | 4.248E-01           | 6.549E-01 | 1.113E+00      | 6.074E-02 | 0.382   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| HO-166M | +         | 298.57       |     | 3.898E-01           | 1.456E-01 | 1.805E-01      | 1.037E-02 | 2.159   |
|         |           | 879.36       | *   | 4.201E-02           | 1.189E-01 | 1.993E-01      | 2.190E-02 | 0.211   |
|         |           | 962.29       |     | 9.689E-01           | 5.504E-01 | 8.713E-01      | 8.951E-02 | 1.112   |
|         |           | 966.15       |     | 1.562E+00           | 3.142E-01 | 5.082E-01      | 5.186E-02 | 3.074   |
|         |           | 1177.93      |     | 2.714E-01           | 3.367E-01 | 5.838E-01      | 3.259E-02 | 0.465   |
|         |           | 1271.85      |     | -1.033E-01          | 6.713E-01 | 1.091E+00      | 7.370E-02 | -0.095  |
|         |           | 80.57        |     | -1.940E-01          | 2.842E-01 | 4.046E-01      | 3.515E-02 | -0.480  |
|         |           | 184.41       |     | 5.243E-02           | 3.580E-02 | 5.679E-02      | 3.017E-03 | 0.923   |
|         |           | 280.46       |     | -2.047E-02          | 8.075E-02 | 1.130E-01      | 6.447E-03 | -0.181  |
|         |           | 410.95       |     | 3.563E-01           | 2.410E-01 | 3.827E-01      | 2.253E-02 | 0.931   |
|         |           | 711.68       | *   | 2.344E-03           | 4.991E-02 | 8.346E-02      | 6.956E-03 | 0.028   |
|         |           | 752.31       |     | -6.041E-02          | 2.383E-01 | 3.893E-01      | 3.480E-02 | -0.155  |
| TA-182  |           | 810.29       |     | -1.916E-02          | 5.182E-02 | 8.329E-02      | 8.201E-03 | -0.230  |
|         |           | 67.75        |     | 4.971E-02           | 1.205E-01 | 2.017E-01      | 1.621E-02 | 0.246   |
|         |           | 100.11       |     | 2.877E-01           | 1.730E-01 | 2.960E-01      | 2.225E-02 | 0.972   |
|         |           | 152.43       |     | 1.910E-01           | 3.285E-01 | 5.310E-01      | 2.856E-02 | 0.360   |
|         |           | 222.11       |     | 2.876E-01           | 3.085E-01 | 5.284E-01      | 2.900E-02 | 0.544   |
|         |           | 1121.30      |     | 5.223E-01           | 1.772E-01 | 3.000E-01      | 2.067E-02 | 1.741   |
|         |           | 1189.05      |     | 1.181E-01           | 2.771E-01 | 4.703E-01      | 2.689E-02 | 0.251   |
|         |           | 1221.41      | *   | -6.317E-03          | 1.911E-01 | 3.146E-01      | 1.924E-02 | -0.020  |
|         |           | 1231.02      |     | -5.851E-01          | 4.744E-01 | 7.241E-01      | 4.516E-02 | -0.808  |
|         | +         | 295.96       |     | 1.221E+00           | 1.544E-01 | 2.547E-01      | 1.486E-02 | 4.792   |
|         |           | 308.46       |     | 5.419E-02           | 8.530E-02 | 1.420E-01      | 8.272E-03 | 0.382   |
|         |           | 316.51       | *   | 1.054E-02           | 3.005E-02 | 4.930E-02      | 2.859E-03 | 0.214   |
| BI-207  |           | 468.07       |     | 3.096E-02           | 6.088E-02 | 9.082E-02      | 6.481E-03 | 0.341   |
|         |           | 72.81        |     | 3.179E-01           | 2.034E-01 | 3.188E-01      | 2.632E-02 | 0.997   |
|         | +         | 74.97        |     | 7.426E-01           | 1.578E-01 | 2.376E-01      | 1.986E-02 | 3.126   |
|         |           | 569.70       |     | 3.920E-03           | 2.813E-02 | 4.476E-02      | 3.137E-03 | 0.088   |
|         |           | 1063.66      | *   | 3.558E-02           | 4.568E-02 | 8.002E-02      | 6.605E-03 | 0.445   |
|         |           | 1770.23      |     | 3.105E-02           | 3.621E-01 | 5.159E-01      | 3.121E-02 | 0.060   |
|         |           | 46.54        | *   | -1.382E-01          | 5.151E+00 | 8.538E+00      | 6.545E-01 | -0.016  |
|         |           | 404.85       | *   | -2.608E-01          | 6.355E-01 | 8.757E-01      | 4.201E-01 | -0.298  |
|         |           | 427.09       |     | 1.481E-01           | 1.285E+00 | 2.149E+00      | 9.851E-01 | 0.069   |
|         |           | 832.01       |     | 1.417E-01           | 8.909E-01 | 1.470E+00      | 7.666E-01 | 0.096   |
|         | +         | 727.33       | *   | 2.338E+00           | 7.508E-01 | 1.004E+00      | 1.247E-01 | 2.329   |
|         |           | 785.37       |     | 1.504E+00           | 2.910E+00 | 4.784E+00      | 4.522E-01 | 0.314   |
| RN-219  |           | 1620.50      |     | 1.962E+00           | 2.284E+00 | 4.083E+00      | 2.761E-01 | 0.480   |
|         | +         | 271.23       |     | 6.268E-01           | 2.631E-01 | 3.831E-01      | 3.043E-02 | 1.636   |
|         |           | 401.81       | *   | -1.286E-01          | 3.149E-01 | 5.145E-01      | 6.917E-02 | -0.250  |
|         |           | 81.07        |     | -3.699E-01          | 2.368E-01 | 3.206E-01      | 2.796E-02 | -1.154  |
|         |           | 83.79        |     | 2.352E-01           | 1.365E-01 | 2.123E-01      | 1.892E-02 | 1.108   |
|         |           | 94.87        |     | 1.305E+00           | 4.929E-01 | 7.852E-01      | 6.394E-02 | 1.662   |
|         |           | 144.24       |     | 4.918E-01           | 6.505E-01 | 1.054E+00      | 7.333E-02 | 0.466   |
|         |           | 154.21       |     | 2.893E-01           | 3.427E-01 | 5.966E-01      | 3.941E-02 | 0.485   |
|         | +         | 269.46       |     | 4.870E-01           | 2.028E-01 | 2.949E-01      | 1.749E-02 | 1.651   |
|         |           | 323.87       | *   | 5.512E-02           | 5.980E-01 | 8.455E-01      | 1.362E-01 | 0.065   |
|         | +         | 338.28       |     | 7.618E+00           | 1.683E+00 | 2.108E+00      | 2.159E-01 | 3.614   |
|         |           | 79.69        |     | -5.613E-01          | 1.284E+00 | 1.848E+00      | 3.187E-01 | -0.304  |
| AC-227  |           | 235.96       |     | 5.511E-01           | 1.659E-01 | 2.677E-01      | 2.132E-02 | 2.059   |



---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TH-227  |           | 256.23       | *   | -1.207E-01          | 2.179E-01 | 3.478E-01      | 3.523E-02 | -0.347  |
|         | +         | 299.98       |     | 3.016E+00           | 1.162E+00 | 1.412E+00      | 1.547E-01 | 2.137   |
|         |           | 304.50       |     | -8.953E-01          | 1.571E+00 | 2.122E+00      | 3.232E-01 | -0.422  |
|         |           | 334.37       |     | 9.037E-01           | 1.962E+00 | 2.402E+00      | 3.415E-01 | 0.376   |
|         |           | 79.80        |     | -4.116E-01          | 1.681E+00 | 2.445E+00      | 5.326E-01 | -0.168  |
|         |           | 235.96       |     | 5.511E-01           | 1.648E-01 | 2.677E-01      | 1.925E-02 | 2.059   |
| TH-229  |           | 256.23       | *   | -1.207E-01          | 2.181E-01 | 3.478E-01      | 4.151E-02 | -0.347  |
|         | +         | 299.98       |     | 3.016E+00           | 1.162E+00 | 1.412E+00      | 1.547E-01 | 2.137   |
|         |           | 304.50       |     | -8.953E-01          | 1.571E+00 | 2.122E+00      | 3.232E-01 | -0.422  |
|         |           | 334.37       |     | 9.037E-01           | 1.962E+00 | 2.402E+00      | 3.415E-01 | 0.376   |
|         |           | 85.43        |     | 2.586E-01           | 2.326E-01 | 3.543E-01      | 3.203E-02 | 0.730   |
|         | +         | 88.47        |     | 5.275E-01           | 1.596E-01 | 2.294E-01      | 2.101E-02 | 2.300   |
| PA-231  |           | 193.51       | *   | -1.145E-01          | 4.529E-01 | 7.503E-01      | 4.017E-02 | -0.153  |
|         |           | 210.85       |     | 1.719E+00           | 8.713E-01 | 1.390E+00      | 7.555E-02 | 1.237   |
|         |           | 283.69       | *   | 5.876E-01           | 1.264E+00 | 2.029E+00      | 2.654E-01 | 0.290   |
| TH-231  | +         | 301.36       |     | 1.938E+00           | 7.427E-01 | 8.750E-01      | 9.026E-02 | 2.215   |
|         |           | 81.07        |     | -3.699E-01          | 2.368E-01 | 3.206E-01      | 2.796E-02 | -1.154  |
|         |           | 83.79        |     | 2.352E-01           | 1.365E-01 | 2.123E-01      | 1.892E-02 | 1.108   |
|         |           | 94.87        |     | 1.305E+00           | 4.929E-01 | 7.852E-01      | 6.394E-02 | 1.662   |
|         |           | 144.24       |     | 4.918E-01           | 6.505E-01 | 1.054E+00      | 7.333E-02 | 0.466   |
|         |           | 154.21       |     | 2.893E-01           | 3.427E-01 | 5.966E-01      | 3.941E-02 | 0.485   |
| PA-233  | +         | 269.46       |     | 4.870E-01           | 2.028E-01 | 2.949E-01      | 1.749E-02 | 1.651   |
|         |           | 323.87       | *   | 5.512E-02           | 5.980E-01 | 8.455E-01      | 1.362E-01 | 0.065   |
|         | +         | 338.28       |     | 7.618E+00           | 1.683E+00 | 2.108E+00      | 2.159E-01 | 3.614   |
|         | +         | 300.13       |     | 1.365E+00           | 5.358E-01 | 6.423E-01      | 8.584E-02 | 2.125   |
|         |           | 311.90       | *   | -4.847E-02          | 5.612E-02 | 8.642E-02      | 5.295E-03 | -0.561  |
|         |           | 340.48       |     | 2.717E+00           | 9.029E-01 | 1.124E+00      | 2.609E-01 | 2.416   |
| PA-234  |           | 94.67        |     | 6.159E-01           | 1.939E-01 | 2.991E-01      | 3.617E-02 | 2.060   |
|         |           | 98.44        |     | 4.711E-02           | 9.926E-02 | 1.488E-01      | 8.280E-02 | 0.317   |
|         |           | 111.00       |     | -6.962E-02          | 1.766E-01 | 2.805E-01      | 3.009E-02 | -0.248  |
|         |           | 131.20       |     | -2.158E-02          | 1.101E-01 | 1.547E-01      | 8.804E-03 | -0.140  |
|         |           | 569.50       |     | 7.907E-03           | 2.482E-01 | 3.924E-01      | 2.749E-02 | 0.020   |
|         |           | 733.00       |     | -1.433E-01          | 3.477E-01 | 4.757E-01      | 1.057E-01 | -0.301  |
| PA-234M |           | 880.51       |     | 1.799E-02           | 2.376E-01 | 3.908E-01      | 4.301E-02 | 0.046   |
|         |           | 883.24       |     | 9.880E-02           | 2.516E-01 | 4.083E-01      | 2.759E-01 | 0.242   |
|         |           | 926.50       |     | -1.163E-01          | 1.575E-01 | 2.375E-01      | 6.207E-02 | -0.490  |
|         |           | 946.00       | *   | -4.673E-02          | 2.580E-01 | 4.133E-01      | 8.153E-02 | -0.113  |
|         |           | 949.00       |     | 2.120E-01           | 3.826E-01 | 6.455E-01      | 6.779E-02 | 0.328   |
|         |           | 766.42       |     | 1.725E+01           | 1.430E+01 | 1.806E+01      | 9.179E+00 | 0.955   |
| TH-234  |           | 1001.03      | *   | -1.927E-01          | 4.144E+00 | 6.689E+00      | 7.216E-01 | -0.029  |
|         |           | 63.29        | *   | 1.508E+00           | 1.508E+00 | 2.553E+00      | 4.598E-01 | 0.591   |
| U-235   | +         | 92.59        |     | 2.913E+00           | 1.179E+00 | 1.329E+00      | 2.927E-01 | 2.192   |
|         |           | 89.96        |     | 6.247E-01           | 1.182E+00 | 1.399E+00      | 3.458E-01 | 0.446   |
| U-238   | +         | 93.35        |     | 2.201E+00           | 9.033E-01 | 9.881E-01      | 2.273E-01 | 2.227   |
|         |           | 143.76       | *   | 6.043E-02           | 1.961E-01 | 3.127E-01      | 4.877E-02 | 0.193   |
|         |           | 163.33       |     | -9.788E-02          | 3.863E-01 | 6.370E-01      | 1.058E-01 | -0.154  |
|         | +         | 185.72       |     | 1.926E-01           | 6.520E-02 | 7.764E-02      | 4.130E-03 | 2.481   |
|         |           | 205.31       |     | -6.489E-02          | 4.683E-01 | 6.791E-01      | 1.145E-01 | -0.096  |
|         |           | 63.29        | *   | 1.508E+00           | 1.508E+00 | 2.553E+00      | 4.598E-01 | 0.591   |

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| NP-239  | +         | 92.59        |     | 2.913E+00           | 1.020E+00 | 1.329E+00      | 1.125E-01 | 2.192   |
|         |           | 99.53        |     | 2.901E-01           | 1.591E-01 | 2.734E-01      | 2.073E-02 | 1.061   |
|         |           | 103.37       |     | -7.998E-02          | 1.024E-01 | 1.415E-01      | 1.018E-02 | -0.565  |
|         | +         | 106.12       |     | 1.314E-01           | 9.211E-02 | 1.343E-01      | 9.336E-03 | 0.978   |
|         |           | 117.23       | *   | -1.964E-01          | 3.675E-01 | 5.779E-01      | 3.569E-02 | -0.340  |
| AM-241  |           | 228.18       |     | 9.686E-02           | 1.933E-01 | 3.255E-01      | 1.796E-02 | 0.298   |
|         | +         | 277.60       |     | 2.621E-01           | 2.179E-01 | 2.683E-01      | 1.528E-02 | 0.977   |
|         |           | 59.54        | *   | 5.609E-02           | 1.695E-01 | 2.869E-01      | 2.380E-02 | 0.195   |
| CM-247  | +         | 278.00       |     | 1.113E+00           | 9.256E-01 | 1.124E+00      | 6.401E-02 | 0.991   |
|         |           | 287.50       |     | 2.437E-01           | 1.099E+00 | 1.672E+00      | 9.565E-02 | 0.146   |
|         |           | 402.40       | *   | -2.190E-02          | 2.962E-02 | 4.612E-02      | 2.685E-03 | -0.475  |
| CF-249  |           | 252.80       |     | -1.613E-01          | 8.296E-01 | 1.349E+00      | 7.579E-02 | -0.120  |
|         |           | 333.37       |     | 2.158E-01           | 2.286E-01 | 2.568E-01      | 1.485E-02 | 0.840   |
|         |           | 388.16       | *   | 8.011E-03           | 3.168E-02 | 5.380E-02      | 3.093E-03 | 0.149   |
| CF-251  |           | 177.52       | *   | -5.622E-03          | 1.137E-01 | 1.909E-01      | 1.009E-02 | -0.029  |
|         |           | 227.38       |     | -2.398E-01          | 3.184E-01 | 5.106E-01      | 2.814E-02 | -0.470  |
|         |           | 285.41       |     | -1.004E+00          | 1.844E+00 | 2.917E+00      | 1.667E-01 | -0.344  |

## VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*                                     DETECTOR DATA                          *
*                                     *                                       *
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247970001      *
* Acquisition date   : 11-MAR-2010 14:18:08 Detector SN# :                   *
* Detector ID        : GAM18 Sensitivity : 5.000                          *
* Geometry           : CAN Energy tolerance: 1.500                       *
* Elapsed live time  : 0 02:00:00.00 Abundance limit : 75.000            *
* Elapsed real time  : 0 02:00:01.85 Half life ratio : 8.000             *
*****
*                                     SAMPLE DATA                            *
*                                     *                                       *
* Sample date       : 23-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID         : G247970001 Analyst initials: MXR1                 *
* Batch Number      : 958216 Sample Quantity : 1.2698E+02 GRAM          *
* Recovery          : 1.00000 Carrier Weight : 0.00000                  *
*****
*                                     QC DATA                               *
*                                     *                                       *
* Standard Weight   : 0.00000                                             *
* CALIB. DATE/TIME : 23-APR-2009 11:59:23 MS Isotope :                   *
* MSD DPM           : 0.000 MSD Isotope :                               *
* LCS DPM           : 0.000 LCS Isotope :                               *
* LCSD DPM          : 0.000 LCSD Isotope :                               *
*****

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## Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act error | MDA<br>(pCi/GRAM ) |           |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.840E+01               | 3.243E+00 | 4.321E-01          | 0.000E+00 |
| CD-109  | 3.505E+00               | 1.039E+00 | 1.528E+00          | 0.000E+00 |
| SN-126  | 3.421E-01               | 1.014E-01 | 1.484E-01          | 0.000E+00 |
| EU-155  | 1.648E-01               | 1.133E-01 | 1.601E-01          | 0.000E+00 |
| HG-203  | 5.900E-02               | 4.809E-02 | 5.506E-02          | 0.000E+00 |
| TL-208  | 6.023E-01               | 7.958E-02 | 4.554E-02          | 0.000E+00 |
| BI-211  | 4.405E+00               | 4.607E-01 | 2.815E-01          | 0.000E+00 |
| PB-212  | 1.898E+00               | 1.681E-01 | 8.082E-02          | 0.000E+00 |
| BI-214  | 1.190E+00               | 1.874E-01 | 1.075E-01          | 0.000E+00 |
| PB-214  | 1.599E+00               | 1.882E-01 | 1.009E-01          | 0.000E+00 |
| RA-224  | 4.737E+00               | 1.113E+00 | 8.651E-01          | 0.000E+00 |
| RA-226  | 1.190E+00               | 1.874E-01 | 1.075E-01          | 0.000E+00 |
| AC-228  | 2.153E+00               | 3.888E-01 | 1.723E-01          | 0.000E+00 |
| RA-228  | 2.153E+00               | 3.888E-01 | 1.723E-01          | 0.000E+00 |
| TH-228  | 1.898E+00               | 1.681E-01 | 8.082E-02          | 0.000E+00 |
| TH-232  | 2.153E+00               | 3.888E-01 | 1.723E-01          | 0.000E+00 |
| NP-237  | 1.021E+00               | 3.682E-01 | 4.284E-01          | 0.000E+00 |
| ANH-511 | 1.604E-01               | 5.194E-02 | 4.015E-02          | 0.000E+00 |

## ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | -1.650E-02                          | 2.527E-01                | 4.307E-01          | 0.000E+00 NOT IDENT. |
| NA-22   | -1.619E-02                          | 4.150E-02                | 6.782E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 2.005E+06                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| SC-46   | -2.067E-03                          | 3.192E-02                | 5.336E-02          | 0.000E+00 FAIL ABUN  |
| V-48    | 5.960E-02                           | 6.316E-02                | 1.116E-01          | 0.000E+00 NOT IDENT. |
| CR-51   | 1.611E-01                           | 3.125E-01                | 5.387E-01          | 0.000E+00 NOT IDENT. |
| MN-54   | 5.489E-03                           | 3.349E-02                | 5.718E-02          | 0.000E+00 NOT IDENT. |
| CO-56   | -3.111E-02                          | 3.524E-02                | 5.583E-02          | 0.000E+00 NOT IDENT. |
| CO-57   | 2.055E-02                           | 2.361E-02                | 4.139E-02          | 0.000E+00 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CO-58   | 4.912E-04  | 3.387E-02 | 5.752E-02 | 0.000E+00 | NOT IDENT. |
| FE-59   | -5.730E-02 | 7.697E-02 | 1.243E-01 | 0.000E+00 | NOT IDENT. |
| CO-60   | 2.265E-02  | 3.057E-02 | 5.444E-02 | 0.000E+00 | NOT IDENT. |
| ZN-65   | 1.160E-01  | 9.458E-02 | 1.516E-01 | 0.000E+00 | NOT IDENT. |
| SE-75   | 3.244E-02  | 4.190E-02 | 6.579E-02 | 0.000E+00 | NOT IDENT. |
| SR-85   | 0.000E+00  | 3.806E-02 | 6.284E-02 | 0.000E+00 | NOT IDENT. |
| Y-88    | -1.818E-03 | 2.641E-02 | 4.353E-02 | 0.000E+00 | NOT IDENT. |
| Y-91    | -1.066E+01 | 1.928E+01 | 3.143E+01 | 0.000E+00 | NOT IDENT. |
| NB-94   | -7.209E-03 | 2.889E-02 | 4.906E-02 | 0.000E+00 | NOT IDENT. |
| NB-95   | 0.000E+00  | 4.124E-02 | 6.821E-02 | 0.000E+00 | NOT IDENT. |
| NB-95M  | 1.994E-01  | 1.226E-01 | 1.998E-01 | 0.000E+00 | NOT IDENT. |
| ZR-95   | 4.663E-02  | 6.161E-02 | 1.097E-01 | 0.000E+00 | NOT IDENT. |
| MO-99   | 7.459E+00  | 1.348E+01 | 2.295E+01 | 0.000E+00 | NOT IDENT. |
| TC-99M  | 0.000E+00  | 5.365E+17 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | -1.574E-02 | 3.223E-02 | 5.324E-02 | 0.000E+00 | FAIL ABUN  |
| RH-106  | -5.015E-02 | 2.688E-01 | 4.423E-01 | 0.000E+00 | NOT IDENT. |
| RU-106  | -5.015E-02 | 2.687E-01 | 4.423E-01 | 0.000E+00 | NOT IDENT. |
| AG-108M | -1.468E-02 | 2.401E-02 | 4.010E-02 | 0.000E+00 | NOT IDENT. |
| AG-110M | -1.979E-02 | 2.720E-02 | 4.500E-02 | 0.000E+00 | NOT IDENT. |
| SN-113  | 2.568E-03  | 3.544E-02 | 6.201E-02 | 0.000E+00 | NOT IDENT. |
| CD-115  | 1.285E+01  | 1.250E+01 | 2.241E+01 | 0.000E+00 | NOT IDENT. |
| SN-117M | 2.226E-02  | 4.873E-02 | 8.835E-02 | 0.000E+00 | NOT IDENT. |
| TE-123M | 7.485E-03  | 2.423E-02 | 4.371E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | -6.787E-03 | 5.938E-02 | 9.824E-02 | 0.000E+00 | NOT IDENT. |
| SB-125  | 4.206E-02  | 7.416E-02 | 1.318E-01 | 0.000E+00 | FAIL ABUN  |
| TE-125M | 5.704E+00  | 1.011E+01 | 1.586E+01 | 0.000E+00 | NOT IDENT. |
| I-126   | 2.435E-01  | 1.895E-01 | 3.494E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | -2.069E-02 | 1.388E-01 | 2.026E-01 | 0.000E+00 | NOT IDENT. |
| SB-127  | -4.515E-01 | 1.281E+00 | 2.163E+00 | 0.000E+00 | NOT IDENT. |
| I-131   | -7.125E-02 | 1.032E-01 | 1.751E-01 | 0.000E+00 | NOT IDENT. |
| TE-132  | 3.941E-01  | 7.918E-01 | 1.395E+00 | 0.000E+00 | NOT IDENT. |
| BA-133  | -2.495E-02 | 4.058E-02 | 5.591E-02 | 0.000E+00 | NOT IDENT. |
| I-133   | 0.000E+00  | 1.076E+04 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | 0.000E+00  | 6.178E-02 | 7.990E-02 | 0.000E+00 | FAIL ABUN  |
| CS-135  | 1.810E-01  | 1.481E-01 | 2.369E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 7.214E+16 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | 2.368E-02  | 9.656E-02 | 1.681E-01 | 0.000E+00 | NOT IDENT. |
| BA-137M | -1.301E-02 | 2.880E-02 | 4.858E-02 | 0.000E+00 | NOT IDENT. |
| CS-137  | -1.374E-02 | 3.043E-02 | 5.132E-02 | 0.000E+00 | NOT IDENT. |
| CE-139  | 1.246E-02  | 2.543E-02 | 4.600E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | -1.578E-01 | 2.480E-01 | 3.947E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | -7.238E-02 | 7.279E-02 | 9.658E-02 | 0.000E+00 | FAIL ABUN  |
| CE-141  | 3.119E-02  | 6.064E-02 | 1.028E-01 | 0.000E+00 | NOT IDENT. |
| CE-143  | 0.000E+00  | 3.639E+02 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CE-144  | 2.435E-02  | 2.024E-01 | 3.054E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | -3.714E-03 | 3.001E-02 | 5.137E-02 | 0.000E+00 | NOT IDENT. |
| PR-144  | -2.728E-01 | 2.247E+00 | 3.848E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | 2.759E-02  | 3.371E-02 | 6.036E-02 | 0.000E+00 | NOT IDENT. |
| ND-147  | -3.447E-01 | 4.969E-01 | 8.022E-01 | 0.000E+00 | NOT IDENT. |
| PM-149  | -4.716E+01 | 1.039E+02 | 1.723E+02 | 0.000E+00 | NOT IDENT. |
| EU-152  | -6.314E-02 | 8.686E-02 | 1.270E-01 | 0.000E+00 | NOT IDENT. |
| GD-153  | -7.110E-02 | 9.324E-02 | 1.362E-01 | 0.000E+00 | NOT IDENT. |
| EU-154  | -1.991E-02 | 1.160E-01 | 1.924E-01 | 0.000E+00 | NOT IDENT. |
| TB-160  | 4.201E-02  | 1.165E-01 | 2.008E-01 | 0.000E+00 | FAIL ABUN  |
| HO-166M | 2.344E-03  | 4.891E-02 | 8.435E-02 | 0.000E+00 | NOT IDENT. |
| TA-182  | -6.317E-03 | 1.873E-01 | 3.153E-01 | 0.000E+00 | NOT IDENT. |
| IR-192  | 1.054E-02  | 2.945E-02 | 5.043E-02 | 0.000E+00 | FAIL ABUN  |
| BI-207  | 3.558E-02  | 4.477E-02 | 8.039E-02 | 0.000E+00 | FAIL ABUN  |
| PB-210  | -1.382E-01 | 5.048E+00 | 8.975E+00 | 0.000E+00 | NOT IDENT. |
| PB-211  | -2.608E-01 | 6.228E-01 | 8.925E-01 | 0.000E+00 | NOT IDENT. |
| BI-212  | 0.000E+00  | 7.358E-01 | 1.014E+00 | 0.000E+00 | FAIL ABUN  |
| RN-219  | -1.286E-01 | 3.086E-01 | 5.244E-01 | 0.000E+00 | FAIL ABUN  |
| RA-223  | 5.512E-02  | 5.860E-01 | 8.646E-01 | 0.000E+00 | FAIL ABUN  |
| AC-227  | -1.207E-01 | 2.136E-01 | 3.568E-01 | 0.000E+00 | FAIL ABUN  |
| TH-227  | -1.207E-01 | 2.137E-01 | 3.568E-01 | 0.000E+00 | FAIL ABUN  |
| TH-229  | -1.145E-01 | 4.439E-01 | 7.730E-01 | 0.000E+00 | FAIL ABUN  |
| PA-231  | 5.876E-01  | 1.239E+00 | 2.079E+00 | 0.000E+00 | FAIL ABUN  |
| TH-231  | 5.512E-02  | 5.860E-01 | 8.646E-01 | 0.000E+00 | FAIL ABUN  |
| PA-233  | -4.847E-02 | 5.499E-02 | 8.842E-02 | 0.000E+00 | FAIL ABUN  |
| PA-234  | -4.673E-02 | 2.529E-01 | 4.159E-01 | 0.000E+00 | NOT IDENT. |
| PA-234M | -1.927E-01 | 4.061E+00 | 6.726E+00 | 0.000E+00 | NOT IDENT. |
| TH-234  | 1.508E+00  | 1.478E+00 | 2.672E+00 | 0.000E+00 | FAIL ABUN  |
| U-235   | 6.043E-02  | 1.922E-01 | 3.235E-01 | 0.000E+00 | FAIL ABUN  |
| U-238   | 1.508E+00  | 1.478E+00 | 2.672E+00 | 0.000E+00 | FAIL ABUN  |
| NP-239  | -1.964E-01 | 3.602E-01 | 5.996E-01 | 0.000E+00 | FAIL ABUN  |
| AM-241  | 5.609E-02  | 1.661E-01 | 3.006E-01 | 0.000E+00 | NOT IDENT. |
| CM-247  | -2.190E-02 | 2.902E-02 | 4.701E-02 | 0.000E+00 | FAIL ABUN  |
| CF-249  | 8.011E-03  | 3.104E-02 | 5.487E-02 | 0.000E+00 | NOT IDENT. |

|        |            |           |           |                      |
|--------|------------|-----------|-----------|----------------------|
| CF-251 | -5.622E-03 | 1.114E-01 | 1.969E-01 | 0.000E+00 NOT IDENT. |
|--------|------------|-----------|-----------|----------------------|

VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 16:19:19.01

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                          *
*                               Charleston, SC 29414                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247970001.CNF;1
Sample date       : 23-FEB-2010 12:00:00 Acquisition date : 11-MAR-2010 14:18:08
Sample ID        : G247970001 Sample quantity   : 1.26980E+02 GRAM
Detector name    : GAM18 Detector geometry: CAN
Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:01.85 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity       : 5.00000
Batch ID        : 958216 Detector SN#       :
Matrix Spike ID  : LCS ID                  : 1032-A
*****

```

Nuclide Line Activity Report

Nuclide Type:

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected pCi/GRAM | Decay Corr pCi/GRAM | 2-Sigma %Error |
|---------|---------|-------|--------|-----------|----------------------|---------------------|----------------|
| K-40    | 1460.82 | 2623  | 10.66* | 1.894E+00 | 3.840E+01            | 3.840E+01           | 8.62           |
| CD-109  | 88.03   | 276   | 3.70*  | 6.450E+00 | 3.421E+00            | 3.505E+00           | 30.25          |
| SN-126  | 64.28   | ----- | 9.60   | 3.245E+00 | -----                | Line Not Found      | -----          |
|         | 86.94   | 276   | 8.90   | 6.450E+00 | 1.422E+00            | 1.422E+00           | 50.51          |
|         | 87.57   | 276   | 37.00* | 6.450E+00 | 3.421E-01            | 3.421E-01           | 30.25          |
| EU-155  | 86.55   | 276   | 30.70  | 6.450E+00 | 4.123E-01            | 4.150E-01           | 30.28          |
|         | 105.31  | 90    | 21.10* | 7.740E+00 | 1.637E-01            | 1.648E-01           | 70.13          |
| HG-203  | 70.83   | ----- | 3.69   | 4.309E+00 | -----                | Line Not Found      | -----          |
|         | 72.87   | ----- | 6.19   | 4.622E+00 | -----                | Line Not Found      | -----          |
|         | 279.20  | 80    | 81.56* | 6.250E+00 | 4.641E-02            | 5.900E-02           | 83.16          |
| TL-208  | 277.37  | 80    | 6.60   | 6.250E+00 | 5.735E-01            | 5.735E-01           | 83.63          |
|         | 583.19  | 682   | 85.00* | 3.935E+00 | 6.023E-01            | 6.023E-01           | 13.48          |
|         | 860.56  | 94    | 12.50  | 2.914E+00 | 7.666E-01            | 7.666E-01           | 66.79          |
| BI-211  | 72.87   | ----- | 1.23   | 4.622E+00 | -----                | Line Not Found      | -----          |
|         | 351.06  | 1050  | 12.92* | 5.452E+00 | 4.405E+00            | 4.405E+00           | 10.67          |
| PB-212  | 74.82   | 442   | 10.28  | 4.938E+00 | 2.576E+00            | 2.576E+00           | 23.37          |
|         | 77.11   | 808   | 17.10  | 5.257E+00 | 2.657E+00            | 2.657E+00           | 14.54          |
|         | 238.63  | 1902  | 43.60* | 6.793E+00 | 1.898E+00            | 1.898E+00           | 9.04           |
|         | 300.09  | 183   | 3.30   | 5.986E+00 | 2.742E+00            | 2.742E+00           | 37.85          |
| BI-214  | 609.32  | 698   | 45.49* | 3.814E+00 | 1.190E+00            | 1.190E+00           | 16.07          |
|         | 1120.29 | 166   | 14.92  | 2.335E+00 | 1.408E+00            | 1.408E+00           | 34.46          |
|         | 1764.49 | ----- | 15.30  | 1.694E+00 | -----                | Line Not Found      | -----          |
| PB-214  | 74.82   | 442   | 5.80   | 4.938E+00 | 4.566E+00            | 4.566E+00           | 22.68          |
|         | 77.11   | 808   | 9.70   | 5.257E+00 | 4.684E+00            | 4.684E+00           | 16.72          |
|         | 242.00  | 443   | 7.25   | 6.749E+00 | 2.679E+00            | 2.679E+00           | 24.67          |
|         | 295.22  | 616   | 18.42  | 6.041E+00 | 1.636E+00            | 1.636E+00           | 14.19          |
|         | 351.93  | 1050  | 35.60* | 5.452E+00 | 1.599E+00            | 1.599E+00           | 12.01          |
| RA-224  | 240.99  | 443   | 4.10*  | 6.749E+00 | 4.737E+00            | 4.737E+00           | 23.98          |
| RA-226  | 609.32  | 698   | 45.49* | 3.814E+00 | 1.190E+00            | 1.190E+00           | 16.07          |
|         | 1120.29 | 166   | 14.92  | 2.335E+00 | 1.408E+00            | 1.408E+00           | 34.46          |
|         | 1764.49 | ----- | 15.30  | 1.694E+00 | -----                | Line Not Found      | -----          |
| AC-228  | 338.32  | 409   | 11.27  | 5.582E+00 | 1.920E+00            | 1.920E+00           | 45.64          |

Nuclide Type:

| Nuclide | Energy | Area  | %Abn    | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|--------|-------|---------|-----------|-------------------------|------------------------|-------------------|
|         | 911.20 | 523   | 25.80*  | 2.781E+00 | 2.153E+00               | 2.153E+00              | 18.43             |
|         | 968.97 | 207   | 15.80   | 2.640E+00 | 1.470E+00               | 1.470E+00              | 36.13             |
| RA-228  | 338.32 | 409   | 11.27   | 5.582E+00 | 1.920E+00               | 1.920E+00              | 45.64             |
|         | 911.20 | 523   | 25.80*  | 2.781E+00 | 2.153E+00               | 2.153E+00              | 18.43             |
|         | 968.97 | 207   | 15.80   | 2.640E+00 | 1.470E+00               | 1.470E+00              | 36.13             |
| TH-228  | 74.82  | 442   | 10.28   | 4.938E+00 | 2.576E+00               | 2.576E+00              | 21.28             |
|         | 77.11  | 808   | 17.10   | 5.257E+00 | 2.657E+00               | 2.657E+00              | 14.54             |
|         | 238.63 | 1902  | 43.60*  | 6.793E+00 | 1.898E+00               | 1.898E+00              | 9.04              |
|         | 300.09 | 183   | 3.30    | 5.986E+00 | 2.742E+00               | 2.742E+00              | 71.19             |
| TH-232  | 338.32 | 409   | 11.27   | 5.582E+00 | 1.920E+00               | 1.920E+00              | 20.41             |
|         | 911.20 | 523   | 25.80*  | 2.781E+00 | 2.153E+00               | 2.153E+00              | 18.43             |
|         | 968.97 | 207   | 15.80   | 2.640E+00 | 1.470E+00               | 1.470E+00              | 36.13             |
| NP-237  | 86.48  | 276   | 12.40*  | 6.450E+00 | 1.021E+00               | 1.021E+00              | 36.81             |
|         | 95.86  | ----- | 2.68    | 7.180E+00 | -----                   | Line Not Found         | -----             |
| ANH-511 | 511.00 | 234   | 100.00* | 4.312E+00 | 1.604E-01               | 1.604E-01              | 33.05             |

Flag: "\*" = Keyline

Summary of Nuclide Activity  
Sample ID : G247970001

Page : 3  
Acquisition date : 11-MAR-2010 14:18:08

Total number of lines in spectrum 33  
Number of unidentified lines 7  
Number of lines tentatively identified by NID 26 78.79%

Nuclide Type :

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|-------------------------|------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.25E+09Y | 1.00  | 3.840E+01               | 3.840E+01              | 0.331E+01                   | 8.62              |       |
| CD-109           | 461.40D   | 1.02  | 3.421E+00               | 3.505E+00              | 1.060E+00                   | 30.25             |       |
| SN-126           | 2.30E+05Y | 1.00  | 3.421E-01               | 3.421E-01              | 1.035E-01                   | 30.25             |       |
| EU-155           | 4.75Y     | 1.01  | 1.637E-01               | 1.648E-01              | 1.156E-01                   | 70.13             |       |
| HG-203           | 46.59D    | 1.27  | 4.641E-02               | 5.900E-02              | 4.907E-02                   | 83.16             |       |
| TL-208           | 1.41E+10Y | 1.00  | 6.023E-01               | 6.023E-01              | 0.812E-01                   | 13.48             |       |
| BI-211           | 7.04E+08Y | 1.00  | 4.405E+00               | 4.405E+00              | 0.470E+00                   | 10.67             |       |
| PB-212           | 1.41E+10Y | 1.00  | 1.898E+00               | 1.898E+00              | 0.172E+00                   | 9.04              |       |
| BI-214           | 1600.00Y  | 1.00  | 1.190E+00               | 1.190E+00              | 0.191E+00                   | 16.07             |       |
| PB-214           | 1600.00Y  | 1.00  | 1.599E+00               | 1.599E+00              | 0.192E+00                   | 12.01             |       |
| RA-224           | 1.41E+10Y | 1.00  | 4.737E+00               | 4.737E+00              | 1.136E+00                   | 23.98             |       |
| RA-226           | 1600.00Y  | 1.00  | 1.190E+00               | 1.190E+00              | 0.191E+00                   | 16.07             |       |
| AC-228           | 1.41E+10Y | 1.00  | 2.153E+00               | 2.153E+00              | 0.397E+00                   | 18.43             |       |
| RA-228           | 1.41E+10Y | 1.00  | 2.153E+00               | 2.153E+00              | 0.397E+00                   | 18.43             |       |
| TH-228           | 1.41E+10Y | 1.00  | 1.898E+00               | 1.898E+00              | 0.172E+00                   | 9.04              |       |
| TH-232           | 1.41E+10Y | 1.00  | 2.153E+00               | 2.153E+00              | 0.397E+00                   | 18.43             |       |
| NP-237           | 2.14E+06Y | 1.00  | 1.021E+00               | 1.021E+00              | 0.376E+00                   | 36.81             |       |
| ANH-511          | 1.00E+09Y | 1.00  | 1.604E-01               | 1.604E-01              | 0.530E-01                   | 33.05             |       |
| Total Activity : |           |       | 6.754E+01               | 6.763E+01              |                             |                   |       |

Grand Total Activity : 6.754E+01 6.763E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit



Unidentified Energy Lines  
Sample ID : G247970001

Page : 4  
Acquisition date : 11-MAR-2010 14:18:08

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 93.10   | 291  | 601   | 1.36 | 185.31  | 182  | 9  | 4.04E-02 | 34.0 | 6.97E+00 | T     |
| 0  | 129.09  | 94   | 335   | 1.23 | 257.25  | 255  | 7  | 1.31E-02 | 67.6 | 8.25E+00 |       |
| 0  | 185.95  | 285  | 453   | 1.20 | 370.94  | 365  | 12 | 3.96E-02 | 33.4 | 7.65E+00 | T     |
| 0  | 209.22  | 179  | 357   | 0.97 | 417.47  | 413  | 9  | 2.49E-02 | 40.9 | 7.26E+00 |       |
| 0  | 269.84  | 146  | 232   | 1.84 | 538.67  | 534  | 9  | 2.02E-02 | 41.2 | 6.36E+00 | T     |
| 0  | 327.77  | 134  | 253   | 1.46 | 654.48  | 649  | 12 | 1.86E-02 | 50.4 | 5.69E+00 | T     |
| 0  | 409.26  | 89   | 189   | 1.88 | 817.42  | 813  | 11 | 1.24E-02 | 63.0 | 4.97E+00 |       |
| 0  | 463.68  | 100  | 196   | 1.18 | 926.22  | 918  | 13 | 1.38E-02 | 61.5 | 4.59E+00 | T     |
| 0  | 726.85  | 176  | 112   | 1.45 | 1452.42 | 1445 | 14 | 2.45E-02 | 29.6 | 3.34E+00 | T     |
| 0  | 767.94  | 115  | 103   | 1.86 | 1534.58 | 1528 | 14 | 1.60E-02 | 41.6 | 3.20E+00 |       |
| 0  | 795.14  | 81   | 118   | 1.51 | 1588.97 | 1581 | 14 | 1.13E-02 | 61.1 | 3.11E+00 | T     |
| 0  | 1376.77 | 71   | 32    | 2.30 | 2752.03 | 2747 | 12 | 9.80E-03 | 40.3 | 1.98E+00 |       |
| 0  | 1587.83 | 33   | 48    | 1.98 | 3174.12 | 3163 | 16 | 4.58E-03 | ***  | 1.79E+00 |       |
| 0  | 1762.80 | 151  | 19    | 2.45 | 3524.06 | 3514 | 23 | 2.10E-02 | 21.7 | 1.70E+00 |       |

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC
*                                     2040 Savage Road
*                                     Charleston, SC 29414
*****
*
*                               DETECTOR DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G247970001.CNF;1
* Acquisition date   : 11-MAR-2010 14:18:08   Detector SN#      :
* Detector ID        : GAM18                  Sensitivity         : 5.00000
* Geometry           : CAN                    Energy tolerance: 1.50000
* Elapsed live time  : 0 02:00:00.00          Abundance limit  : 75.00000
* Elapsed real time  : 0 02:00:01.85          Half life ratio  : 8.00000
*****
*
*                               SAMPLE DATA
*
* Sample date        : 23-FEB-2010 12:00:00   Nuclide Library : SOLID
* Sample ID          : G247970001            Analyst initials: MXR1
* Batch Number       : 958216                Sample Quantity : 1.26980E+02 GRAM
*****
*
*                               QC DATA
*
* CALIB. DATE/TIME   : 23-APR-2009 11:59:23.2MS Isotope      :
* MSD ID             :                      MSD Isotope      :
* LCS ID             : 1032-A               LCS Isotope      :
*****

```

## Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| K-40    | 3.840E+01              | 3.309E+00 | 4.322E-01         | 3.280E-02 | 88.847  |
| CD-109  | 3.505E+00              | 1.060E+00 | 1.466E+00         | 1.355E-01 | 2.391   |
| SN-126  | 3.421E-01              | 1.035E-01 | 1.424E-01         | 1.312E-02 | 2.403   |
| EU-155  | 1.648E-01              | 1.156E-01 | 1.540E-01         | 1.100E-02 | 1.070   |
| HG-203  | 5.900E-02              | 4.907E-02 | 5.372E-02         | 3.239E-03 | 1.098   |
| TL-208  | 6.023E-01              | 8.120E-02 | 4.493E-02         | 3.516E-03 | 13.406  |
| BI-211  | 4.405E+00              | 4.701E-01 | 2.756E-01         | 1.770E-02 | 15.984  |
| PB-212  | 1.898E+00              | 1.716E-01 | 7.869E-02         | 5.672E-03 | 24.125  |
| BI-214  | 1.190E+00              | 1.912E-01 | 1.061E-01         | 9.537E-03 | 11.213  |
| PB-214  | 1.599E+00              | 1.921E-01 | 9.875E-02         | 8.358E-03 | 16.191  |
| RA-224  | 4.737E+00              | 1.136E+00 | 8.424E-01         | 4.693E-02 | 5.623   |
| RA-226  | 1.190E+00              | 1.912E-01 | 1.061E-01         | 9.537E-03 | 11.213  |
| AC-228  | 2.153E+00              | 3.967E-01 | 1.711E-01         | 2.318E-02 | 12.580  |
| RA-228  | 2.153E+00              | 3.967E-01 | 1.711E-01         | 2.318E-02 | 12.580  |
| TH-228  | 1.898E+00              | 1.716E-01 | 7.869E-02         | 5.672E-03 | 24.125  |
| TH-232  | 2.153E+00              | 3.967E-01 | 1.711E-01         | 2.318E-02 | 12.580  |
| NP-237  | 1.021E+00              | 3.757E-01 | 4.110E-01         | 9.399E-02 | 2.484   |
| ANH-511 | 1.604E-01              | 5.300E-02 | 3.953E-02         | 2.610E-03 | 4.057   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| BE-7    | -1.650E-02                         |              | 2.578E-01 | 4.236E-01         | 3.068E-02 | -0.039  |
| NA-22   | -1.619E-02                         |              | 4.235E-02 | 6.770E-02         | 4.606E-03 | -0.239  |
| NA-24   | -9.629E-01                         |              | 1.023E+00 | Half-Life         | too short |         |
| SC-46   | -2.067E-03                         |              | 3.257E-02 | 5.297E-02         | 5.909E-03 | -0.039  |
| V-48    | 5.960E-02                          |              | 6.445E-02 | 1.110E-01         | 1.097E-02 | 0.537   |
| CR-51   | 1.611E-01                          |              | 3.188E-01 | 5.267E-01         | 3.386E-02 | 0.306   |
| MN-54   | 5.489E-03                          |              | 3.418E-02 | 5.671E-02         | 5.809E-03 | 0.097   |
| CO-56   | -3.111E-02                         |              | 3.596E-02 | 5.538E-02         | 5.782E-03 | -0.562  |
| CO-57   | 2.055E-02                          |              | 2.409E-02 | 3.991E-02         | 2.364E-03 | 0.515   |
| CO-58   | 4.912E-04                          |              | 3.456E-02 | 5.702E-02         | 5.629E-03 | 0.009   |
| FE-59   | -5.730E-02                         |              | 7.854E-02 | 1.238E-01         | 1.019E-02 | -0.463  |
| CO-60   | 2.265E-02                          |              | 3.119E-02 | 5.437E-02         | 4.108E-03 | 0.417   |
| ZN-65   | 1.160E-01                          |              | 9.651E-02 | 1.510E-01         | 1.064E-02 | 0.768   |
| SE-75   | 3.244E-02                          |              | 4.275E-02 | 6.415E-02         | 3.670E-03 | 0.506   |
| SR-85   | 7.248E-02                          |              | 3.884E-02 | 6.187E-02         | 4.099E-03 | 1.172   |
| Y-88    | -1.818E-03                         |              | 2.695E-02 | 4.370E-02         | 2.489E-03 | -0.042  |
| Y-91    | -1.066E+01                         |              | 1.968E+01 | 3.135E+01         | 1.853E+00 | -0.340  |
| NB-94   | -7.209E-03                         |              | 2.948E-02 | 4.853E-02         | 3.982E-03 | -0.149  |
| NB-95   | 7.099E-02                          |              | 4.208E-02 | 6.756E-02         | 6.180E-03 | 1.051   |
| NB-95M  | 1.994E-01                          |              | 1.251E-01 | 1.945E-01         | 1.432E-02 | 1.026   |
| ZR-95   | 4.663E-02                          |              | 6.287E-02 | 1.086E-01         | 1.073E-02 | 0.429   |
| MO-99   | 7.459E+00                          |              | 1.376E+01 | 2.272E+01         | 3.595E+00 | 0.328   |
| TC-99M  | -6.583E+10                         |              | 2.737E+11 | Half-Life         | too short |         |
| RU-103  | -1.574E-02                         |              | 3.289E-02 | 5.239E-02         | 6.691E-03 | -0.300  |
| RH-106  | -5.015E-02                         |              | 2.743E-01 | 4.367E-01         | 5.448E-02 | -0.115  |
| RU-106  | -5.015E-02                         |              | 2.742E-01 | 4.367E-01         | 3.214E-02 | -0.115  |
| AG-108M | -1.468E-02                         |              | 2.450E-02 | 3.938E-02         | 2.539E-03 | -0.373  |
| AG-110M | -1.979E-02                         |              | 2.776E-02 | 4.447E-02         | 3.508E-03 | -0.445  |
| SN-113  | 2.568E-03                          |              | 3.616E-02 | 6.081E-02         | 3.730E-03 | 0.042   |
| CD-115  | 1.285E+01                          |              | 1.275E+01 | 2.207E+01         | 1.484E+00 | 0.582   |
| SN-117M | 2.226E-02                          |              | 4.973E-02 | 8.551E-02         | 4.545E-03 | 0.260   |
| TE-123M | 7.485E-03                          |              | 2.473E-02 | 4.231E-02         | 2.283E-03 | 0.177   |
| SB-124  | -6.787E-03                         |              | 6.059E-02 | 9.849E-02         | 6.821E-03 | -0.069  |
| SB-125  | 4.206E-02                          |              | 7.567E-02 | 1.295E-01         | 8.080E-03 | 0.325   |
| TE-125M | 5.704E+00                          |              | 1.032E+01 | 1.527E+01         | 1.370E+00 | 0.373   |
| I-126   | 2.435E-01                          |              | 1.934E-01 | 3.454E-01         | 2.655E-02 | 0.705   |
| SB-126  | -2.069E-02                         |              | 1.417E-01 | 2.005E-01         | 1.698E-02 | -0.103  |
| SB-127  | -4.515E-01                         |              | 1.307E+00 | 2.139E+00         | 2.392E-01 | -0.211  |
| I-131   | -7.125E-02                         |              | 1.053E-01 | 1.716E-01         | 1.108E-02 | -0.415  |
| TE-132  | 3.941E-01                          |              | 8.080E-01 | 1.357E+00         | 1.979E-01 | 0.290   |
| BA-133  | -2.495E-02                         |              | 4.141E-02 | 5.475E-02         | 6.169E-03 | -0.456  |
| I-133   | -4.825E-03                         |              | 5.488E-03 | Half-Life         | too short |         |
| CS-134  | 1.019E-01                          | +            | 6.304E-02 | 7.919E-02         | 7.659E-03 | 1.286   |
| CS-135  | 1.810E-01                          |              | 1.511E-01 | 2.310E-01         | 1.746E-02 | 0.784   |
| I-135   | -3.379E+10                         |              | 3.681E+10 | Half-Life         | too short |         |
| CS-136  | 2.368E-02                          |              | 9.853E-02 | 1.673E-01         | 1.500E-02 | 0.142   |
| BA-137M | -1.301E-02                         |              | 2.939E-02 | 4.802E-02         | 3.660E-03 | -0.271  |
| CS-137  | -1.374E-02                         |              | 3.105E-02 | 5.072E-02         | 3.876E-03 | -0.271  |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| CE-139  | 1.246E-02                          |              | 2.595E-02 | 4.455E-02           | 2.338E-03 | 0.280   |
| BA-140  | -1.578E-01                         |              | 2.531E-01 | 3.889E-01           | 1.303E-01 | -0.406  |
| LA-140  | -7.238E-02                         |              | 7.427E-02 | 9.674E-02           | 6.638E-03 | -0.748  |
| CE-141  | 3.119E-02                          |              | 6.188E-02 | 9.941E-02           | 5.676E-03 | 0.314   |
| CE-143  | 1.382E-03                          |              | 1.856E-04 | Half-Life too short |           |         |
| CE-144  | 2.435E-02                          |              | 2.066E-01 | 2.948E-01           | 4.077E-02 | 0.083   |
| PM-144  | -3.714E-03                         |              | 3.062E-02 | 5.081E-02           | 4.125E-03 | -0.073  |
| PR-144  | -2.728E-01                         |              | 2.293E+00 | 3.806E+00           | 3.089E-01 | -0.072  |
| PM-146  | 2.759E-02                          |              | 3.440E-02 | 5.932E-02           | 5.182E-03 | 0.465   |
| ND-147  | -3.447E-01                         |              | 5.070E-01 | 7.903E-01           | 1.103E-01 | -0.436  |
| PM-149  | -4.716E+01                         |              | 1.060E+02 | 1.682E+02           | 2.379E+01 | -0.280  |
| EU-152  | -6.314E-02                         |              | 8.863E-02 | 1.243E-01           | 8.106E-03 | -0.508  |
| GD-153  | -7.110E-02                         |              | 9.514E-02 | 1.309E-01           | 1.023E-02 | -0.543  |
| EU-154  | -1.991E-02                         |              | 1.184E-01 | 1.921E-01           | 1.933E-02 | -0.104  |
| TB-160  | 4.201E-02                          |              | 1.189E-01 | 1.993E-01           | 2.190E-02 | 0.211   |
| HO-166M | 2.344E-03                          |              | 4.991E-02 | 8.346E-02           | 6.956E-03 | 0.028   |
| TA-182  | -6.317E-03                         |              | 1.911E-01 | 3.146E-01           | 1.924E-02 | -0.020  |
| IR-192  | 1.054E-02                          |              | 3.005E-02 | 4.930E-02           | 2.859E-03 | 0.214   |
| BI-207  | 3.558E-02                          |              | 4.568E-02 | 8.002E-02           | 6.605E-03 | 0.445   |
| PB-210  | -1.382E-01                         |              | 5.151E+00 | 8.538E+00           | 6.545E-01 | -0.016  |
| PB-211  | -2.608E-01                         |              | 6.355E-01 | 8.757E-01           | 4.201E-01 | -0.298  |
| BI-212  | 2.338E+00                          | +            | 7.508E-01 | 1.004E+00           | 1.247E-01 | 2.329   |
| RN-219  | -1.286E-01                         |              | 3.149E-01 | 5.145E-01           | 6.917E-02 | -0.250  |
| RA-223  | 5.512E-02                          |              | 5.980E-01 | 8.455E-01           | 1.362E-01 | 0.065   |
| AC-227  | -1.207E-01                         |              | 2.179E-01 | 3.478E-01           | 3.523E-02 | -0.347  |
| TH-227  | -1.207E-01                         |              | 2.181E-01 | 3.478E-01           | 4.151E-02 | -0.347  |
| TH-229  | -1.145E-01                         |              | 4.529E-01 | 7.503E-01           | 4.017E-02 | -0.153  |
| PA-231  | 5.876E-01                          |              | 1.264E+00 | 2.029E+00           | 2.654E-01 | 0.290   |
| TH-231  | 5.512E-02                          |              | 5.980E-01 | 8.455E-01           | 1.362E-01 | 0.065   |
| PA-233  | -4.847E-02                         |              | 5.612E-02 | 8.642E-02           | 5.295E-03 | -0.561  |
| PA-234  | -4.673E-02                         |              | 2.580E-01 | 4.133E-01           | 8.153E-02 | -0.113  |
| PA-234M | -1.927E-01                         |              | 4.144E+00 | 6.689E+00           | 7.216E-01 | -0.029  |
| TH-234  | 1.508E+00                          |              | 1.508E+00 | 2.553E+00           | 4.598E-01 | 0.591   |
| U-235   | 6.043E-02                          |              | 1.961E-01 | 3.127E-01           | 4.877E-02 | 0.193   |
| U-238   | 1.508E+00                          |              | 1.508E+00 | 2.553E+00           | 4.598E-01 | 0.591   |
| NP-239  | -1.964E-01                         |              | 3.675E-01 | 5.779E-01           | 3.569E-02 | -0.340  |
| AM-241  | 5.609E-02                          |              | 1.695E-01 | 2.869E-01           | 2.380E-02 | 0.195   |
| CM-247  | -2.190E-02                         |              | 2.962E-02 | 4.612E-02           | 2.685E-03 | -0.475  |
| CF-249  | 8.011E-03                          |              | 3.168E-02 | 5.380E-02           | 3.093E-03 | 0.149   |
| CF-251  | -5.622E-03                         |              | 1.137E-01 | 1.909E-01           | 1.009E-02 | -0.029  |

# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*                                     DETECTOR DATA                          *
*
* Configuration      : SYS$SYSROOT:[ALPHA.ARCHIVE.GAMMA]G247970001          *
* Acquisition date   : 11-MAR-2010 14:18:08 Detector SN#      :              *
* Detector ID        : GAM18                      Sensitivity   : 5.000        *
* Geometry           : CAN                        Energy tolerance: 1.500        *
* Elapsed live time  : 0 02:00:00.00             Abundance limit : 75.000        *
* Elapsed real time  : 0 02:00:01.85             Half life ratio : 8.000        *
*****
*                                     SAMPLE DATA                            *
*
* Sample date        : 23-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID          : G247970001             Analyst initials: MXR1          *
* Batch Number       : 958216                  Sample Quantity : 1.2698E+02 GRAM *
* Recovery           : 1.00000                 Carrier Weight  : 0.00000        *
*****
*                                     QC DATA                               *
*
* CALIB. DATE/TIME   : 23-APR-2009 11:59:23 MS Isotope       :              *
* MSD DPM             : 0.000                     MSD Isotope   :              *
* LCS DPM             : 0.000                     LCS Isotope    :              *
* LCSD DPM            : 0.000                     LCSD Isotope   :              *
*****

```

## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act Error | DLC<br>(pCi/GRAM ) | TPU       |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.840E+01               | 3.243E+00 | 2.162E-01          | 1.655E+00 |
| CD-109  | 3.505E+00               | 1.039E+00 | 7.642E-01          | 5.302E-01 |
| SN-126  | 3.421E-01               | 1.014E-01 | 7.422E-02          | 5.175E-02 |
| EU-155  | 1.648E-01               | 1.133E-01 | 8.008E-02          | 5.778E-02 |
| HG-203  | 5.900E-02               | 4.809E-02 | 2.754E-02          | 2.453E-02 |
| TL-208  | 6.023E-01               | 7.958E-02 | 2.279E-02          | 4.060E-02 |
| BI-211  | 4.405E+00               | 4.607E-01 | 1.408E-01          | 2.350E-01 |
| PB-212  | 1.898E+00               | 1.681E-01 | 4.043E-02          | 8.578E-02 |
| BI-214  | 1.190E+00               | 1.874E-01 | 5.378E-02          | 9.562E-02 |
| PB-214  | 1.599E+00               | 1.882E-01 | 5.046E-02          | 9.603E-02 |
| RA-224  | 4.737E+00               | 1.113E+00 | 4.328E-01          | 5.680E-01 |
| RA-226  | 1.190E+00               | 1.874E-01 | 5.378E-02          | 9.562E-02 |
| AC-228  | 2.153E+00               | 3.888E-01 | 8.622E-02          | 1.984E-01 |
| RA-228  | 2.153E+00               | 3.888E-01 | 8.622E-02          | 1.984E-01 |
| TH-228  | 1.898E+00               | 1.681E-01 | 4.043E-02          | 8.578E-02 |
| TH-232  | 2.153E+00               | 3.888E-01 | 8.622E-02          | 1.984E-01 |
| NP-237  | 1.021E+00               | 3.682E-01 | 2.143E-01          | 1.879E-01 |
| ANH-511 | 1.604E-01               | 5.194E-02 | 2.009E-02          | 2.650E-02 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act error | DLC<br>(pCi/GRAM ) | TPU                  |
|---------|-------------------------------------|---------------|--------------------|----------------------|
| BE-7    | -1.650E-02                          | 2.527E-01     | 2.155E-01          | 1.289E-01 NOT IDENT. |
| NA-22   | -1.619E-02                          | 4.150E-02     | 3.393E-02          | 2.118E-02 NOT IDENT. |
| NA-24   | -9.629E+05                          | 2.005E+06     | 0.000E+00          | 1.023E+06 SHORT HLIF |
| SC-46   | -2.067E-03                          | 3.192E-02     | 2.670E-02          | 1.628E-02 FAIL ABUN  |
| V-48    | 5.960E-02                           | 6.316E-02     | 5.583E-02          | 3.222E-02 NOT IDENT. |
| CR-51   | 1.611E-01                           | 3.125E-01     | 2.695E-01          | 1.594E-01 NOT IDENT. |
| MN-54   | 5.489E-03                           | 3.349E-02     | 2.861E-02          | 1.709E-02 NOT IDENT. |
| CO-56   | -3.111E-02                          | 3.524E-02     | 2.793E-02          | 1.798E-02 NOT IDENT. |
| CO-57   | 2.055E-02                           | 2.361E-02     | 2.071E-02          | 1.204E-02 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CO-58   | 4.912E-04  | 3.387E-02 | 2.878E-02 | 1.728E-02 | NOT IDENT. |
| FE-59   | -5.730E-02 | 7.697E-02 | 6.220E-02 | 3.927E-02 | NOT IDENT. |
| CO-60   | 2.265E-02  | 3.057E-02 | 2.723E-02 | 1.560E-02 | NOT IDENT. |
| ZN-65   | 1.160E-01  | 9.458E-02 | 7.586E-02 | 4.826E-02 | NOT IDENT. |
| SE-75   | 3.244E-02  | 4.190E-02 | 3.291E-02 | 2.138E-02 | NOT IDENT. |
| SR-85   | 7.248E-02  | 3.806E-02 | 3.144E-02 | 1.942E-02 | NOT IDENT. |
| Y-88    | -1.818E-03 | 2.641E-02 | 2.178E-02 | 1.348E-02 | NOT IDENT. |
| Y-91    | -1.066E+01 | 1.928E+01 | 1.572E+01 | 9.839E+00 | NOT IDENT. |
| NB-94   | -7.209E-03 | 2.889E-02 | 2.454E-02 | 1.474E-02 | NOT IDENT. |
| NB-95   | 7.099E-02  | 4.124E-02 | 3.413E-02 | 2.104E-02 | NOT IDENT. |
| NB-95M  | 1.994E-01  | 1.226E-01 | 9.995E-02 | 6.255E-02 | NOT IDENT. |
| ZR-95   | 4.663E-02  | 6.161E-02 | 5.488E-02 | 3.143E-02 | NOT IDENT. |
| MO-99   | 7.459E+00  | 1.348E+01 | 1.148E+01 | 6.879E+00 | NOT IDENT. |
| TC-99M  | -6.583E+16 | 5.365E+17 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | -1.574E-02 | 3.223E-02 | 2.663E-02 | 1.645E-02 | FAIL ABUN  |
| RH-106  | -5.015E-02 | 2.688E-01 | 2.213E-01 | 1.371E-01 | NOT IDENT. |
| RU-106  | -5.015E-02 | 2.687E-01 | 2.213E-01 | 1.371E-01 | NOT IDENT. |
| AG-108M | -1.468E-02 | 2.401E-02 | 2.006E-02 | 1.225E-02 | NOT IDENT. |
| AG-110M | -1.979E-02 | 2.720E-02 | 2.252E-02 | 1.388E-02 | NOT IDENT. |
| SN-113  | 2.568E-03  | 3.544E-02 | 3.102E-02 | 1.808E-02 | NOT IDENT. |
| CD-115  | 1.285E+01  | 1.250E+01 | 1.121E+01 | 6.376E+00 | NOT IDENT. |
| SN-117M | 2.226E-02  | 4.873E-02 | 4.420E-02 | 2.486E-02 | NOT IDENT. |
| TE-123M | 7.485E-03  | 2.423E-02 | 2.187E-02 | 1.236E-02 | NOT IDENT. |
| SB-124  | -6.787E-03 | 5.938E-02 | 4.915E-02 | 3.030E-02 | NOT IDENT. |
| SB-125  | 4.206E-02  | 7.416E-02 | 6.596E-02 | 3.784E-02 | FAIL ABUN  |
| TE-125M | 5.704E+00  | 1.011E+01 | 7.937E+00 | 5.159E+00 | NOT IDENT. |
| I-126   | 2.435E-01  | 1.895E-01 | 1.748E-01 | 9.669E-02 | NOT IDENT. |
| SB-126  | -2.069E-02 | 1.388E-01 | 1.013E-01 | 7.084E-02 | NOT IDENT. |
| SB-127  | -4.515E-01 | 1.281E+00 | 1.082E+00 | 6.535E-02 | NOT IDENT. |
| I-131   | -7.125E-02 | 1.032E-01 | 8.761E-02 | 5.265E-02 | NOT IDENT. |
| TE-132  | 3.941E-01  | 7.918E-01 | 6.979E-01 | 4.040E-01 | NOT IDENT. |
| BA-133  | -2.495E-02 | 4.058E-02 | 2.797E-02 | 2.071E-02 | NOT IDENT. |
| I-133   | -4.825E+03 | 1.076E+04 | 0.000E+00 | 5.488E+03 | SHORT HLIF |
| CS-134  | 1.019E-01  | 6.178E-02 | 3.997E-02 | 3.152E-02 | FAIL ABUN  |
| CS-135  | 1.810E-01  | 1.481E-01 | 1.185E-01 | 7.556E-02 | NOT IDENT. |
| I-135   | -3.379E+16 | 7.214E+16 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | 2.368E-02  | 9.656E-02 | 8.412E-02 | 4.926E-02 | NOT IDENT. |
| BA-137M | -1.301E-02 | 2.880E-02 | 2.431E-02 | 1.470E-02 | NOT IDENT. |
| CS-137  | -1.374E-02 | 3.043E-02 | 2.568E-02 | 1.553E-02 | NOT IDENT. |
| CE-139  | 1.246E-02  | 2.543E-02 | 2.301E-02 | 1.297E-02 | NOT IDENT. |
| BA-140  | -1.578E-01 | 2.480E-01 | 1.975E-01 | 1.265E-01 | NOT IDENT. |
| LA-140  | -7.238E-02 | 7.279E-02 | 4.832E-02 | 3.714E-02 | FAIL ABUN  |
| CE-141  | 3.119E-02  | 6.064E-02 | 5.145E-02 | 3.094E-02 | NOT IDENT. |
| CE-143  | 1.382E+03  | 3.639E+02 | 0.000E+00 | 1.856E+02 | SHORT HLIF |
| CE-144  | 2.435E-02  | 2.024E-01 | 1.528E-01 | 1.033E-01 | NOT IDENT. |
| PM-144  | -3.714E-03 | 3.001E-02 | 2.570E-02 | 1.531E-02 | NOT IDENT. |
| PR-144  | -2.728E-01 | 2.247E+00 | 1.925E+00 | 1.147E+00 | NOT IDENT. |
| PM-146  | 2.759E-02  | 3.371E-02 | 3.020E-02 | 1.720E-02 | NOT IDENT. |
| ND-147  | -3.447E-01 | 4.969E-01 | 4.014E-01 | 2.535E-01 | NOT IDENT. |
| PM-149  | -4.716E+01 | 1.039E+02 | 8.620E+01 | 5.300E+01 | NOT IDENT. |
| EU-152  | -6.314E-02 | 8.686E-02 | 6.354E-02 | 4.432E-02 | NOT IDENT. |
| GD-153  | -7.110E-02 | 9.324E-02 | 6.813E-02 | 4.757E-02 | NOT IDENT. |
| EU-154  | -1.991E-02 | 1.160E-01 | 9.627E-02 | 5.918E-02 | NOT IDENT. |
| TB-160  | 4.201E-02  | 1.165E-01 | 1.005E-01 | 5.946E-02 | FAIL ABUN  |
| HO-166M | 2.344E-03  | 4.891E-02 | 4.220E-02 | 2.495E-02 | NOT IDENT. |
| TA-182  | -6.317E-03 | 1.873E-01 | 1.578E-01 | 9.557E-02 | NOT IDENT. |
| IR-192  | 1.054E-02  | 2.945E-02 | 2.523E-02 | 1.502E-02 | FAIL ABUN  |
| BI-207  | 3.558E-02  | 4.477E-02 | 4.022E-02 | 2.284E-02 | FAIL ABUN  |
| PB-210  | -1.382E-01 | 5.048E+00 | 4.490E+00 | 2.575E+00 | NOT IDENT. |
| PB-211  | -2.608E-01 | 6.228E-01 | 4.465E-01 | 3.178E-01 | NOT IDENT. |
| BI-212  | 2.338E+00  | 7.358E-01 | 5.074E-01 | 3.754E-01 | FAIL ABUN  |
| RN-219  | -1.286E-01 | 3.086E-01 | 2.624E-01 | 1.575E-01 | FAIL ABUN  |
| RA-223  | 5.512E-02  | 5.860E-01 | 4.326E-01 | 2.990E-01 | FAIL ABUN  |
| AC-227  | -1.207E-01 | 2.136E-01 | 1.785E-01 | 1.090E-01 | FAIL ABUN  |
| TH-227  | -1.207E-01 | 2.137E-01 | 1.785E-01 | 1.090E-01 | FAIL ABUN  |
| TH-229  | -1.145E-01 | 4.439E-01 | 3.867E-01 | 2.265E-01 | FAIL ABUN  |
| PA-231  | 5.876E-01  | 1.239E+00 | 1.040E+00 | 6.320E-01 | FAIL ABUN  |
| TH-231  | 5.512E-02  | 5.860E-01 | 4.326E-01 | 2.990E-01 | FAIL ABUN  |
| PA-233  | -4.847E-02 | 5.499E-02 | 4.423E-02 | 2.806E-02 | FAIL ABUN  |
| PA-234  | -4.673E-02 | 2.529E-01 | 2.081E-01 | 1.290E-01 | NOT IDENT. |
| PA-234M | -1.927E-01 | 4.061E+00 | 3.365E+00 | 2.072E+00 | NOT IDENT. |
| TH-234  | 1.508E+00  | 1.478E+00 | 1.337E+00 | 7.542E-01 | FAIL ABUN  |
| U-235   | 6.043E-02  | 1.922E-01 | 1.619E-01 | 9.805E-02 | FAIL ABUN  |
| U-238   | 1.508E+00  | 1.478E+00 | 1.337E+00 | 7.542E-01 | FAIL ABUN  |
| NP-239  | -1.964E-01 | 3.602E-01 | 3.000E-01 | 1.838E-01 | FAIL ABUN  |
| AM-241  | 5.609E-02  | 1.661E-01 | 1.504E-01 | 8.476E-02 | NOT IDENT. |
| CM-247  | -2.190E-02 | 2.902E-02 | 2.352E-02 | 1.481E-02 | FAIL ABUN  |
| CF-249  | 8.011E-03  | 3.104E-02 | 2.745E-02 | 1.584E-02 | NOT IDENT. |

|        |            |           |           |                      |
|--------|------------|-----------|-----------|----------------------|
| CF-251 | -5.622E-03 | 1.114E-01 | 9.851E-02 | 5.685E-02 NOT IDENT. |
|--------|------------|-----------|-----------|----------------------|

\*\*\*\*\*  
 \* GEL Laboratories LLC \*  
 \* 2040 SAVAGE ROAD \*  
 \* CHARLESTON ,SC 29417 \*  
 \* GAMMA SPECTROSCOPY BACKGROUND REPORT \*  
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| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 313.7121   |
| 49.72  | 335.7645   |
| 57.36  | 0.0000     |
| 59.54  | 323.1761   |
| 63.29  | 357.5583   |
| 63.29  | 357.5583   |
| 64.28  | 384.3018   |
| 67.75  | 389.6359   |
| 69.67  | 469.2690   |
| 70.83  | 446.6061   |
| 72.81  | 417.2368   |
| 72.87  | 417.3132   |
| 72.87  | 417.3132   |
| 74.82  | 426.6195   |
| 74.82  | 426.6195   |
| 74.82  | 426.6195   |
| 74.97  | 426.8102   |
| 77.11  | 429.5113   |
| 77.11  | 429.5113   |
| 77.11  | 429.5113   |
| 79.69  | 419.8180   |
| 79.80  | 411.0141   |
| 80.12  | 411.3889   |
| 80.19  | 411.4689   |
| 80.57  | 446.2393   |
| 81.00  | 512.5269   |
| 81.07  | 512.6289   |
| 81.07  | 512.6289   |
| 83.79  | 402.0726   |
| 83.79  | 402.0726   |
| 85.43  | 465.8937   |
| 86.48  | 556.7132   |
| 86.55  | 556.8196   |
| 86.79  | 576.9088   |
| 86.94  | 577.1436   |
| 87.57  | 615.6415   |
| 88.03  | 630.6115   |
| 88.47  | 575.4282   |
| 89.96  | 511.3407   |
| 91.11  | 408.4530   |
| 92.59  | 638.1353   |
| 92.59  | 638.1353   |
| 93.35  | 505.5246   |
| 94.67  | 354.8424   |
| 94.87  | 355.0206   |
| 94.87  | 355.0206   |
| 95.86  | 405.6320   |
| 97.43  | 410.3315   |
| 98.44  | 371.6198   |
| 99.53  | 325.1415   |
| 100.11 | 328.7379   |
| 103.18 | 371.7558   |
| 103.37 | 349.7655   |
| 105.31 | 329.0977   |
| 106.12 | 352.5457   |
| 109.28 | 344.9363   |
| 111.00 | 387.6094   |
| 111.76 | 368.9054   |
| 116.30 | 338.9133   |
| 117.23 | 349.3876   |
| 121.12 | 323.7426   |
| 121.78 | 325.2871   |
| 122.06 | 334.2735   |
| 123.07 | 373.5400   |
| 131.20 | 371.3121   |
| 133.52 | 349.3694   |
| 136.00 | 369.6979   |



|        |          |
|--------|----------|
| 136.47 | 362.1094 |
| 140.51 | 376.2854 |
| 140.51 | 0.0000   |
| 143.76 | 384.2938 |
| 144.24 | 362.8163 |
| 144.24 | 362.8163 |
| 145.44 | 365.9148 |
| 152.43 | 357.6951 |
| 153.25 | 357.0436 |
| 154.21 | 358.5178 |
| 154.21 | 358.5178 |
| 156.02 | 375.4721 |
| 158.56 | 340.0179 |
| 159.00 | 344.6896 |
| 162.66 | 371.7200 |
| 163.33 | 352.5515 |
| 165.86 | 337.9367 |
| 176.60 | 351.9972 |
| 177.52 | 352.5051 |
| 181.07 | 348.7693 |
| 184.41 | 340.2400 |
| 185.72 | 333.9038 |
| 193.51 | 340.5807 |
| 197.04 | 311.3766 |
| 205.31 | 326.4289 |
| 210.85 | 301.3941 |
| 215.65 | 306.0488 |
| 222.11 | 292.1771 |
| 227.38 | 347.9360 |
| 228.16 | 311.1073 |
| 228.18 | 311.1146 |
| 235.69 | 309.7384 |
| 235.96 | 319.3287 |
| 235.96 | 319.3287 |
| 238.63 | 287.4777 |
| 238.63 | 287.4777 |
| 240.99 | 288.3141 |
| 242.00 | 288.6703 |
| 244.70 | 266.8514 |
| 252.40 | 261.0570 |
| 252.80 | 270.2573 |
| 256.23 | 272.3596 |
| 256.23 | 272.3596 |
| 260.90 | 253.4795 |
| 264.66 | 220.8351 |
| 268.22 | 231.5829 |
| 269.46 | 238.4818 |
| 269.46 | 238.4818 |
| 271.23 | 291.1420 |
| 273.65 | 326.3524 |
| 276.40 | 261.8765 |
| 277.37 | 239.5476 |
| 277.60 | 239.6075 |
| 278.00 | 222.4871 |
| 279.20 | 244.3911 |
| 279.54 | 244.4808 |
| 280.46 | 238.0692 |
| 283.69 | 219.5685 |
| 284.31 | 217.3279 |
| 285.41 | 241.6448 |
| 285.90 | 239.6785 |
| 287.50 | 212.4790 |
| 293.27 | 0.0000   |
| 295.22 | 207.1674 |
| 295.96 | 207.3289 |
| 298.57 | 207.8911 |
| 299.98 | 208.1932 |
| 299.98 | 208.1932 |
| 300.09 | 208.2171 |
| 300.09 | 208.2171 |
| 300.13 | 208.2231 |
| 301.36 | 211.0392 |
| 302.85 | 226.7040 |
| 304.50 | 232.2061 |
| 304.50 | 232.2061 |
| 304.85 | 232.2891 |
| 308.46 | 213.2108 |
| 311.90 | 237.5979 |

|        |          |
|--------|----------|
| 316.51 | 204.1261 |
| 319.41 | 220.9554 |
| 320.08 | 192.9193 |
| 323.87 | 193.1985 |
| 323.87 | 193.1985 |
| 328.76 | 258.8121 |
| 333.37 | 175.6396 |
| 334.37 | 202.1765 |
| 334.37 | 202.1765 |
| 338.28 | 219.4599 |
| 338.28 | 219.4599 |
| 338.32 | 219.4690 |
| 338.32 | 219.4690 |
| 338.32 | 219.4690 |
| 340.48 | 182.1184 |
| 340.55 | 182.1284 |
| 344.28 | 207.0064 |
| 351.06 | 199.9621 |
| 351.93 | 194.3110 |
| 356.01 | 206.2335 |
| 364.49 | 207.7917 |
| 366.42 | 163.7993 |
| 383.85 | 171.7789 |
| 388.16 | 166.8682 |
| 388.63 | 175.2351 |
| 391.69 | 174.7558 |
| 400.66 | 173.2511 |
| 401.81 | 168.7518 |
| 402.40 | 174.1182 |
| 404.85 | 162.0007 |
| 410.95 | 172.1861 |
| 414.70 | 180.5485 |
| 423.72 | 180.2472 |
| 427.09 | 173.1088 |
| 427.87 | 159.8871 |
| 433.94 | 175.9298 |
| 453.88 | 140.7201 |
| 463.37 | 140.7164 |
| 468.07 | 134.0007 |
| 473.00 | 156.4458 |
| 476.78 | 146.9975 |
| 477.60 | 140.1730 |
| 487.02 | 132.1525 |
| 492.35 | 145.6026 |
| 497.08 | 147.0736 |
| 511.00 | 153.5039 |
| 514.00 | 158.5303 |
| 527.90 | 117.4286 |
| 529.87 | 0.0000   |
| 531.02 | 153.4753 |
| 537.26 | 165.3905 |
| 546.56 | 0.0000   |
| 563.25 | 133.6375 |
| 569.33 | 150.9012 |
| 569.50 | 143.5791 |
| 569.70 | 143.5991 |
| 583.19 | 119.4032 |
| 600.60 | 172.1352 |
| 602.73 | 138.9470 |
| 604.72 | 156.9398 |
| 609.32 | 179.1703 |
| 609.32 | 179.1703 |
| 610.33 | 179.2763 |
| 614.28 | 152.4231 |
| 618.01 | 148.2523 |
| 621.93 | 138.3156 |
| 621.93 | 138.3156 |
| 633.25 | 125.0541 |
| 635.95 | 118.7051 |
| 636.99 | 130.7607 |
| 645.85 | 145.6311 |
| 657.76 | 132.2461 |
| 661.66 | 140.8041 |
| 661.66 | 140.8041 |
| 664.57 | 0.0000   |
| 666.33 | 113.4757 |
| 666.50 | 113.4857 |
| 677.62 | 135.4967 |

|         |          |
|---------|----------|
| 685.70  | 130.4753 |
| 695.00  | 151.7036 |
| 696.49  | 155.5676 |
| 696.51  | 155.5710 |
| 697.00  | 150.9211 |
| 702.65  | 154.1771 |
| 706.68  | 129.9983 |
| 711.68  | 122.7690 |
| 720.70  | 118.7141 |
| 721.93  | 0.0000   |
| 722.78  | 109.0713 |
| 722.91  | 109.0783 |
| 723.31  | 99.3292  |
| 724.19  | 117.2913 |
| 727.33  | 99.5250  |
| 733.00  | 116.1649 |
| 735.93  | 112.7808 |
| 739.50  | 106.2734 |
| 747.24  | 114.3588 |
| 752.31  | 131.9773 |
| 753.82  | 120.5037 |
| 756.73  | 112.9486 |
| 763.94  | 102.9556 |
| 765.81  | 109.6946 |
| 766.42  | 121.3645 |
| 777.92  | 146.2555 |
| 778.90  | 128.7639 |
| 783.70  | 103.6299 |
| 785.37  | 120.6092 |
| 795.86  | 96.0642  |
| 801.95  | 107.9472 |
| 810.29  | 122.7008 |
| 810.76  | 115.8003 |
| 815.77  | 108.1240 |
| 818.51  | 98.3232  |
| 832.01  | 118.8935 |
| 834.85  | 136.0470 |
| 836.80  | 0.0000   |
| 846.77  | 132.7305 |
| 856.80  | 107.3345 |
| 860.56  | 109.2415 |
| 871.09  | 105.2957 |
| 873.19  | 110.8428 |
| 875.33  | 0.0000   |
| 879.36  | 92.7773  |
| 880.51  | 96.9019  |
| 883.24  | 91.9061  |
| 884.68  | 90.9393  |
| 889.28  | 93.1606  |
| 898.04  | 119.1837 |
| 911.20  | 79.6870  |
| 911.20  | 79.6870  |
| 911.20  | 79.6870  |
| 926.50  | 113.2889 |
| 937.49  | 116.9150 |
| 944.13  | 91.0551  |
| 946.00  | 99.5014  |
| 949.00  | 90.1817  |
| 962.29  | 101.1875 |
| 964.08  | 104.8742 |
| 966.15  | 121.2459 |
| 968.97  | 175.4226 |
| 968.97  | 175.4226 |
| 968.97  | 175.4226 |
| 983.53  | 82.8861  |
| 996.26  | 105.7072 |
| 1001.03 | 102.6875 |
| 1004.73 | 112.4683 |
| 1037.84 | 91.0718  |
| 1038.76 | 0.0000   |
| 1048.07 | 98.8722  |
| 1050.41 | 97.0865  |
| 1050.41 | 97.0865  |
| 1063.66 | 90.0435  |
| 1085.87 | 93.5825  |
| 1099.45 | 108.2666 |
| 1112.07 | 88.4670  |
| 1115.54 | 110.2954 |

|         |          |
|---------|----------|
| 1120.29 | 110.9509 |
| 1120.29 | 110.9509 |
| 1120.55 | 110.9630 |
| 1121.30 | 117.2107 |
| 1131.51 | 0.0000   |
| 1173.23 | 120.7002 |
| 1177.93 | 112.1122 |
| 1189.05 | 111.5349 |
| 1204.77 | 132.7447 |
| 1221.41 | 149.2568 |
| 1231.02 | 183.4127 |
| 1235.36 | 128.0687 |
| 1238.28 | 132.1604 |
| 1260.41 | 0.0000   |
| 1271.85 | 104.4099 |
| 1274.44 | 109.5132 |
| 1274.54 | 115.5455 |
| 1291.59 | 85.8419  |
| 1298.22 | 0.0000   |
| 1312.11 | 78.2354  |
| 1332.49 | 48.0393  |
| 1365.19 | 41.2695  |
| 1368.63 | 0.0000   |
| 1384.29 | 50.8286  |
| 1408.01 | 58.4746  |
| 1457.56 | 0.0000   |
| 1460.82 | 40.2517  |
| 1489.16 | 43.7570  |
| 1505.03 | 42.1985  |
| 1596.21 | 42.2249  |
| 1620.50 | 42.4773  |
| 1678.03 | 0.0000   |
| 1690.97 | 25.5263  |
| 1764.49 | 16.9751  |
| 1764.49 | 16.9751  |
| 1770.23 | 17.7745  |
| 1771.35 | 23.1132  |
| 1791.20 | 0.0000   |
| 1836.06 | 23.3334  |

TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G247970001

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 4.5150E+00 | ug/g |
| Total Uranium Counting Unc. | 4.3986E+00 | ug/g |
| Total Uranium Tpu           | 2.2442E-06 | ug/g |
| Total Uranium Mda           | 3.9778E+00 | ug/g |

```

*****
*
*               GEL Laboratories LLC               *
*               2040 SAVAGE ROAD                   *
*               CHARLESTON ,SC 29417               *
*               GROSS GAMMA REPORT                 *
*
*****
*
*  BATCH ID      : 958216                      SAMPLE ID   : G247970001
*  ANALYST       : MXR1                        DETECTOR    : GAM18
*  SAMPLE DATE   : 23-FEB-2010 12:00:00.00    COUNT TIME   : 0 02:00:00.00
*  ANALYSIS DATE : 11-MAR-2010 14:18:08.36    SAMPLE ALQT  : 126.980 GRAM
*
*****

```

```

GROSS GAMMA ACTIVITY (pCi/GRAM ) : 1.088E+01
GROSS GAMMA ERROR   (pCi/GRAM ) : 1.287E+00
GROSS GAMMA MDA     (pCi/GRAM ) : 2.478E+00
GROSS GAMMA DLC     (pCi/GRAM ) : 1.206E+00

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VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 21:29:08.22

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29414                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054948.CNF;1
Sample date        : 2-MAR-2010 00:00:00. Acquisition date : 11-MAR-2010 19:26:53
Sample ID          : G1202054948      Sample quantity   : 1.42620E+02 GRAM
Detector name      : GAM20            Detector geometry: CAN
Elapsed live time  : 0 02:00:00.00    Elapsed real time: 0 02:00:31.26  0.4%
Energy tolerance   : 1.50000 keV      Analyst Initials  : MXR1
Abundance limit    : 75.00000          Sensitivity       : 5.00000
Batch ID           : 958216            Detector SN#       :
Matrix Spike ID    :                   LCS ID            : 1032-A
*****

```

| Pk | It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit |
|----|----|---------|------|-------|------|---------|------|----|----------|------|-----|
| 1  | 0  | 92.99*  | 47   | 104   | 1.10 | 185.88  | 180  | 11 | 6.52E-03 | 52.6 |     |
| 2  | 0  | 846.13  | 28   | 3     | 1.88 | 1690.95 | 1686 | 10 | 3.95E-03 | 21.4 |     |
| 3  | 0  | 1040.55 | 10   | 4     | 1.33 | 2079.80 | 2075 | 8  | 1.39E-03 | 46.9 |     |

Flag: "\*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 11-MAR-2010 21:29:11

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054948.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8
Sample title      : MXR1
Sample date       : 2-MAR-2010 00:00:00   Acquisition date : 11-MAR-2010 19:26:53
Sample ID        : G1202054948           Sample quantity  : 142.62 GRAM
Sample type      : SOLID                  Sample geometry   :
Detector name    : GAMMA20               Detector geometry: CAN
Elapsed live time: 0 02:00:00.00         Elapsed real time: 0 02:00:31.26   0.4%
Peak Width (FWHM): 3.00                  Confidence level  : 5.00 %
Energy tolerance : 1.50 keV              Half life ratio   : 8.00
Errors propagated: Yes                   Systematic Error  : 0.00 %
Efficiency type  : Empirical              Efficiencies at   : Peak Energy
Abundance limit  : 75.00                  WTM error limit   : 3.00
  
```

Full Combined Activity-MDA Report

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| BE-7    | 477.60    | *            |     | 9.026E-02           | 1.355E-01 | 2.393E-01      | 2.326E-02 | 0.377   |
| NA-22   | 1274.54   | *            |     | -1.194E-02          | 1.910E-02 | 2.627E-02      | 2.176E-03 | -0.455  |
| NA-24   | 1368.63   | *            |     | 6.833E-05           | 1.910E-02 | Half-Life      | too short |         |
| K-40    | 1460.82   | *            |     | 5.443E-02           | 2.168E-01 | 4.042E-01      | 3.525E-02 | 0.135   |
| SC-46   | 889.28    | *            |     | 1.538E-02           | 1.797E-02 | 3.350E-02      | 3.340E-03 | 0.459   |
|         | 1120.55   |              |     | 1.059E-02           | 1.835E-02 | 3.321E-02      | 2.840E-03 | 0.319   |
| V-48    | 944.13    |              |     | 1.374E-01           | 2.940E-01 | 5.251E-01      | 5.124E-02 | 0.262   |
|         | 983.53    | *            |     | -2.318E-03          | 2.031E-02 | 3.245E-02      | 3.102E-03 | -0.071  |
|         | 1312.11   |              |     | 5.799E-03           | 2.855E-02 | 4.800E-02      | 4.005E-03 | 0.121   |
| CR-51   | 320.08    | *            |     | 8.114E-02           | 1.349E-01 | 2.381E-01      | 2.386E-02 | 0.341   |
| MN-54   | 834.85    | *            |     | -3.994E-03          | 1.542E-02 | 2.444E-02      | 2.469E-03 | -0.163  |
| CO-56   | + 846.77  | *            |     | 4.132E-02           | 1.820E-02 | 3.714E-02      | 3.743E-03 | 1.113   |
|         | 1037.84   |              |     | -8.747E-03          | 1.369E-01 | 1.899E-01      | 1.830E-02 | -0.046  |
|         | 1238.28   |              |     | 0.000E+00           | 2.832E-02 | 4.574E-02      | 3.870E-03 | 0.000   |
|         | 1771.35   |              |     | -8.360E-02          | 1.217E-01 | 1.575E-01      | 1.292E-02 | -0.531  |
| CO-57   | 122.06    | *            |     | -1.591E-03          | 9.884E-03 | 1.564E-02      | 1.305E-03 | -0.102  |
|         | 136.47    |              |     | 2.409E-02           | 8.434E-02 | 1.384E-01      | 1.252E-02 | 0.174   |
| CO-58   | 810.76    | *            |     | 1.084E-02           | 1.460E-02 | 2.735E-02      | 2.777E-03 | 0.396   |
| FE-59   | 1099.45   | *            |     | -2.555E-02          | 3.239E-02 | 4.246E-02      | 4.004E-03 | -0.602  |
|         | 1291.59   |              |     | -9.402E-03          | 4.149E-02 | 6.258E-02      | 5.951E-03 | -0.150  |
| CO-60   | 1173.23   |              |     | 8.364E-03           | 1.491E-02 | 2.734E-02      | 2.198E-03 | 0.306   |
|         | 1332.49   | *            |     | -1.214E-02          | 1.815E-02 | 2.404E-02      | 2.014E-03 | -0.505  |
| ZN-65   | 1115.54   | *            |     | -1.331E-02          | 3.625E-02 | 5.452E-02      | 4.693E-03 | -0.244  |
| SE-75   | 121.12    |              |     | 1.636E-02           | 4.798E-02 | 7.964E-02      | 8.661E-03 | 0.205   |
|         | 136.00    |              |     | 9.216E-03           | 1.607E-02 | 2.700E-02      | 2.282E-03 | 0.341   |
|         | 264.66    | *            |     | -1.394E-03          | 1.807E-02 | 2.998E-02      | 2.969E-03 | -0.047  |
|         | 279.54    |              |     | -1.377E-02          | 4.306E-02 | 6.936E-02      | 7.103E-03 | -0.199  |
|         | 400.66    |              |     | 1.068E-01           | 1.022E-01 | 1.884E-01      | 2.063E-02 | 0.567   |
| SR-85   | 514.00    | *            |     | -7.222E-02          | 3.210E-02 | 4.178E-02      | 3.901E-03 | -1.729  |
| Y-88    | 898.04    |              |     | 1.998E-02           | 2.121E-02 | 3.793E-02      | 3.785E-03 | 0.527   |
|         | 1836.06   | *            |     | 5.420E-03           | 1.673E-02 | 3.016E-02      | 2.433E-03 | 0.180   |
| Y-91    | 1204.77   | *            |     | 3.381E+00           | 7.282E+00 | 1.296E+01      | 1.052E+00 | 0.261   |
| NB-94   | 702.65    | *            |     | 9.331E-03           | 1.625E-02 | 2.915E-02      | 2.949E-03 | 0.320   |
|         | 871.09    |              |     | -1.349E-02          | 1.604E-02 | 2.242E-02      | 2.247E-03 | -0.602  |



---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| NB-95   |           | 765.81       | *   | -1.017E-02          | 1.796E-02 | 2.673E-02           | 2.716E-03 | -0.380  |
| NB-95M  |           | 235.69       | *   | -6.536E-02          | 5.430E-02 | 7.941E-02           | 8.546E-03 | -0.823  |
| ZR-95   |           | 724.19       |     | 1.769E-04           | 3.680E-02 | 6.164E-02           | 6.638E-03 | 0.003   |
|         |           | 756.73       | *   | 1.108E-02           | 2.871E-02 | 5.078E-02           | 5.555E-03 | 0.218   |
| MO-99   |           | 140.51       |     | -3.121E+00          | 2.659E+00 | 3.566E+00           | 8.441E-01 | -0.875  |
|         |           | 181.07       |     | 4.104E-01           | 1.869E+00 | 3.019E+00           | 5.716E-01 | 0.136   |
|         |           | 366.42       |     | 8.008E+00           | 1.346E+01 | 2.343E+01           | 2.083E+00 | 0.342   |
|         |           | 739.50       | *   | 1.059E+00           | 1.587E+00 | 2.872E+00           | 4.781E-01 | 0.369   |
|         |           | 777.92       |     | 1.264E+00           | 3.663E+00 | 6.469E+00           | 6.573E-01 | 0.195   |
| TC-99M  |           | 140.51       | *   | -8.772E+03          | 3.663E+00 | Half-Life too short |           |         |
| RU-103  |           | 497.08       | *   | 3.385E-03           | 1.613E-02 | 2.689E-02           | 3.858E-03 | 0.126   |
|         |           | 610.33       |     | 3.562E-02           | 3.905E-01 | 6.102E-01           | 1.039E-01 | 0.058   |
| RH-106  |           | 621.93       | *   | 1.587E-02           | 1.580E-01 | 2.560E-01           | 3.614E-02 | 0.062   |
|         |           | 1050.41      |     | -3.379E-01          | 1.143E+00 | 1.761E+00           | 1.608E-01 | -0.192  |
| RU-106  |           | 621.93       | *   | 1.587E-02           | 1.579E-01 | 2.560E-01           | 2.534E-02 | 0.062   |
|         |           | 1050.41      |     | -3.379E-01          | 1.143E+00 | 1.761E+00           | 1.608E-01 | -0.192  |
| AG-108M |           | 433.94       | *   | 4.115E-03           | 1.297E-02 | 2.204E-02           | 1.987E-03 | 0.187   |
|         |           | 614.28       |     | 1.187E-03           | 1.758E-02 | 2.836E-02           | 2.869E-03 | 0.042   |
|         |           | 722.91       |     | 3.734E-04           | 1.421E-02 | 2.389E-02           | 2.479E-03 | 0.016   |
| CD-109  |           | 88.03        | *   | 7.335E-02           | 2.933E-01 | 4.369E-01           | 4.132E-02 | 0.168   |
| AG-110M |           | 657.76       | *   | 3.625E-03           | 1.474E-02 | 2.566E-02           | 2.629E-03 | 0.141   |
|         |           | 677.62       |     | 7.068E-02           | 1.576E-01 | 2.790E-01           | 2.870E-02 | 0.253   |
|         |           | 706.68       |     | -6.131E-02          | 9.247E-02 | 1.391E-01           | 1.437E-02 | -0.441  |
|         |           | 763.94       |     | 1.361E-02           | 6.586E-02 | 1.134E-01           | 1.175E-02 | 0.120   |
|         |           | 884.68       |     | -2.390E-02          | 2.358E-02 | 3.169E-02           | 3.239E-03 | -0.754  |
|         |           | 937.49       |     | -4.340E-04          | 4.581E-02 | 7.530E-02           | 7.577E-03 | -0.006  |
|         |           | 1384.29      |     | -1.251E-03          | 7.318E-02 | 1.223E-01           | 1.059E-02 | -0.010  |
|         |           | 1505.03      |     | -2.363E-02          | 1.336E-01 | 2.135E-01           | 1.810E-02 | -0.111  |
| SN-113  |           | 391.69       | *   | 1.362E-04           | 1.738E-02 | 2.854E-02           | 2.462E-03 | 0.005   |
| CD-115  |           | 260.90       |     | -7.292E-01          | 1.133E+01 | 1.884E+01           | 1.854E+00 | -0.039  |
|         |           | 492.35       |     | 1.529E+00           | 3.027E+00 | 5.279E+00           | 4.852E-01 | 0.290   |
|         |           | 527.90       | *   | 1.622E-02           | 9.442E-01 | 1.527E+00           | 1.440E-01 | 0.011   |
| SN-117M |           | 156.02       |     | -1.232E-01          | 7.032E-01 | 1.099E+00           | 9.451E-02 | -0.112  |
|         |           | 158.56       | *   | 7.899E-03           | 1.736E-02 | 2.878E-02           | 2.484E-03 | 0.274   |
| TE-123M |           | 159.00       | *   | 5.186E-03           | 1.093E-02 | 1.819E-02           | 1.580E-03 | 0.285   |
| SB-124  |           | 602.73       |     | 6.391E-03           | 2.317E-02 | 3.817E-02           | 3.748E-03 | 0.167   |
|         |           | 645.85       |     | 4.928E-02           | 2.005E-01 | 3.495E-01           | 3.640E-02 | 0.141   |
|         |           | 722.78       |     | -5.906E-03          | 1.326E-01 | 2.202E-01           | 2.271E-02 | -0.027  |
|         |           | 1690.97      | *   | -7.395E-03          | 3.836E-02 | 5.986E-02           | 5.215E-03 | -0.124  |
| SB-125  |           | 427.87       | *   | 1.411E-03           | 3.981E-02 | 6.531E-02           | 5.777E-03 | 0.022   |
|         |           | 463.37       |     | -3.795E-02          | 1.262E-01 | 1.969E-01           | 1.891E-02 | -0.193  |
|         |           | 600.60       |     | 5.422E-02           | 1.099E-01 | 1.853E-01           | 1.923E-02 | 0.293   |
|         |           | 635.95       |     | -7.377E-02          | 1.184E-01 | 1.806E-01           | 1.907E-02 | -0.408  |
| TE-125M |           | 109.28       | *   | -8.600E-01          | 3.599E+00 | 5.681E+00           | 5.889E-01 | -0.151  |
| I-126   |           | 388.63       |     | 7.226E-03           | 5.122E-02 | 8.563E-02           | 7.212E-03 | 0.084   |
|         |           | 666.33       | *   | -2.924E-02          | 7.546E-02 | 1.200E-01           | 1.205E-02 | -0.244  |
|         |           | 753.82       |     | 3.937E-01           | 6.011E-01 | 1.098E+00           | 1.116E-01 | 0.359   |
| SB-126  |           | 414.70       |     | 2.499E-02           | 2.201E-02 | 4.135E-02           | 3.543E-03 | 0.604   |
|         |           | 666.50       |     | -8.620E-03          | 2.574E-02 | 4.128E-02           | 4.147E-03 | -0.209  |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         | 695.00    |              |     | 8.750E-03           | 2.742E-02 | 4.787E-02      | 4.837E-03 | 0.183   |
|         | 697.00    |              |     | -4.946E-02          | 1.001E-01 | 1.570E-01      | 1.587E-02 | -0.315  |
|         | 720.70    | *            |     | -2.181E-02          | 3.988E-02 | 5.993E-02      | 6.077E-03 | -0.364  |
|         | 856.80    |              |     | 5.595E-03           | 1.333E-01 | 2.226E-01      | 2.238E-02 | 0.025   |
| SN-126  | 64.28     |              |     | 1.740E-02           | 1.686E-01 | 2.985E-01      | 4.322E-02 | 0.058   |
|         | 86.94     |              |     | 2.021E-02           | 1.158E-01 | 1.818E-01      | 7.545E-02 | 0.111   |
|         | 87.57     | *            |     | -2.541E-04          | 2.988E-02 | 4.331E-02      | 4.073E-03 | -0.006  |
| SB-127  | 252.40    |              |     | -6.890E-03          | 6.813E-01 | 1.141E+00      | 4.726E-01 | -0.006  |
|         | 473.00    |              |     | 1.744E-02           | 2.963E-01 | 4.848E-01      | 5.769E-02 | 0.036   |
|         | 685.70    | *            |     | 7.784E-02           | 2.089E-01 | 3.703E-01      | 4.185E-02 | 0.210   |
|         | 783.70    |              |     | -4.556E-01          | 5.460E-01 | 7.652E-01      | 9.449E-02 | -0.595  |
| I-131   | 80.19     |              |     | -7.942E-01          | 8.586E-01 | 1.277E+00      | 1.098E-01 | -0.622  |
|         | 284.31    |              |     | 1.317E-01           | 4.052E-01 | 6.969E-01      | 7.169E-02 | 0.189   |
|         | 364.49    | *            |     | -6.855E-03          | 3.862E-02 | 6.243E-02      | 5.836E-03 | -0.110  |
|         | 636.99    |              |     | 1.802E-01           | 4.217E-01 | 7.536E-01      | 7.806E-02 | 0.239   |
| TE-132  | 49.72     |              |     | -8.000E-01          | 1.324E+00 | 2.060E+00      | 1.858E-01 | -0.388  |
|         | 111.76    |              |     | -4.250E-02          | 4.698E+00 | 7.120E+00      | 6.797E-01 | -0.006  |
|         | 116.30    |              |     | 5.461E-01           | 3.337E+00 | 5.457E+00      | 5.180E-01 | 0.100   |
|         | 228.16    | *            |     | -7.541E-02          | 9.644E-02 | 1.495E-01      | 2.315E-02 | -0.505  |
| BA-133  | 81.00     |              |     | -1.662E-02          | 2.735E-02 | 4.187E-02      | 6.507E-03 | -0.397  |
|         | 276.40    |              |     | -3.191E-02          | 1.499E-01 | 2.447E-01      | 3.660E-02 | -0.130  |
|         | 302.85    |              |     | 3.589E-02           | 5.494E-02 | 9.747E-02      | 1.352E-02 | 0.368   |
|         | 356.01    | *            |     | -1.507E-02          | 1.851E-02 | 2.730E-02      | 3.621E-03 | -0.552  |
|         | 383.85    |              |     | -2.791E-02          | 1.258E-01 | 2.006E-01      | 2.480E-02 | -0.139  |
| I-133   | 529.87    | *            |     | 4.748E-06           | 1.258E-01 | Half-Life      | too short |         |
|         | 875.33    |              |     | 7.855E-04           | 1.258E-01 | Half-Life      | too short |         |
|         | 1298.22   |              |     | 1.188E-03           | 1.258E-01 | Half-Life      | too short |         |
| CS-134  | 563.25    |              |     | 8.042E-02           | 1.520E-01 | 2.644E-01      | 2.565E-02 | 0.304   |
|         | 569.33    |              |     | -4.243E-02          | 8.550E-02 | 1.257E-01      | 1.227E-02 | -0.338  |
|         | 604.72    |              |     | 1.715E-03           | 1.981E-02 | 3.201E-02      | 3.152E-03 | 0.054   |
|         | 795.86    | *            |     | 5.144E-03           | 1.897E-02 | 3.294E-02      | 3.361E-03 | 0.156   |
|         | 801.95    |              |     | -8.942E-02          | 1.704E-01 | 2.430E-01      | 2.475E-02 | -0.368  |
|         | 1365.19   |              |     | -1.351E-01          | 5.825E-01 | 9.286E-01      | 8.190E-02 | -0.145  |
| CS-135  | 268.22    | *            |     | 3.025E-04           | 6.144E-02 | 1.027E-01      | 1.138E-02 | 0.003   |
| I-135   | 546.56    |              |     | 4.662E+03           | 6.144E-02 | Half-Life      | too short |         |
|         | 836.80    |              |     | 8.160E+03           | 6.144E-02 | Half-Life      | too short |         |
|         | 1038.76   |              |     | 8.276E+03           | 6.144E-02 | Half-Life      | too short |         |
|         | 1131.51   |              |     | -2.418E+03          | 6.144E-02 | Half-Life      | too short |         |
|         | 1260.41   | *            |     | -1.702E+02          | 6.144E-02 | Half-Life      | too short |         |
|         | 1457.56   |              |     | -1.411E+04          | 6.144E-02 | Half-Life      | too short |         |
|         | 1678.03   |              |     | 7.175E+03           | 6.144E-02 | Half-Life      | too short |         |
|         | 1791.20   |              |     | -1.997E+03          | 6.144E-02 | Half-Life      | too short |         |
| CS-136  | 153.25    |              |     | 8.714E-02           | 2.450E-01 | 4.040E-01      | 4.127E-02 | 0.216   |
|         | 176.60    |              |     | 9.069E-02           | 1.529E-01 | 2.562E-01      | 2.495E-02 | 0.354   |
|         | 273.65    |              |     | 7.011E-02           | 1.622E-01 | 2.816E-01      | 2.974E-02 | 0.249   |
|         | 340.55    |              |     | 4.219E-02           | 4.470E-02 | 8.107E-02      | 7.811E-03 | 0.520   |
|         | 818.51    |              |     | 7.859E-03           | 2.455E-02 | 4.292E-02      | 4.347E-03 | 0.183   |
|         | 1048.07   | *            |     | -2.333E-02          | 3.700E-02 | 5.280E-02      | 5.007E-03 | -0.442  |
|         | 1235.36   |              |     | 3.372E-02           | 1.378E-01 | 2.353E-01      | 2.694E-02 | 0.143   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| BA-137M | 661.66    | *            |     | -4.280E-03          | 1.552E-02 | 2.507E-02      | 2.516E-03 | -0.171  |
| CS-137  | 661.66    | *            |     | -4.522E-03          | 1.640E-02 | 2.649E-02      | 2.662E-03 | -0.171  |
| CE-139  | 165.86    | *            |     | -9.546E-03          | 1.231E-02 | 1.795E-02      | 1.567E-03 | -0.532  |
| BA-140  | 162.66    |              |     | 2.551E-01           | 2.455E-01 | 4.273E-01      | 3.957E-02 | 0.597   |
|         | 304.85    |              |     | -1.162E-01          | 4.051E-01 | 6.484E-01      | 1.921E-01 | -0.179  |
|         | 423.72    |              |     | 1.230E-04           | 6.417E-01 | 1.048E+00      | 3.449E-01 | 0.000   |
|         | 537.26    | *            |     | 7.873E-03           | 8.061E-02 | 1.320E-01      | 4.506E-02 | 0.060   |
| LA-140  | 328.76    |              |     | 9.839E-02           | 9.314E-02 | 1.705E-01      | 1.697E-02 | 0.577   |
|         | 487.02    |              |     | 3.629E-02           | 4.442E-02 | 8.022E-02      | 7.747E-03 | 0.452   |
|         | 815.77    |              |     | -6.990E-02          | 1.102E-01 | 1.625E-01      | 1.788E-02 | -0.430  |
|         | 1596.21   | *            |     | 1.022E-02           | 3.188E-02 | 5.686E-02      | 4.801E-03 | 0.180   |
| CE-141  | 145.44    | *            |     | 1.851E-02           | 2.265E-02 | 3.877E-02      | 3.348E-03 | 0.477   |
| CE-143  | 57.36     |              |     | -8.637E+00          | 1.924E+01 | 3.035E+01      | 2.836E+00 | -0.285  |
|         | 293.27    | *            |     | 1.565E+00           | 3.901E+00 | 6.710E+00      | 1.474E+00 | 0.233   |
|         | 664.57    |              |     | 3.516E+00           | 3.570E+01 | 6.084E+01      | 1.853E+01 | 0.058   |
|         | 721.93    |              |     | 1.201E+01           | 3.119E+01 | 5.547E+01      | 1.582E+01 | 0.217   |
| CE-144  | 80.12     |              |     | -6.786E-01          | 7.237E-01 | 1.075E+00      | 9.208E-02 | -0.631  |
|         | 133.52    | *            |     | -3.315E-03          | 7.811E-02 | 1.246E-01      | 1.887E-02 | -0.027  |
| PM-144  | 476.78    |              |     | 3.839E-02           | 2.941E-02 | 5.537E-02      | 5.419E-03 | 0.693   |
|         | 618.01    |              |     | -6.557E-03          | 1.618E-02 | 2.423E-02      | 2.446E-03 | -0.271  |
|         | 696.49    | *            |     | 2.082E-03           | 1.655E-02 | 2.820E-02      | 2.851E-03 | 0.074   |
| PR-144  | 696.51    | *            |     | 1.484E-01           | 1.234E+00 | 2.102E+00      | 2.124E-01 | 0.071   |
|         | 1489.16   |              |     | -2.089E+00          | 5.795E+00 | 8.734E+00      | 7.404E-01 | -0.239  |
| PM-146  | 453.88    | *            |     | -6.699E-03          | 1.860E-02 | 2.870E-02      | 3.106E-03 | -0.233  |
|         | 633.25    |              |     | 4.119E-01           | 6.323E-01 | 1.087E+00      | 4.188E-01 | 0.379   |
|         | 735.93    |              |     | 2.385E-02           | 6.441E-02 | 1.130E-01      | 3.226E-02 | 0.211   |
|         | 747.24    |              |     | 3.495E-03           | 4.309E-02 | 7.287E-02      | 1.133E-02 | 0.048   |
| ND-147  | 91.11     |              |     | 1.106E-01           | 7.668E-02 | 1.253E-01      | 1.240E-02 | 0.882   |
|         | 319.41    |              |     | 1.973E-01           | 1.000E+00 | 1.694E+00      | 1.630E-01 | 0.116   |
|         | 531.02    | *            |     | 4.182E-02           | 1.747E-01 | 2.920E-01      | 4.509E-02 | 0.143   |
| PM-149  | 285.90    | *            |     | -2.402E+00          | 7.651E+00 | 1.233E+01      | 2.007E+00 | -0.195  |
| EU-152  | 121.78    |              |     | 7.767E-03           | 2.764E-02 | 4.561E-02      | 4.407E-03 | 0.170   |
|         | 244.70    |              |     | 5.325E-02           | 1.365E-01 | 2.369E-01      | 2.298E-02 | 0.225   |
|         | 344.28    | *            |     | -3.489E-02          | 4.052E-02 | 5.940E-02      | 5.794E-03 | -0.587  |
|         | 778.90    |              |     | -1.306E-02          | 1.047E-01 | 1.707E-01      | 1.734E-02 | -0.077  |
|         | 964.08    |              |     | 1.152E-01           | 1.178E-01 | 2.232E-01      | 2.157E-02 | 0.516   |
|         | 1085.87   |              |     | 1.554E-01           | 1.788E-01 | 3.346E-01      | 2.962E-02 | 0.465   |
|         | 1112.07   |              |     | -2.945E-02          | 1.334E-01 | 2.077E-01      | 1.792E-02 | -0.142  |
|         | 1408.01   |              |     | -5.779E-02          | 7.200E-02 | 9.295E-02      | 7.853E-03 | -0.622  |
| GD-153  | 69.67     |              |     | -1.968E-01          | 4.721E-01 | 7.438E-01      | 5.690E-02 | -0.265  |
|         | 97.43     | *            |     | 5.204E-03           | 3.243E-02 | 4.778E-02      | 4.237E-03 | 0.109   |
|         | 103.18    |              |     | -2.222E-02          | 3.661E-02 | 5.533E-02      | 4.786E-03 | -0.402  |
| EU-154  | 123.07    |              |     | 1.218E-02           | 2.022E-02 | 3.423E-02      | 3.813E-03 | 0.356   |
|         | 723.31    |              |     | 6.152E-03           | 6.696E-02 | 1.137E-01      | 1.239E-02 | 0.054   |
|         | 873.19    |              |     | 6.471E-02           | 1.285E-01 | 2.297E-01      | 2.972E-02 | 0.282   |
|         | 996.26    |              |     | -1.234E-01          | 1.714E-01 | 2.412E-01      | 4.320E-02 | -0.512  |
|         | 1004.73   |              |     | 5.407E-02           | 1.018E-01 | 1.811E-01      | 2.219E-02 | 0.299   |
|         | 1274.44   | *            |     | -2.977E-02          | 5.267E-02 | 7.330E-02      | 8.150E-03 | -0.406  |
| EU-155  | 86.55     |              |     | 9.623E-03           | 3.170E-02 | 5.280E-02      | 4.944E-03 | 0.182   |

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TB-160  | 105.31    | *            |     | -4.099E-02          | 3.941E-02 | 5.348E-02      | 4.647E-03 | -0.767  |
|         | 86.79     |              |     | 4.360E-02           | 8.193E-02 | 1.331E-01      | 1.239E-02 | 0.328   |
|         | 197.04    |              |     | 1.279E-01           | 2.338E-01 | 3.945E-01      | 3.610E-02 | 0.324   |
|         | 215.65    |              |     | 1.367E-01           | 2.897E-01 | 5.078E-01      | 4.769E-02 | 0.269   |
|         | 298.57    |              |     | -1.641E-02          | 4.339E-02 | 6.919E-02      | 6.800E-03 | -0.237  |
|         | 879.36    | *            |     | -2.337E-02          | 7.251E-02 | 1.048E-01      | 1.048E-02 | -0.223  |
|         | 962.29    |              |     | 1.380E-02           | 2.010E-01 | 3.344E-01      | 3.234E-02 | 0.041   |
|         | 966.15    |              |     | -4.392E-02          | 8.730E-02 | 1.316E-01      | 1.270E-02 | -0.334  |
| HO-166M | 1177.93   |              |     | -3.409E-02          | 1.246E-01 | 1.888E-01      | 1.521E-02 | -0.181  |
|         | 1271.85   |              |     | -3.750E-02          | 2.721E-01 | 4.241E-01      | 3.506E-02 | -0.088  |
|         | 80.57     |              |     | -6.469E-02          | 7.830E-02 | 1.175E-01      | 1.012E-02 | -0.550  |
|         | 184.41    |              |     | -2.200E-02          | 1.559E-02 | 2.578E-02      | 2.315E-03 | -0.854  |
|         | 280.46    |              |     | -1.610E-02          | 3.534E-02 | 5.607E-02      | 5.579E-03 | -0.287  |
|         | 410.95    |              |     | -1.597E-01          | 1.024E-01 | 1.265E-01      | 1.080E-02 | -1.262  |
|         | 711.68    | *            |     | -9.082E-03          | 2.635E-02 | 4.179E-02      | 4.233E-03 | -0.217  |
|         | 752.31    |              |     | 9.112E-03           | 1.243E-01 | 2.098E-01      | 2.132E-02 | 0.043   |
| TA-182  | 810.29    |              |     | 1.506E-02           | 2.355E-02 | 4.340E-02      | 4.399E-03 | 0.347   |
|         | 67.75     |              |     | 3.893E-03           | 3.009E-02 | 4.986E-02      | 3.748E-03 | 0.078   |
|         | 100.11    |              |     | 1.177E-03           | 5.881E-02 | 9.536E-02      | 8.350E-03 | 0.012   |
|         | 152.43    |              |     | 3.107E-02           | 1.305E-01 | 2.128E-01      | 1.820E-02 | 0.146   |
|         | 222.11    |              |     | -8.873E-02          | 1.288E-01 | 2.018E-01      | 1.910E-02 | -0.440  |
|         | 1121.30   |              |     | 2.376E-02           | 5.243E-02 | 9.280E-02      | 7.932E-03 | 0.256   |
|         | 1189.05   |              |     | 1.687E-02           | 9.534E-02 | 1.613E-01      | 1.304E-02 | 0.105   |
|         | 1221.41   | *            |     | -1.540E-02          | 6.387E-02 | 9.709E-02      | 7.922E-03 | -0.159  |
| IR-192  | 1231.02   |              |     | 6.930E-02           | 1.505E-01 | 2.687E-01      | 2.198E-02 | 0.258   |
|         | 295.96    |              |     | -5.051E-03          | 4.339E-02 | 7.135E-02      | 7.066E-03 | -0.071  |
|         | 308.46    |              |     | 2.888E-03           | 3.896E-02 | 6.521E-02      | 6.376E-03 | 0.044   |
|         | 316.51    | *            |     | -3.204E-03          | 1.417E-02 | 2.289E-02      | 2.214E-03 | -0.140  |
| HG-203  | 468.07    |              |     | 2.364E-04           | 3.081E-02 | 5.009E-02      | 4.816E-03 | 0.005   |
|         | 70.83     |              |     | 9.140E-02           | 3.185E-01 | 5.345E-01      | 8.340E-02 | 0.171   |
|         | 72.87     |              |     | -8.402E-02          | 1.944E-01 | 3.047E-01      | 4.615E-02 | -0.276  |
| BI-207  | 279.20    | *            |     | -4.771E-03          | 1.440E-02 | 2.316E-02      | 2.351E-03 | -0.206  |
|         | 72.81     |              |     | -2.431E-02          | 4.829E-02 | 7.526E-02      | 5.939E-03 | -0.323  |
|         | 74.97     |              |     | -9.531E-03          | 3.295E-02 | 5.215E-02      | 4.211E-03 | -0.183  |
|         | 569.70    |              |     | -1.292E-03          | 1.242E-02 | 1.957E-02      | 1.891E-03 | -0.066  |
| TL-208  | 1063.66   | *            |     | 1.027E-02           | 2.367E-02 | 4.166E-02      | 3.761E-03 | 0.246   |
|         | 1770.23   |              |     | -6.738E-02          | 2.411E-01 | 3.637E-01      | 2.984E-02 | -0.185  |
|         | 277.37    |              |     | 5.450E-02           | 1.543E-01 | 2.663E-01      | 3.589E-02 | 0.205   |
| PB-210  | 583.19    | *            |     | -2.182E-02          | 1.940E-02 | 2.474E-02      | 2.541E-03 | -0.882  |
|         | 860.56    |              |     | 4.708E-02           | 1.167E-01 | 2.066E-01      | 2.189E-02 | 0.228   |
| BI-211  | 46.54     | *            |     | -5.129E-01          | 8.700E-01 | 1.332E+00      | 1.224E-01 | -0.385  |
| BI-211  | 72.87     |              |     | -3.652E-01          | 8.436E-01 | 1.325E+00      | 1.046E-01 | -0.276  |
| PB-211  | 351.06    | *            |     | 2.821E-02           | 1.009E-01 | 1.594E-01      | 1.527E-02 | 0.177   |
|         | 404.85    | *            |     | -2.045E-01          | 3.154E-01 | 4.441E-01      | 2.148E-01 | -0.460  |
| BI-212  | 427.09    |              |     | 4.994E-02           | 7.067E-01 | 1.163E+00      | 5.384E-01 | 0.043   |
|         | 832.01    |              |     | -1.965E-01          | 4.242E-01 | 6.238E-01      | 3.252E-01 | -0.315  |
|         | 727.33    | *            |     | 1.246E-01           | 2.350E-01 | 4.185E-01      | 5.675E-02 | 0.298   |
|         | 785.37    |              |     | -3.601E-01          | 1.282E+00 | 2.031E+00      | 2.063E-01 | -0.177  |
|         | 1620.50   |              |     | -1.848E-02          | 1.119E+00 | 1.847E+00      | 1.555E-01 | -0.010  |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| PB-212  | 74.82     |              |     | -4.840E-02          | 1.136E-01 | 1.775E-01      | 2.243E-02 | -0.273  |
|         | 77.11     |              |     | 2.166E-02           | 6.484E-02 | 1.071E-01      | 8.860E-03 | 0.202   |
|         | 238.63    | *            |     | -1.044E-02          | 2.960E-02 | 4.856E-02      | 5.185E-03 | -0.215  |
|         | 300.09    |              |     | -2.037E-01          | 3.498E-01 | 5.273E-01      | 6.083E-02 | -0.386  |
| BI-214  | 609.32    | *            |     | -1.656E-02          | 4.158E-02 | 6.084E-02      | 6.797E-03 | -0.272  |
|         | 1120.29   |              |     | 3.417E-02           | 1.166E-01 | 2.005E-01      | 2.179E-02 | 0.170   |
|         | 1764.49   |              |     | -6.991E-02          | 1.464E-01 | 2.182E-01      | 1.792E-02 | -0.320  |
|         |           |              |     |                     |           |                |           |         |
| PB-214  | 74.82     |              |     | -8.578E-02          | 2.013E-01 | 3.146E-01      | 3.558E-02 | -0.273  |
|         | 77.11     |              |     | 3.819E-02           | 1.144E-01 | 1.888E-01      | 2.206E-02 | 0.202   |
|         | 242.00    |              |     | -1.840E-01          | 1.575E-01 | 2.355E-01      | 2.656E-02 | -0.781  |
|         | 295.22    |              |     | -9.424E-03          | 6.192E-02 | 1.015E-01      | 1.199E-02 | -0.093  |
| RN-219  | 351.93    | *            |     | 1.691E-02           | 3.630E-02 | 5.837E-02      | 6.446E-03 | 0.290   |
|         | 271.23    |              |     | 6.040E-02           | 9.564E-02 | 1.691E-01      | 1.921E-02 | 0.357   |
|         | 401.81    | *            |     | 6.419E-02           | 1.675E-01 | 2.878E-01      | 4.253E-02 | 0.223   |
|         |           |              |     |                     |           |                |           |         |
| RA-223  | 81.07     |              |     | -3.508E-02          | 6.204E-02 | 9.575E-02      | 8.297E-03 | -0.366  |
|         | 83.79     |              |     | -7.621E-03          | 4.008E-02 | 6.471E-02      | 5.800E-03 | -0.118  |
|         | 94.87     |              |     | 2.541E-01           | 1.784E-01 | 2.950E-01      | 2.653E-02 | 0.862   |
|         | 144.24    |              |     | 2.578E-01           | 3.012E-01 | 4.983E-01      | 4.726E-02 | 0.517   |
| RA-224  | 154.21    |              |     | -1.804E-02          | 1.558E-01 | 2.452E-01      | 2.306E-02 | -0.074  |
|         | 269.46    |              |     | -2.018E-02          | 7.344E-02 | 1.192E-01      | 1.198E-02 | -0.169  |
|         | 323.87    | *            |     | -2.266E-01          | 2.811E-01 | 4.179E-01      | 7.448E-02 | -0.542  |
|         | 338.28    |              |     | 9.809E-02           | 4.152E-01 | 7.031E-01      | 8.871E-02 | 0.140   |
| RA-226  | 240.99    | *            |     | -3.579E-01          | 2.839E-01 | 4.222E-01      | 4.081E-02 | -0.848  |
|         | 609.32    | *            |     | -1.656E-02          | 4.158E-02 | 6.084E-02      | 6.797E-03 | -0.272  |
|         | 1120.29   |              |     | 3.417E-02           | 1.166E-01 | 2.005E-01      | 2.179E-02 | 0.170   |
|         | 1764.49   |              |     | -6.991E-02          | 1.464E-01 | 2.182E-01      | 1.792E-02 | -0.320  |
| AC-227  | 79.69     |              |     | -3.298E-01          | 3.672E-01 | 5.422E-01      | 9.319E-02 | -0.608  |
|         | 235.96    |              |     | -6.615E-02          | 6.799E-02 | 1.017E-01      | 1.138E-02 | -0.650  |
|         | 256.23    | *            |     | 9.977E-03           | 1.070E-01 | 1.807E-01      | 2.335E-02 | 0.055   |
|         | 299.98    |              |     | -1.857E-01          | 3.810E-01 | 5.801E-01      | 7.858E-02 | -0.320  |
| TH-227  | 304.50    |              |     | -1.531E-01          | 6.451E-01 | 1.041E+00      | 1.787E-01 | -0.147  |
|         | 334.37    |              |     | 2.023E-01           | 6.970E-01 | 1.190E+00      | 1.909E-01 | 0.170   |
|         | 79.80     |              |     | -5.971E-01          | 5.067E-01 | 7.102E-01      | 1.544E-01 | -0.841  |
|         | 235.96    |              |     | -6.615E-02          | 6.795E-02 | 1.017E-01      | 1.083E-02 | -0.650  |
| AC-228  | 256.23    | *            |     | 9.977E-03           | 1.070E-01 | 1.807E-01      | 2.599E-02 | 0.055   |
|         | 299.98    |              |     | -1.857E-01          | 3.810E-01 | 5.801E-01      | 7.858E-02 | -0.320  |
|         | 304.50    |              |     | -1.531E-01          | 6.451E-01 | 1.041E+00      | 1.787E-01 | -0.147  |
|         | 334.37    |              |     | 2.023E-01           | 6.970E-01 | 1.190E+00      | 1.909E-01 | 0.170   |
| RA-228  | 338.32    |              |     | 2.564E-02           | 1.052E-01 | 1.775E-01      | 7.434E-02 | 0.144   |
|         | 911.20    | *            |     | 2.259E-02           | 6.528E-02 | 1.171E-01      | 1.472E-02 | 0.193   |
|         | 968.97    |              |     | -5.645E-02          | 1.239E-01 | 1.959E-01      | 4.847E-02 | -0.288  |
|         |           |              |     |                     |           |                |           |         |
| TH-228  | 338.32    |              |     | 2.564E-02           | 1.052E-01 | 1.775E-01      | 7.434E-02 | 0.144   |
|         | 911.20    | *            |     | 2.259E-02           | 6.528E-02 | 1.171E-01      | 1.472E-02 | 0.193   |
|         | 968.97    |              |     | -5.645E-02          | 1.239E-01 | 1.959E-01      | 4.847E-02 | -0.288  |
|         |           |              |     |                     |           |                |           |         |
| TH-229  | 74.82     |              |     | -4.840E-02          | 1.135E-01 | 1.775E-01      | 1.446E-02 | -0.273  |
|         | 77.11     |              |     | 2.166E-02           | 6.484E-02 | 1.071E-01      | 8.860E-03 | 0.202   |
|         | 238.63    | *            |     | -1.044E-02          | 2.960E-02 | 4.856E-02      | 5.185E-03 | -0.215  |
|         | 300.09    |              |     | -2.037E-01          | 3.707E-01 | 5.273E-01      | 3.238E-01 | -0.386  |
| TH-229  | 85.43     |              |     | -3.891E-02          | 7.430E-02 | 1.129E-01      | 1.033E-02 | -0.345  |
|         |           |              |     |                     |           |                |           |         |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         |           | 88.47        |     | -1.754E-03          | 4.486E-02 | 6.478E-02      | 6.102E-03 | -0.027  |
|         |           | 193.51       | *   | 8.977E-03           | 1.920E-01 | 3.267E-01      | 2.975E-02 | 0.027   |
|         |           | 210.85       |     | -8.530E-02          | 3.487E-01 | 5.764E-01      | 5.379E-02 | -0.148  |
| PA-231  |           | 283.69       | *   | 2.674E-01           | 5.898E-01 | 1.027E+00      | 1.582E-01 | 0.260   |
|         |           | 301.36       |     | -9.259E-02          | 2.409E-01 | 3.707E-01      | 4.826E-02 | -0.250  |
| TH-231  |           | 81.07        |     | -3.508E-02          | 6.204E-02 | 9.575E-02      | 8.297E-03 | -0.366  |
|         |           | 83.79        |     | -7.621E-03          | 4.008E-02 | 6.471E-02      | 5.800E-03 | -0.118  |
|         |           | 94.87        |     | 2.541E-01           | 1.784E-01 | 2.950E-01      | 2.653E-02 | 0.862   |
|         |           | 144.24       |     | 2.578E-01           | 3.012E-01 | 4.983E-01      | 4.726E-02 | 0.517   |
|         |           | 154.21       |     | -1.804E-02          | 1.558E-01 | 2.452E-01      | 2.306E-02 | -0.074  |
|         |           | 269.46       |     | -2.018E-02          | 7.344E-02 | 1.192E-01      | 1.198E-02 | -0.169  |
|         |           | 323.87       | *   | -2.266E-01          | 2.811E-01 | 4.179E-01      | 7.448E-02 | -0.542  |
|         |           | 338.28       |     | 9.809E-02           | 4.152E-01 | 7.031E-01      | 8.871E-02 | 0.140   |
| TH-232  |           | 338.32       |     | 2.564E-02           | 1.047E-01 | 1.775E-01      | 1.663E-02 | 0.144   |
|         |           | 911.20       | *   | 2.259E-02           | 6.528E-02 | 1.171E-01      | 1.472E-02 | 0.193   |
|         |           | 968.97       |     | -5.645E-02          | 1.239E-01 | 1.959E-01      | 4.847E-02 | -0.288  |
| PA-233  |           | 300.13       |     | -1.014E-01          | 1.745E-01 | 2.625E-01      | 4.083E-02 | -0.386  |
|         |           | 311.90       | *   | -2.551E-03          | 2.847E-02 | 4.679E-02      | 4.643E-03 | -0.055  |
|         |           | 340.48       |     | 2.462E-01           | 2.591E-01 | 4.603E-01      | 1.120E-01 | 0.535   |
| PA-234  |           | 94.67        |     | 1.402E-01           | 6.984E-02 | 1.177E-01      | 1.492E-02 | 1.191   |
|         |           | 98.44        |     | -1.129E-03          | 3.153E-02 | 5.087E-02      | 2.839E-02 | -0.022  |
|         |           | 111.00       |     | 1.176E-02           | 7.449E-02 | 1.217E-01      | 1.458E-02 | 0.097   |
|         |           | 131.20       |     | 1.498E-02           | 3.974E-02 | 6.597E-02      | 5.514E-03 | 0.227   |
|         |           | 569.50       |     | -6.468E-02          | 1.176E-01 | 1.708E-01      | 1.650E-02 | -0.379  |
|         |           | 733.00       |     | -1.867E-01          | 1.632E-01 | 2.081E-01      | 4.753E-02 | -0.897  |
|         |           | 880.51       |     | 2.773E-03           | 1.419E-01 | 2.148E-01      | 2.147E-02 | 0.013   |
|         |           | 883.24       |     | -6.364E-02          | 1.390E-01 | 1.999E-01      | 1.347E-01 | -0.318  |
|         |           | 926.50       |     | 5.739E-03           | 7.309E-02 | 1.222E-01      | 3.143E-02 | 0.047   |
|         |           | 946.00       | *   | -5.034E-02          | 1.285E-01 | 1.945E-01      | 3.756E-02 | -0.259  |
|         |           | 949.00       |     | 1.118E-02           | 1.778E-01 | 2.962E-01      | 2.884E-02 | 0.038   |
| PA-234M |           | 766.42       |     | -1.647E+00          | 4.965E+00 | 7.568E+00      | 3.861E+00 | -0.218  |
|         |           | 1001.03      | *   | 1.976E+00           | 2.436E+00 | 4.481E+00      | 4.793E-01 | 0.441   |
| TH-234  |           | 63.29        | *   | 5.384E-02           | 4.448E-01 | 7.899E-01      | 1.403E-01 | 0.068   |
|         | +         | 92.59        |     | 4.074E-01           | 4.378E-01 | 5.696E-01      | 1.269E-01 | 0.715   |
| U-235   |           | 89.96        |     | 9.224E-03           | 3.064E-01 | 4.455E-01      | 1.108E-01 | 0.021   |
|         | +         | 93.35        |     | 3.077E-01           | 3.314E-01 | 4.319E-01      | 1.005E-01 | 0.712   |
|         |           | 143.76       | *   | 7.261E-02           | 8.932E-02 | 1.465E-01      | 2.471E-02 | 0.496   |
|         |           | 163.33       |     | 1.508E-01           | 1.781E-01 | 3.029E-01      | 5.449E-02 | 0.498   |
|         |           | 185.72       |     | -1.072E-02          | 2.013E-02 | 3.541E-02      | 3.186E-03 | -0.303  |
|         |           | 205.31       |     | 9.477E-02           | 2.059E-01 | 3.592E-01      | 6.631E-02 | 0.264   |
| NP-237  |           | 86.48        | *   | 2.461E-02           | 7.844E-02 | 1.305E-01      | 2.992E-02 | 0.189   |
|         |           | 95.86        |     | 7.951E-02           | 3.534E-01 | 5.239E-01      | 1.263E-01 | 0.152   |
| U-238   |           | 63.29        | *   | 5.384E-02           | 4.448E-01 | 7.899E-01      | 1.403E-01 | 0.068   |
|         | +         | 92.59        |     | 4.074E-01           | 4.299E-01 | 5.696E-01      | 5.199E-02 | 0.715   |
| NP-239  |           | 99.53        |     | 9.198E-03           | 5.709E-02 | 9.381E-02      | 8.236E-03 | 0.098   |
|         |           | 103.37       |     | -1.539E-02          | 3.361E-02 | 5.169E-02      | 4.468E-03 | -0.298  |
|         |           | 106.12       |     | -9.348E-03          | 3.132E-02 | 4.659E-02      | 3.991E-03 | -0.201  |
|         |           | 117.23       | *   | -4.321E-02          | 1.440E-01 | 2.245E-01      | 1.880E-02 | -0.192  |
|         |           | 228.18       |     | -6.665E-02          | 8.938E-02 | 1.397E-01      | 1.332E-02 | -0.477  |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         | 277.60    |              |     | 2.848E-02           | 7.092E-02 | 1.230E-01      | 1.224E-02 | 0.232   |
| AM-241  | 59.54     | *            |     | -8.496E-03          | 3.909E-02 | 6.298E-02      | 4.928E-03 | -0.135  |
| CM-247  | 278.00    |              |     | 2.025E-02           | 3.034E-01 | 5.097E-01      | 5.072E-02 | 0.040   |
|         | 287.50    |              |     | -3.543E-02          | 5.622E-01 | 9.309E-01      | 9.225E-02 | -0.038  |
|         | 402.40    | *            |     | 1.473E-03           | 1.559E-02 | 2.586E-02      | 2.186E-03 | 0.057   |
| CF-249  | 252.80    |              |     | 2.331E-02           | 3.965E-01 | 6.682E-01      | 6.531E-02 | 0.035   |
|         | 333.37    |              |     | -4.750E-02          | 7.617E-02 | 1.166E-01      | 1.101E-02 | -0.407  |
|         | 388.16    | *            |     | -2.340E-03          | 1.736E-02 | 2.801E-02      | 2.362E-03 | -0.084  |
| CF-251  | 177.52    | *            |     | -1.401E-02          | 5.404E-02 | 8.316E-02      | 7.390E-03 | -0.168  |
|         | 227.38    |              |     | -9.077E-02          | 1.452E-01 | 2.300E-01      | 2.191E-02 | -0.395  |
|         | 285.41    |              |     | 5.462E-02           | 9.626E-01 | 1.613E+00      | 1.601E-01 | 0.034   |
| ANH-511 | 511.00    | *            |     | -2.557E-02          | 3.003E-02 | 5.562E-02      | 5.183E-03 | -0.460  |

# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC
*                                     2040 Savage Road
*                                     Charleston, SC 29414
*****
*
*                               DETECTOR DATA
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054948
* Acquisition date   : 11-MAR-2010 19:26:53 Detector SN#      :
* Detector ID        : GAM20                               Sensitivity      : 5.000
* Geometry           : CAN                                 Energy tolerance: 1.500
* Elapsed live time  : 0 02:00:00.00                      Abundance limit : 75.000
* Elapsed real time  : 0 02:00:31.26                      Half life ratio  : 8.000
*****
*
*                               SAMPLE DATA
*
* Sample date        : 2-MAR-2010 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1202054948 Analyst initials: MXR1
* Batch Number       : 958216 Sample Quantity : 1.4262E+02 GRAM
* Recovery           : 1.00000 Carrier Weight : 0.00000
*****
*
*                               QC DATA
*
* Standard Weight    : 0.00000
* CALIB. DATE/TIME   : 26-AUG-2009 06:32:11 MS Isotope      :
* MSD DPM             : 0.000 MSD Isotope                  :
* LCS DPM             : 0.000 LCS Isotope                   :
* LCSD DPM            : 0.000 LCSD Isotope                  :
*****

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## Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |
|---------|-------------------------------------|--------------------------|--------------------|
|---------|-------------------------------------|--------------------------|--------------------|

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | 9.026E-02                           | 1.328E-01                | 2.464E-01          | 0.000E+00 NOT IDENT. |
| NA-22   | -1.194E-02                          | 1.872E-02                | 2.647E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 9.740E+02                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| K-40    | 5.443E-02                           | 2.125E-01                | 4.061E-01          | 0.000E+00 NOT IDENT. |
| SC-46   | 1.538E-02                           | 1.761E-02                | 3.403E-02          | 0.000E+00 NOT IDENT. |
| V-48    | -2.318E-03                          | 1.991E-02                | 3.289E-02          | 0.000E+00 NOT IDENT. |
| CR-51   | 8.114E-02                           | 1.322E-01                | 2.473E-01          | 0.000E+00 NOT IDENT. |
| MN-54   | -3.994E-03                          | 1.512E-02                | 2.486E-02          | 0.000E+00 NOT IDENT. |
| CO-56   | 0.000E+00                           | 1.784E-02                | 3.776E-02          | 0.000E+00 FAIL ABUN  |
| CO-57   | -1.591E-03                          | 9.687E-03                | 1.656E-02          | 0.000E+00 NOT IDENT. |
| CO-58   | 1.084E-02                           | 1.431E-02                | 2.784E-02          | 0.000E+00 NOT IDENT. |
| FE-59   | -2.555E-02                          | 3.174E-02                | 4.293E-02          | 0.000E+00 NOT IDENT. |
| CO-60   | -1.214E-02                          | 1.779E-02                | 2.420E-02          | 0.000E+00 NOT IDENT. |
| ZN-65   | -1.331E-02                          | 3.552E-02                | 5.510E-02          | 0.000E+00 NOT IDENT. |
| SE-75   | -1.394E-03                          | 1.771E-02                | 3.126E-02          | 0.000E+00 NOT IDENT. |
| SR-85   | -7.222E-02                          | 3.146E-02                | 4.294E-02          | 0.000E+00 NOT IDENT. |
| Y-88    | 5.420E-03                           | 1.640E-02                | 3.014E-02          | 0.000E+00 NOT IDENT. |
| Y-91    | 3.381E+00                           | 7.136E+00                | 1.308E+01          | 0.000E+00 NOT IDENT. |
| NB-94   | 9.331E-03                           | 1.592E-02                | 2.976E-02          | 0.000E+00 NOT IDENT. |
| NB-95   | -1.017E-02                          | 1.760E-02                | 2.724E-02          | 0.000E+00 NOT IDENT. |
| NB-95M  | -6.536E-02                          | 5.321E-02                | 8.298E-02          | 0.000E+00 NOT IDENT. |
| ZR-95   | 1.108E-02                           | 2.813E-02                | 5.177E-02          | 0.000E+00 NOT IDENT. |
| MO-99   | 1.059E+00                           | 1.555E+00                | 2.929E+00          | 0.000E+00 NOT IDENT. |
| TC-99M  | 0.000E+00                           | 7.244E+09                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| RU-103  | 3.385E-03                           | 1.580E-02                | 2.766E-02          | 0.000E+00 NOT IDENT. |
| RH-106  | 1.587E-02                           | 1.548E-01                | 2.620E-01          | 0.000E+00 NOT IDENT. |



|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| RU-106  | 1.587E-02  | 1.548E-01 | 2.620E-01 | 0.000E+00 | NOT IDENT. |
| AG-108M | 4.115E-03  | 1.271E-02 | 2.274E-02 | 0.000E+00 | NOT IDENT. |
| CD-109  | 7.335E-02  | 2.874E-01 | 4.659E-01 | 0.000E+00 | NOT IDENT. |
| AG-110M | 3.625E-03  | 1.444E-02 | 2.624E-02 | 0.000E+00 | NOT IDENT. |
| SN-113  | 1.362E-04  | 1.703E-02 | 2.951E-02 | 0.000E+00 | NOT IDENT. |
| CD-115  | 1.622E-02  | 9.253E-01 | 1.569E+00 | 0.000E+00 | NOT IDENT. |
| SN-117M | 7.899E-03  | 1.701E-02 | 3.032E-02 | 0.000E+00 | NOT IDENT. |
| TE-123M | 5.186E-03  | 1.071E-02 | 1.916E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | -7.395E-03 | 3.759E-02 | 5.994E-02 | 0.000E+00 | NOT IDENT. |
| SB-125  | 1.411E-03  | 3.902E-02 | 6.739E-02 | 0.000E+00 | NOT IDENT. |
| TE-125M | -8.600E-01 | 3.527E+00 | 6.031E+00 | 0.000E+00 | NOT IDENT. |
| I-126   | -2.924E-02 | 7.395E-02 | 1.226E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | -2.181E-02 | 3.908E-02 | 6.115E-02 | 0.000E+00 | NOT IDENT. |
| SN-126  | -2.541E-04 | 2.928E-02 | 4.618E-02 | 0.000E+00 | NOT IDENT. |
| SB-127  | 7.784E-02  | 2.047E-01 | 3.783E-01 | 0.000E+00 | NOT IDENT. |
| I-131   | -6.855E-03 | 3.784E-02 | 6.464E-02 | 0.000E+00 | NOT IDENT. |
| TE-132  | -7.541E-02 | 9.451E-02 | 1.563E-01 | 0.000E+00 | NOT IDENT. |
| BA-133  | -1.507E-02 | 1.814E-02 | 2.828E-02 | 0.000E+00 | NOT IDENT. |
| I-133   | 0.000E+00  | 3.586E+01 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | 5.144E-03  | 1.859E-02 | 3.354E-02 | 0.000E+00 | NOT IDENT. |
| CS-135  | 3.025E-04  | 6.021E-02 | 1.071E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 3.716E+09 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -2.333E-02 | 3.626E-02 | 5.344E-02 | 0.000E+00 | NOT IDENT. |
| BA-137M | -4.280E-03 | 1.521E-02 | 2.563E-02 | 0.000E+00 | NOT IDENT. |
| CS-137  | -4.522E-03 | 1.607E-02 | 2.708E-02 | 0.000E+00 | NOT IDENT. |
| CE-139  | -9.546E-03 | 1.207E-02 | 1.889E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | 7.873E-03  | 7.900E-02 | 1.355E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | 1.022E-02  | 3.125E-02 | 5.701E-02 | 0.000E+00 | NOT IDENT. |
| CE-141  | 1.851E-02  | 2.220E-02 | 4.092E-02 | 0.000E+00 | NOT IDENT. |
| CE-143  | 1.565E+00  | 3.823E+00 | 6.980E+00 | 0.000E+00 | NOT IDENT. |
| CE-144  | -3.315E-03 | 7.655E-02 | 1.317E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | 2.082E-03  | 1.622E-02 | 2.880E-02 | 0.000E+00 | NOT IDENT. |
| PR-144  | 1.484E-01  | 1.209E+00 | 2.146E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | -6.699E-03 | 1.823E-02 | 2.958E-02 | 0.000E+00 | NOT IDENT. |
| ND-147  | 4.182E-02  | 1.712E-01 | 3.000E-01 | 0.000E+00 | NOT IDENT. |
| PM-149  | -2.402E+00 | 7.498E+00 | 1.283E+01 | 0.000E+00 | NOT IDENT. |
| EU-152  | -3.489E-02 | 3.971E-02 | 6.158E-02 | 0.000E+00 | NOT IDENT. |
| GD-153  | 5.204E-03  | 3.178E-02 | 5.084E-02 | 0.000E+00 | NOT IDENT. |
| EU-154  | -2.977E-02 | 5.162E-02 | 7.386E-02 | 0.000E+00 | NOT IDENT. |
| EU-155  | -4.099E-02 | 3.862E-02 | 5.681E-02 | 0.000E+00 | NOT IDENT. |
| TB-160  | -2.337E-02 | 7.106E-02 | 1.065E-01 | 0.000E+00 | NOT IDENT. |
| HO-166M | -9.082E-03 | 2.582E-02 | 4.265E-02 | 0.000E+00 | NOT IDENT. |
| TA-182  | -1.540E-02 | 6.259E-02 | 9.793E-02 | 0.000E+00 | NOT IDENT. |
| IR-192  | -3.204E-03 | 1.388E-02 | 2.377E-02 | 0.000E+00 | NOT IDENT. |
| HG-203  | -4.771E-03 | 1.411E-02 | 2.412E-02 | 0.000E+00 | NOT IDENT. |
| BI-207  | 1.027E-02  | 2.320E-02 | 4.215E-02 | 0.000E+00 | NOT IDENT. |
| TL-208  | -2.182E-02 | 1.901E-02 | 2.536E-02 | 0.000E+00 | NOT IDENT. |
| PB-210  | -5.129E-01 | 8.526E-01 | 1.438E+00 | 0.000E+00 | NOT IDENT. |
| BI-211  | 2.821E-02  | 9.892E-02 | 1.652E-01 | 0.000E+00 | NOT IDENT. |
| PB-211  | -2.045E-01 | 3.091E-01 | 4.588E-01 | 0.000E+00 | NOT IDENT. |
| BI-212  | 1.246E-01  | 2.303E-01 | 4.270E-01 | 0.000E+00 | NOT IDENT. |
| PB-212  | -1.044E-02 | 2.901E-02 | 5.073E-02 | 0.000E+00 | NOT IDENT. |
| BI-214  | -1.656E-02 | 4.075E-02 | 6.231E-02 | 0.000E+00 | NOT IDENT. |
| PB-214  | 1.691E-02  | 3.558E-02 | 6.048E-02 | 0.000E+00 | NOT IDENT. |
| RN-219  | 6.419E-02  | 1.642E-01 | 2.974E-01 | 0.000E+00 | NOT IDENT. |
| RA-223  | -2.266E-01 | 2.755E-01 | 4.338E-01 | 0.000E+00 | NOT IDENT. |
| RA-224  | -3.579E-01 | 2.782E-01 | 4.410E-01 | 0.000E+00 | NOT IDENT. |
| RA-226  | -1.656E-02 | 4.075E-02 | 6.231E-02 | 0.000E+00 | NOT IDENT. |
| AC-227  | 9.977E-03  | 1.048E-01 | 1.885E-01 | 0.000E+00 | NOT IDENT. |
| TH-227  | 9.977E-03  | 1.048E-01 | 1.885E-01 | 0.000E+00 | NOT IDENT. |
| AC-228  | 2.259E-02  | 6.397E-02 | 1.189E-01 | 0.000E+00 | NOT IDENT. |
| RA-228  | 2.259E-02  | 6.397E-02 | 1.189E-01 | 0.000E+00 | NOT IDENT. |
| TH-228  | -1.044E-02 | 2.901E-02 | 5.073E-02 | 0.000E+00 | NOT IDENT. |
| TH-229  | 8.977E-03  | 1.881E-01 | 3.428E-01 | 0.000E+00 | NOT IDENT. |
| PA-231  | 2.674E-01  | 5.780E-01 | 1.069E+00 | 0.000E+00 | NOT IDENT. |
| TH-231  | -2.266E-01 | 2.755E-01 | 4.338E-01 | 0.000E+00 | NOT IDENT. |
| TH-232  | 2.259E-02  | 6.397E-02 | 1.189E-01 | 0.000E+00 | NOT IDENT. |
| PA-233  | -2.551E-03 | 2.790E-02 | 4.861E-02 | 0.000E+00 | NOT IDENT. |
| PA-234  | -5.034E-02 | 1.259E-01 | 1.973E-01 | 0.000E+00 | NOT IDENT. |
| PA-234M | 1.976E+00  | 2.387E+00 | 4.539E+00 | 0.000E+00 | NOT IDENT. |
| TH-234  | 5.384E-02  | 4.359E-01 | 8.478E-01 | 0.000E+00 | FAIL ABUN  |
| U-235   | 7.261E-02  | 8.753E-02 | 1.546E-01 | 0.000E+00 | FAIL ABUN  |
| NP-237  | 2.461E-02  | 7.687E-02 | 1.392E-01 | 0.000E+00 | NOT IDENT. |
| U-238   | 5.384E-02  | 4.359E-01 | 8.478E-01 | 0.000E+00 | FAIL ABUN  |
| NP-239  | -4.321E-02 | 1.412E-01 | 2.380E-01 | 0.000E+00 | NOT IDENT. |
| AM-241  | -8.496E-03 | 3.831E-02 | 6.768E-02 | 0.000E+00 | NOT IDENT. |
| CM-247  | 1.473E-03  | 1.528E-02 | 2.672E-02 | 0.000E+00 | NOT IDENT. |
| CF-249  | -2.340E-03 | 1.702E-02 | 2.897E-02 | 0.000E+00 | NOT IDENT. |

|         |            |           |           |                      |
|---------|------------|-----------|-----------|----------------------|
| CF-251  | -1.401E-02 | 5.296E-02 | 8.742E-02 | 0.000E+00 NOT IDENT. |
| ANH-511 | -2.557E-02 | 2.943E-02 | 5.718E-02 | 0.000E+00 NOT IDENT. |

VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 21:29:09.33

```
*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054948.CNF;1
Sample date        : 2-MAR-2010 00:00:00. Acquisition date : 11-MAR-2010 19:26:53
Sample ID          : G1202054948      Sample quantity   : 1.42620E+02 GRAM
Detector name      : GAM20             Detector geometry: CAN
Elapsed live time  : 0 02:00:00.00     Elapsed real time: 0 02:00:31.26  0.4%
Energy tolerance   : 1.50000 keV       Analyst Initials : MXR1
Abundance limit    : 75.00000          Sensitivity       : 5.00000
Batch ID           : 958216            Detector SN#      :
Matrix Spike ID    :                   LCS ID           : 1032-A
*****
```

Nuclide Line Activity Report

Flag: "\*" = Keyline

Summary of Nuclide Activity  
Sample ID : G1202054948

Page : 2  
Acquisition date : 11-MAR-2010 19:26:53

|   |   |
|---|---|
| Total number of lines in spectrum             | 3 |
| Number of unidentified lines                  | 1 |
| Number of lines tentatively identified by NID | 2 |
| 66.67%  |   |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : G1202054948

Page : 3  
Acquisition date : 11-MAR-2010 19:26:53

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 92.99   | 47   | 104   | 1.10 | 185.88  | 180  | 11 | 6.52E-03 | **** | 7.17E+00 | T     |
| 0  | 846.13  | 28   | 3     | 1.88 | 1690.95 | 1686 | 10 | 3.95E-03 | 42.9 | 1.98E+00 | T     |
| 0  | 1040.55 | 10   | 4     | 1.33 | 2079.80 | 2075 | 8  | 1.39E-03 | 93.8 | 1.66E+00 |       |

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC
*                                     2040 Savage Road
*                                     Charleston, SC 29414
*****
*
*                               DETECTOR DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054948.CNF;1
* Acquisition date   : 11-MAR-2010 19:26:53   Detector SN#      :
* Detector ID        : GAM20                   Sensitivity         : 5.00000
* Geometry           : CAN                     Energy tolerance    : 1.50000
* Elapsed live time  : 0 02:00:00.00           Abundance limit     : 75.00000
* Elapsed real time  : 0 02:00:31.26           Half life ratio     : 8.00000
*****
*
*                               SAMPLE DATA
*
* Sample date        : 2-MAR-2010 00:00:00.   Nuclide Library   : SOLID
* Sample ID          : G1202054948           Analyst initials  : MXR1
* Batch Number       : 958216                Sample Quantity   : 1.42620E+02 GRAM
*****
*
*                               QC DATA
*
* CALIB. DATE/TIME   : 26-AUG-2009 06:32:11.7MS Isotope      :
* MSD ID              :                      MSD Isotope      :
* LCS ID              : 1032-A               LCS Isotope         :
*****

```

## Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | 9.026E-02                          |              | 1.355E-01 | 2.393E-01           | 2.326E-02 | 0.377   |
| NA-22   | -1.194E-02                         |              | 1.910E-02 | 2.627E-02           | 2.176E-03 | -0.455  |
| NA-24   | 6.833E-05                          |              | 4.969E-04 | Half-Life too short |           |         |
| K-40    | 5.443E-02                          |              | 2.168E-01 | 4.042E-01           | 3.525E-02 | 0.135   |
| SC-46   | 1.538E-02                          |              | 1.797E-02 | 3.350E-02           | 3.340E-03 | 0.459   |
| V-48    | -2.318E-03                         |              | 2.031E-02 | 3.245E-02           | 3.102E-03 | -0.071  |
| CR-51   | 8.114E-02                          |              | 1.349E-01 | 2.381E-01           | 2.386E-02 | 0.341   |
| MN-54   | -3.994E-03                         |              | 1.542E-02 | 2.444E-02           | 2.469E-03 | -0.163  |
| CO-56   | 4.132E-02                          | +            | 1.820E-02 | 3.714E-02           | 3.743E-03 | 1.113   |
| CO-57   | -1.591E-03                         |              | 9.884E-03 | 1.564E-02           | 1.305E-03 | -0.102  |
| CO-58   | 1.084E-02                          |              | 1.460E-02 | 2.735E-02           | 2.777E-03 | 0.396   |
| FE-59   | -2.555E-02                         |              | 3.239E-02 | 4.246E-02           | 4.004E-03 | -0.602  |
| CO-60   | -1.214E-02                         |              | 1.815E-02 | 2.404E-02           | 2.014E-03 | -0.505  |
| ZN-65   | -1.331E-02                         |              | 3.625E-02 | 5.452E-02           | 4.693E-03 | -0.244  |
| SE-75   | -1.394E-03                         |              | 1.807E-02 | 2.998E-02           | 2.969E-03 | -0.047  |
| SR-85   | -7.222E-02                         |              | 3.210E-02 | 4.178E-02           | 3.901E-03 | -1.729  |
| Y-88    | 5.420E-03                          |              | 1.673E-02 | 3.016E-02           | 2.433E-03 | 0.180   |

----- Non-Identified Nuclides -----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| Y-91    | 3.381E+00                          |              | 7.282E+00 | 1.296E+01         | 1.052E+00 | 0.261   |
| NB-94   | 9.331E-03                          |              | 1.625E-02 | 2.915E-02         | 2.949E-03 | 0.320   |
| NB-95   | -1.017E-02                         |              | 1.796E-02 | 2.673E-02         | 2.716E-03 | -0.380  |
| NB-95M  | -6.536E-02                         |              | 5.430E-02 | 7.941E-02         | 8.546E-03 | -0.823  |
| ZR-95   | 1.108E-02                          |              | 2.871E-02 | 5.078E-02         | 5.555E-03 | 0.218   |
| MO-99   | 1.059E+00                          |              | 1.587E+00 | 2.872E+00         | 4.781E-01 | 0.369   |
| TC-99M  | -8.772E+03                         |              | 3.696E+03 | Half-Life         | too short |         |
| RU-103  | 3.385E-03                          |              | 1.613E-02 | 2.689E-02         | 3.858E-03 | 0.126   |
| RH-106  | 1.587E-02                          |              | 1.580E-01 | 2.560E-01         | 3.614E-02 | 0.062   |
| RU-106  | 1.587E-02                          |              | 1.579E-01 | 2.560E-01         | 2.534E-02 | 0.062   |
| AG-108M | 4.115E-03                          |              | 1.297E-02 | 2.204E-02         | 1.987E-03 | 0.187   |
| CD-109  | 7.335E-02                          |              | 2.933E-01 | 4.369E-01         | 4.132E-02 | 0.168   |
| AG-110M | 3.625E-03                          |              | 1.474E-02 | 2.566E-02         | 2.629E-03 | 0.141   |
| SN-113  | 1.362E-04                          |              | 1.738E-02 | 2.854E-02         | 2.462E-03 | 0.005   |
| CD-115  | 1.622E-02                          |              | 9.442E-01 | 1.527E+00         | 1.440E-01 | 0.011   |
| SN-117M | 7.899E-03                          |              | 1.736E-02 | 2.878E-02         | 2.484E-03 | 0.274   |
| TE-123M | 5.186E-03                          |              | 1.093E-02 | 1.819E-02         | 1.580E-03 | 0.285   |
| SB-124  | -7.395E-03                         |              | 3.836E-02 | 5.986E-02         | 5.215E-03 | -0.124  |
| SB-125  | 1.411E-03                          |              | 3.981E-02 | 6.531E-02         | 5.777E-03 | 0.022   |
| TE-125M | -8.600E-01                         |              | 3.599E+00 | 5.681E+00         | 5.889E-01 | -0.151  |
| I-126   | -2.924E-02                         |              | 7.546E-02 | 1.200E-01         | 1.205E-02 | -0.244  |
| SB-126  | -2.181E-02                         |              | 3.988E-02 | 5.993E-02         | 6.077E-03 | -0.364  |
| SN-126  | -2.541E-04                         |              | 2.988E-02 | 4.331E-02         | 4.073E-03 | -0.006  |
| SB-127  | 7.784E-02                          |              | 2.089E-01 | 3.703E-01         | 4.185E-02 | 0.210   |
| I-131   | -6.855E-03                         |              | 3.862E-02 | 6.243E-02         | 5.836E-03 | -0.110  |
| TE-132  | -7.541E-02                         |              | 9.644E-02 | 1.495E-01         | 2.315E-02 | -0.505  |
| BA-133  | -1.507E-02                         |              | 1.851E-02 | 2.730E-02         | 3.621E-03 | -0.552  |
| I-133   | 4.748E-06                          |              | 1.830E-05 | Half-Life         | too short |         |
| CS-134  | 5.144E-03                          |              | 1.897E-02 | 3.294E-02         | 3.361E-03 | 0.156   |
| CS-135  | 3.025E-04                          |              | 6.144E-02 | 1.027E-01         | 1.138E-02 | 0.003   |
| I-135   | -1.702E+02                         |              | 1.896E+03 | Half-Life         | too short |         |
| CS-136  | -2.333E-02                         |              | 3.700E-02 | 5.280E-02         | 5.007E-03 | -0.442  |
| BA-137M | -4.280E-03                         |              | 1.552E-02 | 2.507E-02         | 2.516E-03 | -0.171  |
| CS-137  | -4.522E-03                         |              | 1.640E-02 | 2.649E-02         | 2.662E-03 | -0.171  |
| CE-139  | -9.546E-03                         |              | 1.231E-02 | 1.795E-02         | 1.567E-03 | -0.532  |
| BA-140  | 7.873E-03                          |              | 8.061E-02 | 1.320E-01         | 4.506E-02 | 0.060   |
| LA-140  | 1.022E-02                          |              | 3.188E-02 | 5.686E-02         | 4.801E-03 | 0.180   |
| CE-141  | 1.851E-02                          |              | 2.265E-02 | 3.877E-02         | 3.348E-03 | 0.477   |
| CE-143  | 1.565E+00                          |              | 3.901E+00 | 6.710E+00         | 1.474E+00 | 0.233   |
| CE-144  | -3.315E-03                         |              | 7.811E-02 | 1.246E-01         | 1.887E-02 | -0.027  |
| PM-144  | 2.082E-03                          |              | 1.655E-02 | 2.820E-02         | 2.851E-03 | 0.074   |
| PR-144  | 1.484E-01                          |              | 1.234E+00 | 2.102E+00         | 2.124E-01 | 0.071   |
| PM-146  | -6.699E-03                         |              | 1.860E-02 | 2.870E-02         | 3.106E-03 | -0.233  |
| ND-147  | 4.182E-02                          |              | 1.747E-01 | 2.920E-01         | 4.509E-02 | 0.143   |
| PM-149  | -2.402E+00                         |              | 7.651E+00 | 1.233E+01         | 2.007E+00 | -0.195  |
| EU-152  | -3.489E-02                         |              | 4.052E-02 | 5.940E-02         | 5.794E-03 | -0.587  |
| GD-153  | 5.204E-03                          |              | 3.243E-02 | 4.778E-02         | 4.237E-03 | 0.109   |
| EU-154  | -2.977E-02                         |              | 5.267E-02 | 7.330E-02         | 8.150E-03 | -0.406  |

----- Non-Identified Nuclides -----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| EU-155  | -4.099E-02                         |              | 3.941E-02 | 5.348E-02         | 4.647E-03 | -0.767  |
| TB-160  | -2.337E-02                         |              | 7.251E-02 | 1.048E-01         | 1.048E-02 | -0.223  |
| HO-166M | -9.082E-03                         |              | 2.635E-02 | 4.179E-02         | 4.233E-03 | -0.217  |
| TA-182  | -1.540E-02                         |              | 6.387E-02 | 9.709E-02         | 7.922E-03 | -0.159  |
| IR-192  | -3.204E-03                         |              | 1.417E-02 | 2.289E-02         | 2.214E-03 | -0.140  |
| HG-203  | -4.771E-03                         |              | 1.440E-02 | 2.316E-02         | 2.351E-03 | -0.206  |
| BI-207  | 1.027E-02                          |              | 2.367E-02 | 4.166E-02         | 3.761E-03 | 0.246   |
| TL-208  | -2.182E-02                         |              | 1.940E-02 | 2.474E-02         | 2.541E-03 | -0.882  |
| PB-210  | -5.129E-01                         |              | 8.700E-01 | 1.332E+00         | 1.224E-01 | -0.385  |
| BI-211  | 2.821E-02                          |              | 1.009E-01 | 1.594E-01         | 1.527E-02 | 0.177   |
| PB-211  | -2.045E-01                         |              | 3.154E-01 | 4.441E-01         | 2.148E-01 | -0.460  |
| BI-212  | 1.246E-01                          |              | 2.350E-01 | 4.185E-01         | 5.675E-02 | 0.298   |
| PB-212  | -1.044E-02                         |              | 2.960E-02 | 4.856E-02         | 5.185E-03 | -0.215  |
| BI-214  | -1.656E-02                         |              | 4.158E-02 | 6.084E-02         | 6.797E-03 | -0.272  |
| PB-214  | 1.691E-02                          |              | 3.630E-02 | 5.837E-02         | 6.446E-03 | 0.290   |
| RN-219  | 6.419E-02                          |              | 1.675E-01 | 2.878E-01         | 4.253E-02 | 0.223   |
| RA-223  | -2.266E-01                         |              | 2.811E-01 | 4.179E-01         | 7.448E-02 | -0.542  |
| RA-224  | -3.579E-01                         |              | 2.839E-01 | 4.222E-01         | 4.081E-02 | -0.848  |
| RA-226  | -1.656E-02                         |              | 4.158E-02 | 6.084E-02         | 6.797E-03 | -0.272  |
| AC-227  | 9.977E-03                          |              | 1.070E-01 | 1.807E-01         | 2.335E-02 | 0.055   |
| TH-227  | 9.977E-03                          |              | 1.070E-01 | 1.807E-01         | 2.599E-02 | 0.055   |
| AC-228  | 2.259E-02                          |              | 6.528E-02 | 1.171E-01         | 1.472E-02 | 0.193   |
| RA-228  | 2.259E-02                          |              | 6.528E-02 | 1.171E-01         | 1.472E-02 | 0.193   |
| TH-228  | -1.044E-02                         |              | 2.960E-02 | 4.856E-02         | 5.185E-03 | -0.215  |
| TH-229  | 8.977E-03                          |              | 1.920E-01 | 3.267E-01         | 2.975E-02 | 0.027   |
| PA-231  | 2.674E-01                          |              | 5.898E-01 | 1.027E+00         | 1.582E-01 | 0.260   |
| TH-231  | -2.266E-01                         |              | 2.811E-01 | 4.179E-01         | 7.448E-02 | -0.542  |
| TH-232  | 2.259E-02                          |              | 6.528E-02 | 1.171E-01         | 1.472E-02 | 0.193   |
| PA-233  | -2.551E-03                         |              | 2.847E-02 | 4.679E-02         | 4.643E-03 | -0.055  |
| PA-234  | -5.034E-02                         |              | 1.285E-01 | 1.945E-01         | 3.756E-02 | -0.259  |
| PA-234M | 1.976E+00                          |              | 2.436E+00 | 4.481E+00         | 4.793E-01 | 0.441   |
| TH-234  | 5.384E-02                          |              | 4.448E-01 | 7.899E-01         | 1.403E-01 | 0.068   |
| U-235   | 7.261E-02                          |              | 8.932E-02 | 1.465E-01         | 2.471E-02 | 0.496   |
| NP-237  | 2.461E-02                          |              | 7.844E-02 | 1.305E-01         | 2.992E-02 | 0.189   |
| U-238   | 5.384E-02                          |              | 4.448E-01 | 7.899E-01         | 1.403E-01 | 0.068   |
| NP-239  | -4.321E-02                         |              | 1.440E-01 | 2.245E-01         | 1.880E-02 | -0.192  |
| AM-241  | -8.496E-03                         |              | 3.909E-02 | 6.298E-02         | 4.928E-03 | -0.135  |
| CM-247  | 1.473E-03                          |              | 1.559E-02 | 2.586E-02         | 2.186E-03 | 0.057   |
| CF-249  | -2.340E-03                         |              | 1.736E-02 | 2.801E-02         | 2.362E-03 | -0.084  |
| CF-251  | -1.401E-02                         |              | 5.404E-02 | 8.316E-02         | 7.390E-03 | -0.168  |
| ANH-511 | -2.557E-02                         |              | 3.003E-02 | 5.562E-02         | 5.183E-03 | -0.460  |



# VAX/VMS Nuclide Identification Report Generated

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29414                           *
*****
*                               DETECTOR DATA                               *
*
* Configuration      : SYSSYSROOT:[ALPHA.ARCHIVE.GAMMA]G1202054948             *
* Acquisition date   : 11-MAR-2010 19:26:53 Detector SN#      :               *
* Detector ID        : GAM20                      Sensitivity   : 5.000         *
* Geometry           : CAN                        Energy tolerance: 1.500         *
* Elapsed live time  : 0 02:00:00.00             Abundance limit : 75.000         *
* Elapsed real time  : 0 02:00:31.26             Half life ratio : 8.000         *
*****
*                               SAMPLE DATA                               *
*
* Sample date        : 2-MAR-2010 00:00:00 Nuclide Library : SOLID             *
* Sample ID          : G1202054948              Analyst initials: MXR1          *
* Batch Number       : 958216                   Sample Quantity : 1.4262E+02 GRAM    *
* Recovery           : 1.00000                  Carrier Weight  : 0.00000         *
*****
*                               QC DATA                               *
*
* CALIB. DATE/TIME  : 26-AUG-2009 06:32:11 MS Isotope       :               *
* MSD DPM           : 0.000                      MSD Isotope   :               *
* LCS DPM           : 0.000                      LCS Isotope   :               *
* LCSD DPM          : 0.000                      LCSD Isotope  :               *
*****

```

## Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide                           | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act Error | DLC<br>(pCi/GRAM ) | TPU                  |
|-----------------------------------|-------------------------------------|---------------|--------------------|----------------------|
| ---- Non-Identified Nuclides ---- |                                     |               |                    |                      |
| BE-7                              | 9.026E-02                           | 1.328E-01     | 1.233E-01          | 6.777E-02 NOT IDENT. |
| NA-22                             | -1.194E-02                          | 1.872E-02     | 1.324E-02          | 9.549E-03 NOT IDENT. |
| NA-24                             | 6.833E+01                           | 9.740E+02     | 0.000E+00          | 4.969E+02 SHORT HLIF |
| K-40                              | 5.443E-02                           | 2.125E-01     | 2.032E-01          | 1.084E-01 NOT IDENT. |
| SC-46                             | 1.538E-02                           | 1.761E-02     | 1.703E-02          | 8.985E-03 NOT IDENT. |
| V-48                              | -2.318E-03                          | 1.991E-02     | 1.645E-02          | 1.016E-02 NOT IDENT. |
| CR-51                             | 8.114E-02                           | 1.322E-01     | 1.237E-01          | 6.746E-02 NOT IDENT. |
| MN-54                             | -3.994E-03                          | 1.512E-02     | 1.244E-02          | 7.712E-03 NOT IDENT. |
| CO-56                             | 4.132E-02                           | 1.784E-02     | 1.889E-02          | 9.100E-03 FAIL ABUN  |
| CO-57                             | -1.591E-03                          | 9.687E-03     | 8.286E-03          | 4.942E-03 NOT IDENT. |
| CO-58                             | 1.084E-02                           | 1.431E-02     | 1.393E-02          | 7.301E-03 NOT IDENT. |
| FE-59                             | -2.555E-02                          | 3.174E-02     | 2.148E-02          | 1.620E-02 NOT IDENT. |
| CO-60                             | -1.214E-02                          | 1.779E-02     | 1.211E-02          | 9.075E-03 NOT IDENT. |
| ZN-65                             | -1.331E-02                          | 3.552E-02     | 2.757E-02          | 1.812E-02 NOT IDENT. |
| SE-75                             | -1.394E-03                          | 1.771E-02     | 1.564E-02          | 9.035E-03 NOT IDENT. |
| SR-85                             | -7.222E-02                          | 3.146E-02     | 2.148E-02          | 1.605E-02 NOT IDENT. |
| Y-88                              | 5.420E-03                           | 1.640E-02     | 1.508E-02          | 8.367E-03 NOT IDENT. |
| Y-91                              | 3.381E+00                           | 7.136E+00     | 6.541E+00          | 3.641E+00 NOT IDENT. |
| NB-94                             | 9.331E-03                           | 1.592E-02     | 1.489E-02          | 8.123E-03 NOT IDENT. |
| NB-95                             | -1.017E-02                          | 1.760E-02     | 1.363E-02          | 8.980E-03 NOT IDENT. |
| NB-95M                            | -6.536E-02                          | 5.321E-02     | 4.152E-02          | 2.715E-02 NOT IDENT. |
| ZR-95                             | 1.108E-02                           | 2.813E-02     | 2.590E-02          | 1.435E-02 NOT IDENT. |
| MO-99                             | 1.059E+00                           | 1.555E+00     | 1.465E+00          | 7.935E-01 NOT IDENT. |
| TC-99M                            | -8.772E+09                          | 7.244E+09     | 0.000E+00          | 3.696E+09 SHORT HLIF |
| RU-103                            | 3.385E-03                           | 1.580E-02     | 1.384E-02          | 8.063E-03 NOT IDENT. |
| RH-106                            | 1.587E-02                           | 1.548E-01     | 1.311E-01          | 7.898E-02 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| RU-106  | 1.587E-02  | 1.548E-01 | 1.311E-01 | 7.897E-02 | NOT IDENT. |
| AG-108M | 4.115E-03  | 1.271E-02 | 1.138E-02 | 6.485E-03 | NOT IDENT. |
| CD-109  | 7.335E-02  | 2.874E-01 | 2.331E-01 | 1.466E-01 | NOT IDENT. |
| AG-110M | 3.625E-03  | 1.444E-02 | 1.313E-02 | 7.368E-03 | NOT IDENT. |
| SN-113  | 1.362E-04  | 1.703E-02 | 1.476E-02 | 8.690E-03 | NOT IDENT. |
| CD-115  | 1.622E-02  | 9.253E-01 | 7.850E-01 | 4.721E-01 | NOT IDENT. |
| SN-117M | 7.899E-03  | 1.701E-02 | 1.517E-02 | 8.678E-03 | NOT IDENT. |
| TE-123M | 5.186E-03  | 1.071E-02 | 9.586E-03 | 5.464E-03 | NOT IDENT. |
| SB-124  | -7.395E-03 | 3.759E-02 | 2.999E-02 | 1.918E-02 | NOT IDENT. |
| SB-125  | 1.411E-03  | 3.902E-02 | 3.372E-02 | 1.991E-02 | NOT IDENT. |
| TE-125M | -8.600E-01 | 3.527E+00 | 3.017E+00 | 1.800E+00 | NOT IDENT. |
| I-126   | -2.924E-02 | 7.395E-02 | 6.135E-02 | 3.773E-02 | NOT IDENT. |
| SB-126  | -2.181E-02 | 3.908E-02 | 3.060E-02 | 1.994E-02 | NOT IDENT. |
| SN-126  | -2.541E-04 | 2.928E-02 | 2.310E-02 | 1.494E-02 | NOT IDENT. |
| SB-127  | 7.784E-02  | 2.047E-01 | 1.893E-01 | 1.044E-01 | NOT IDENT. |
| I-131   | -6.855E-03 | 3.784E-02 | 3.234E-02 | 1.931E-02 | NOT IDENT. |
| TE-132  | -7.541E-02 | 9.451E-02 | 7.820E-02 | 4.822E-02 | NOT IDENT. |
| BA-133  | -1.507E-02 | 1.814E-02 | 1.415E-02 | 9.254E-03 | NOT IDENT. |
| I-133   | 4.748E+00  | 3.586E+01 | 0.000E+00 | 1.830E+01 | SHORT HLIF |
| CS-134  | 5.144E-03  | 1.859E-02 | 1.678E-02 | 9.483E-03 | NOT IDENT. |
| CS-135  | 3.025E-04  | 6.021E-02 | 5.357E-02 | 3.072E-02 | NOT IDENT. |
| I-135   | -1.702E+08 | 3.716E+09 | 0.000E+00 | 1.896E+09 | SHORT HLIF |
| CS-136  | -2.333E-02 | 3.626E-02 | 2.674E-02 | 1.850E-02 | NOT IDENT. |
| BA-137M | -4.280E-03 | 1.521E-02 | 1.282E-02 | 7.762E-03 | NOT IDENT. |
| CS-137  | -4.522E-03 | 1.607E-02 | 1.355E-02 | 8.199E-03 | NOT IDENT. |
| CE-139  | -9.546E-03 | 1.207E-02 | 9.452E-03 | 6.157E-03 | NOT IDENT. |
| BA-140  | 7.873E-03  | 7.900E-02 | 6.781E-02 | 4.030E-02 | NOT IDENT. |
| LA-140  | 1.022E-02  | 3.125E-02 | 2.852E-02 | 1.594E-02 | NOT IDENT. |
| CE-141  | 1.851E-02  | 2.220E-02 | 2.047E-02 | 1.133E-02 | NOT IDENT. |
| CE-143  | 1.565E+00  | 3.823E+00 | 3.492E+00 | 1.951E+00 | NOT IDENT. |
| CE-144  | -3.315E-03 | 7.655E-02 | 6.588E-02 | 3.905E-02 | NOT IDENT. |
| PM-144  | 2.082E-03  | 1.622E-02 | 1.441E-02 | 8.274E-03 | NOT IDENT. |
| PR-144  | 1.484E-01  | 1.209E+00 | 1.074E+00 | 6.170E-01 | NOT IDENT. |
| PM-146  | -6.699E-03 | 1.823E-02 | 1.480E-02 | 9.302E-03 | NOT IDENT. |
| ND-147  | 4.182E-02  | 1.712E-01 | 1.501E-01 | 8.734E-02 | NOT IDENT. |
| PM-149  | -2.402E+00 | 7.498E+00 | 6.418E+00 | 3.825E+00 | NOT IDENT. |
| EU-152  | -3.489E-02 | 3.971E-02 | 3.081E-02 | 2.026E-02 | NOT IDENT. |
| GD-153  | 5.204E-03  | 3.178E-02 | 2.543E-02 | 1.622E-02 | NOT IDENT. |
| EU-154  | -2.977E-02 | 5.162E-02 | 3.695E-02 | 2.634E-02 | NOT IDENT. |
| EU-155  | -4.099E-02 | 3.862E-02 | 2.842E-02 | 1.971E-02 | NOT IDENT. |
| TB-160  | -2.337E-02 | 7.106E-02 | 5.326E-02 | 3.625E-02 | NOT IDENT. |
| HO-166M | -9.082E-03 | 2.582E-02 | 2.134E-02 | 1.317E-02 | NOT IDENT. |
| TA-182  | -1.540E-02 | 6.259E-02 | 4.899E-02 | 3.194E-02 | NOT IDENT. |
| IR-192  | -3.204E-03 | 1.388E-02 | 1.189E-02 | 7.084E-03 | NOT IDENT. |
| HG-203  | -4.771E-03 | 1.411E-02 | 1.207E-02 | 7.199E-03 | NOT IDENT. |
| BI-207  | 1.027E-02  | 2.320E-02 | 2.109E-02 | 1.184E-02 | NOT IDENT. |
| TL-208  | -2.182E-02 | 1.901E-02 | 1.269E-02 | 9.699E-03 | NOT IDENT. |
| PB-210  | -5.129E-01 | 8.526E-01 | 7.197E-01 | 4.350E-01 | NOT IDENT. |
| BI-211  | 2.821E-02  | 9.892E-02 | 8.265E-02 | 5.047E-02 | NOT IDENT. |
| PB-211  | -2.045E-01 | 3.091E-01 | 2.295E-01 | 1.577E-01 | NOT IDENT. |
| BI-212  | 1.246E-01  | 2.303E-01 | 2.136E-01 | 1.175E-01 | NOT IDENT. |
| PB-212  | -1.044E-02 | 2.901E-02 | 2.538E-02 | 1.480E-02 | NOT IDENT. |
| BI-214  | -1.656E-02 | 4.075E-02 | 3.117E-02 | 2.079E-02 | NOT IDENT. |
| PB-214  | 1.691E-02  | 3.558E-02 | 3.026E-02 | 1.815E-02 | NOT IDENT. |
| RN-219  | 6.419E-02  | 1.642E-01 | 1.488E-01 | 8.377E-02 | NOT IDENT. |
| RA-223  | -2.266E-01 | 2.755E-01 | 2.170E-01 | 1.406E-01 | NOT IDENT. |
| RA-224  | -3.579E-01 | 2.782E-01 | 2.206E-01 | 1.419E-01 | NOT IDENT. |
| RA-226  | -1.656E-02 | 4.075E-02 | 3.117E-02 | 2.079E-02 | NOT IDENT. |
| AC-227  | 9.977E-03  | 1.048E-01 | 9.432E-02 | 5.348E-02 | NOT IDENT. |
| TH-227  | 9.977E-03  | 1.048E-01 | 9.432E-02 | 5.348E-02 | NOT IDENT. |
| AC-228  | 2.259E-02  | 6.397E-02 | 5.947E-02 | 3.264E-02 | NOT IDENT. |
| RA-228  | 2.259E-02  | 6.397E-02 | 5.947E-02 | 3.264E-02 | NOT IDENT. |
| TH-228  | -1.044E-02 | 2.901E-02 | 2.538E-02 | 1.480E-02 | NOT IDENT. |
| TH-229  | 8.977E-03  | 1.881E-01 | 1.715E-01 | 9.598E-02 | NOT IDENT. |
| PA-231  | 2.674E-01  | 5.780E-01 | 5.350E-01 | 2.949E-01 | NOT IDENT. |
| TH-231  | -2.266E-01 | 2.755E-01 | 2.170E-01 | 1.406E-01 | NOT IDENT. |
| TH-232  | 2.259E-02  | 6.397E-02 | 5.947E-02 | 3.264E-02 | NOT IDENT. |
| PA-233  | -2.551E-03 | 2.790E-02 | 2.432E-02 | 1.423E-02 | NOT IDENT. |
| PA-234  | -5.034E-02 | 1.259E-01 | 9.872E-02 | 6.425E-02 | NOT IDENT. |
| PA-234M | 1.976E+00  | 2.387E+00 | 2.271E+00 | 1.218E+00 | NOT IDENT. |
| TH-234  | 5.384E-02  | 4.359E-01 | 4.241E-01 | 2.224E-01 | FAIL ABUN  |
| U-235   | 7.261E-02  | 8.753E-02 | 7.735E-02 | 4.466E-02 | FAIL ABUN  |
| NP-237  | 2.461E-02  | 7.687E-02 | 6.963E-02 | 3.922E-02 | NOT IDENT. |
| U-238   | 5.384E-02  | 4.359E-01 | 4.241E-01 | 2.224E-01 | FAIL ABUN  |
| NP-239  | -4.321E-02 | 1.412E-01 | 1.191E-01 | 7.202E-02 | NOT IDENT. |
| AM-241  | -8.496E-03 | 3.831E-02 | 3.386E-02 | 1.955E-02 | NOT IDENT. |
| CM-247  | 1.473E-03  | 1.528E-02 | 1.337E-02 | 7.797E-03 | NOT IDENT. |
| CF-249  | -2.340E-03 | 1.702E-02 | 1.449E-02 | 8.682E-03 | NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CF-251  | -1.401E-02 | 5.296E-02 | 4.373E-02 | 2.702E-02 | NOT IDENT. |
| ANH-511 | -2.557E-02 | 2.943E-02 | 2.861E-02 | 1.502E-02 | NOT IDENT. |

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*                                     *
*               GEL Laboratories LLC   *
*               2040 SAVAGE ROAD       *
*               CHARLESTON , SC 29417  *
*               GAMMA SPECTROSCOPY BACKGROUND REPORT *
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| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 65.1646    |
| 49.72  | 63.6473    |
| 57.36  | 66.6113    |
| 59.54  | 60.8961    |
| 63.29  | 62.3205    |
| 63.29  | 62.3205    |
| 64.28  | 65.4519    |
| 67.75  | 65.8506    |
| 69.67  | 71.1493    |
| 70.83  | 54.9937    |
| 72.81  | 70.5014    |
| 72.87  | 70.5084    |
| 72.87  | 70.5084    |
| 74.82  | 79.9594    |
| 74.82  | 79.9594    |
| 74.82  | 79.9594    |
| 74.97  | 79.9789    |
| 77.11  | 67.9071    |
| 77.11  | 67.9071    |
| 77.11  | 67.9071    |
| 79.69  | 78.5142    |
| 79.80  | 85.7605    |
| 80.12  | 79.6005    |
| 80.19  | 79.6091    |
| 80.57  | 75.5181    |
| 81.00  | 72.4627    |
| 81.07  | 72.4706    |
| 81.07  | 72.4706    |
| 83.79  | 73.8114    |
| 83.79  | 73.8114    |
| 85.43  | 77.1198    |
| 86.48  | 75.1523    |
| 86.55  | 75.1604    |
| 86.79  | 68.9212    |
| 86.94  | 78.9638    |
| 87.57  | 83.1142    |
| 88.03  | 75.3241    |
| 88.47  | 80.0832    |
| 89.96  | 78.6831    |
| 91.11  | 74.0844    |
| 92.59  | 73.7142    |
| 92.59  | 73.7142    |
| 93.35  | 73.7936    |
| 94.67  | 58.6165    |
| 94.87  | 58.6328    |
| 94.87  | 58.6328    |
| 95.86  | 63.4741    |
| 97.43  | 60.4312    |
| 98.44  | 60.5147    |
| 99.53  | 58.4781    |
| 100.11 | 57.4599    |
| 103.18 | 59.8330    |
| 103.37 | 57.7106    |
| 105.31 | 63.2151    |
| 106.12 | 54.7014    |
| 109.28 | 74.3096    |
| 111.00 | 72.3133    |
| 111.76 | 68.0613    |
| 116.30 | 55.4088    |
| 117.23 | 57.6471    |
| 121.12 | 53.5471    |
| 121.78 | 55.7766    |
| 122.06 | 65.6415    |
| 123.07 | 55.8622    |
| 131.20 | 55.2846    |
| 133.52 | 64.2983    |
| 136.00 | 62.2532    |

|        |         |
|--------|---------|
| 136.47 | 64.5101 |
| 140.51 | 81.5532 |
| 140.51 | 0.0000  |
| 143.76 | 44.8433 |
| 144.24 | 45.9882 |
| 144.24 | 45.9882 |
| 145.44 | 56.1549 |
| 152.43 | 55.4350 |
| 153.25 | 52.0846 |
| 154.21 | 63.4700 |
| 154.21 | 63.4700 |
| 156.02 | 64.7222 |
| 158.56 | 58.0577 |
| 159.00 | 52.3887 |
| 162.66 | 48.0075 |
| 163.33 | 50.3267 |
| 165.86 | 72.2368 |
| 176.60 | 49.8119 |
| 177.52 | 61.4484 |
| 181.07 | 54.6713 |
| 184.41 | 56.0049 |
| 185.72 | 49.0624 |
| 193.51 | 49.4037 |
| 197.04 | 51.3257 |
| 205.31 | 62.3849 |
| 210.85 | 61.7790 |
| 215.65 | 52.1355 |
| 222.11 | 54.2157 |
| 227.38 | 60.7944 |
| 228.16 | 63.5555 |
| 228.18 | 62.6486 |
| 235.69 | 82.1942 |
| 235.96 | 76.7300 |
| 235.96 | 76.7300 |
| 238.63 | 55.8346 |
| 238.63 | 55.8346 |
| 240.99 | 83.4435 |
| 242.00 | 78.9191 |
| 244.70 | 49.6548 |
| 252.40 | 46.2395 |
| 252.80 | 46.2532 |
| 256.23 | 47.2966 |
| 256.23 | 47.2966 |
| 260.90 | 48.3866 |
| 264.66 | 45.7177 |
| 268.22 | 42.0914 |
| 269.46 | 47.7448 |
| 269.46 | 47.7448 |
| 271.23 | 39.3680 |
| 273.65 | 44.1292 |
| 276.40 | 49.8573 |
| 277.37 | 39.5359 |
| 277.60 | 39.5423 |
| 278.00 | 43.3201 |
| 279.20 | 45.2402 |
| 279.54 | 45.2512 |
| 280.46 | 48.1094 |
| 283.69 | 35.9248 |
| 284.31 | 41.6146 |
| 285.41 | 46.3779 |
| 285.90 | 49.2340 |
| 287.50 | 50.2342 |
| 293.27 | 47.5739 |
| 295.22 | 50.4930 |
| 295.96 | 49.5641 |
| 298.57 | 45.8298 |
| 299.98 | 40.1383 |
| 299.98 | 40.1383 |
| 300.09 | 42.0523 |
| 300.09 | 42.0523 |
| 300.13 | 42.0536 |
| 301.36 | 37.3046 |
| 302.85 | 30.6382 |
| 304.50 | 38.3386 |
| 304.50 | 38.3386 |
| 304.85 | 39.3058 |
| 308.46 | 38.4363 |
| 311.90 | 42.3726 |

|        |          |
|--------|----------|
| 316.51 | 40.5645  |
| 319.41 | 34.8322  |
| 320.08 | 30.9751  |
| 323.87 | 47.5420  |
| 323.87 | 47.5420  |
| 328.76 | 29.1948  |
| 333.37 | 43.9151  |
| 334.37 | 33.2005  |
| 334.37 | 33.2005  |
| 338.28 | 40.1298  |
| 338.28 | 40.1298  |
| 338.32 | 40.1310  |
| 338.32 | 40.1310  |
| 338.32 | 40.1310  |
| 340.48 | 29.4022  |
| 340.55 | 29.4031  |
| 344.28 | 41.2560  |
| 351.06 | 32.5443  |
| 351.93 | 29.6008  |
| 356.01 | 43.5173  |
| 364.49 | 50.6864  |
| 366.42 | 41.7872  |
| 383.85 | 33.1526  |
| 388.16 | 33.2306  |
| 388.63 | 27.1957  |
| 391.69 | 27.2410  |
| 400.66 | 20.2756  |
| 401.81 | 25.3597  |
| 402.40 | 28.4119  |
| 404.85 | 34.5447  |
| 410.95 | 40.7709  |
| 414.70 | 16.3403  |
| 423.72 | 29.7545  |
| 427.09 | 31.8609  |
| 427.87 | 28.7891  |
| 433.94 | 25.7832  |
| 453.88 | 30.2045  |
| 463.37 | 34.5282  |
| 468.07 | 32.5080  |
| 473.00 | 29.4308  |
| 476.78 | 17.9004  |
| 477.60 | 22.1209  |
| 487.02 | 17.9860  |
| 492.35 | 18.0301  |
| 497.08 | 23.3834  |
| 511.00 | 38.5041  |
| 514.00 | 147.7958 |
| 527.90 | 21.5509  |
| 529.87 | 0.0000   |
| 531.02 | 20.5012  |
| 537.26 | 18.3925  |
| 546.56 | 0.0000   |
| 563.25 | 17.5020  |
| 569.33 | 25.2222  |
| 569.50 | 25.2236  |
| 569.70 | 19.7419  |
| 583.19 | 25.3654  |
| 600.60 | 39.9792  |
| 602.73 | 45.5707  |
| 604.72 | 42.2699  |
| 609.32 | 34.5448  |
| 609.32 | 34.5448  |
| 610.33 | 30.0998  |
| 614.28 | 27.9129  |
| 618.01 | 30.1896  |
| 621.93 | 25.7564  |
| 621.93 | 25.7564  |
| 633.25 | 14.6210  |
| 635.95 | 25.2191  |
| 636.99 | 17.1199  |
| 645.85 | 18.9851  |
| 657.76 | 19.0697  |
| 661.66 | 23.6444  |
| 661.66 | 23.6444  |
| 664.57 | 21.8487  |
| 666.33 | 26.4179  |
| 666.50 | 26.4193  |
| 677.62 | 24.6968  |

|         |         |
|---------|---------|
| 685.70  | 15.5955 |
| 695.00  | 23.0109 |
| 696.49  | 25.7858 |
| 696.51  | 25.7858 |
| 697.00  | 32.2374 |
| 702.65  | 22.1502 |
| 706.68  | 25.8781 |
| 711.68  | 22.2205 |
| 720.70  | 17.6464 |
| 721.93  | 11.1498 |
| 722.78  | 15.8001 |
| 722.91  | 15.8010 |
| 723.31  | 16.7326 |
| 724.19  | 20.4569 |
| 727.33  | 13.0324 |
| 733.00  | 25.1826 |
| 735.93  | 16.8051 |
| 739.50  | 18.6948 |
| 747.24  | 18.7441 |
| 752.31  | 19.7147 |
| 753.82  | 15.0281 |
| 756.73  | 15.0430 |
| 763.94  | 16.9638 |
| 765.81  | 21.6894 |
| 766.42  | 18.8643 |
| 777.92  | 12.3081 |
| 778.90  | 16.1002 |
| 783.70  | 20.8683 |
| 785.37  | 18.0324 |
| 795.86  | 15.2367 |
| 801.95  | 12.4040 |
| 810.29  | 10.5233 |
| 810.76  | 9.5681  |
| 815.77  | 21.0832 |
| 818.51  | 14.3873 |
| 832.01  | 18.3010 |
| 834.85  | 18.3172 |
| 836.80  | 0.0000  |
| 846.77  | 14.5140 |
| 856.80  | 12.6172 |
| 860.56  | 12.6315 |
| 871.09  | 22.4194 |
| 873.19  | 13.6551 |
| 875.33  | 0.0000  |
| 879.36  | 18.5663 |
| 880.51  | 12.7074 |
| 883.24  | 19.5659 |
| 884.68  | 24.4678 |
| 889.28  | 12.7404 |
| 898.04  | 8.8431  |
| 911.20  | 8.8770  |
| 911.20  | 8.8770  |
| 911.20  | 8.8770  |
| 926.50  | 12.8788 |
| 937.49  | 13.9128 |
| 944.13  | 10.9522 |
| 946.00  | 15.9387 |
| 949.00  | 11.9643 |
| 962.29  | 15.0110 |
| 964.08  | 11.0134 |
| 966.15  | 24.0428 |
| 968.97  | 19.0487 |
| 968.97  | 19.0487 |
| 968.97  | 19.0487 |
| 983.53  | 10.0659 |
| 996.26  | 21.2117 |
| 1001.03 | 11.1251 |
| 1004.73 | 14.1733 |
| 1037.84 | 11.9156 |
| 1038.76 | 0.0000  |
| 1048.07 | 18.4333 |
| 1050.41 | 16.3945 |
| 1050.41 | 16.3945 |
| 1063.66 | 12.3381 |
| 1085.87 | 10.3403 |
| 1099.45 | 14.5257 |
| 1112.07 | 15.6123 |
| 1115.54 | 15.6262 |

|         |         |
|---------|---------|
| 1120.29 | 11.4727 |
| 1120.29 | 11.4727 |
| 1120.55 | 9.3872  |
| 1121.30 | 10.4321 |
| 1131.51 | 0.0000  |
| 1173.23 | 6.3387  |
| 1177.93 | 11.6338 |
| 1189.05 | 7.4228  |
| 1204.77 | 8.5145  |
| 1221.41 | 10.6846 |
| 1231.02 | 7.4956  |
| 1235.36 | 8.5750  |
| 1238.28 | 10.7256 |
| 1260.41 | 0.0000  |
| 1271.85 | 10.8076 |
| 1274.44 | 14.0582 |
| 1274.54 | 15.1396 |
| 1291.59 | 8.6840  |
| 1298.22 | 0.0000  |
| 1312.11 | 9.8134  |
| 1332.49 | 13.1426 |
| 1365.19 | 11.0293 |
| 1368.63 | 0.0000  |
| 1384.29 | 10.1505 |
| 1408.01 | 10.2010 |
| 1457.56 | 0.0000  |
| 1460.82 | 5.6243  |
| 1489.16 | 8.4840  |
| 1505.03 | 9.4560  |
| 1596.21 | 6.7357  |
| 1620.50 | 6.7662  |
| 1678.03 | 0.0000  |
| 1690.97 | 6.8533  |
| 1764.49 | 7.9339  |
| 1764.49 | 7.9339  |
| 1770.23 | 6.9490  |
| 1771.35 | 8.9363  |
| 1791.20 | 0.0000  |
| 1836.06 | 4.0155  |



TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G1202054948

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 1.9376E-01 | ug/g |
| Total Uranium Counting Unc. | 1.2974E+00 | ug/g |
| Total Uranium Tpu           | 6.6192E-07 | ug/g |
| Total Uranium Mda           | 1.2623E+00 | ug/g |

```

*****
*
*               GEL Laboratories LLC               *
*               2040 SAVAGE ROAD                   *
*               CHARLESTON ,SC 29417               *
*               GROSS GAMMA REPORT                 *
*
*****
*
*  BATCH ID      : 958216                      SAMPLE ID   : G1202054948
*  ANALYST       : MXR1                        DETECTOR    : GAM20
*  SAMPLE DATE   : 2-MAR-2010 00:00:00.00      COUNT TIME   : 0 02:00:00.00
*  ANALYSIS DATE : 11-MAR-2010 19:26:53.99     SAMPLE ALQT  : 142.620 GRAM
*
*****

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GROSS GAMMA ACTIVITY (pCi/GRAM ) : 7.089E-02
GROSS GAMMA ERROR   (pCi/GRAM ) : 3.114E-02
GROSS GAMMA MDA     (pCi/GRAM ) : 1.321E-01
GROSS GAMMA DLC     (pCi/GRAM ) : 6.165E-02

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VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 21:56:34.44

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                    *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054949.CNF;1
Sample date        : 23-FEB-2010 12:00:00 Acquisition date : 11-MAR-2010 19:27:29
Sample ID          : G1202054949 Sample quantity   : 1.26980E+02 GRAM
Detector name      : GAM23 Detector geometry: CAN
Elapsed live time  : 0 02:00:00.00 Elapsed real time: 0 02:00:01.81 0.0%
Energy tolerance   : 1.80000 keV Analyst Initials : MXR1
Abundance limit    : 75.00000 Sensitivity          : 5.00000
Batch ID           : 958216 Detector SN#           :
Matrix Spike ID    : LCS ID                          : 1032-A
*****

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| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|------|----|----------|------|----------|
| 1  | 1  | 74.62    | 454  | 464   | 1.38 | 149.24  | 145  | 13 | 6.30E-02 | 9.4  | 4.54E+00 |
| 2  | 1  | 77.00    | 657  | 380   | 1.14 | 154.01  | 145  | 13 | 9.13E-02 | 6.4  |          |
| 3  | 2  | 87.05    | 252  | 433   | 1.53 | 174.11  | 164  | 29 | 3.50E-02 | 16.1 | 1.73E+00 |
| 4  | 2  | 89.73    | 186  | 368   | 1.40 | 179.47  | 164  | 29 | 2.58E-02 | 20.0 |          |
| 5  | 2  | 92.68*   | 263  | 385   | 1.56 | 185.35  | 164  | 29 | 3.65E-02 | 16.1 |          |
| 6  | 0  | 128.63   | 140  | 436   | 1.25 | 257.26  | 252  | 11 | 1.94E-02 | 30.1 |          |
| 7  | 0  | 185.88*  | 133  | 397   | 1.03 | 371.77  | 366  | 11 | 1.85E-02 | 31.2 |          |
| 8  | 0  | 208.83   | 94   | 346   | 1.07 | 417.66  | 414  | 10 | 1.30E-02 | 38.7 |          |
| 9  | 4  | 238.26*  | 1259 | 183   | 1.16 | 476.52  | 469  | 19 | 1.75E-01 | 3.4  | 1.23E+00 |
| 10 | 4  | 241.25   | 313  | 282   | 1.80 | 482.49  | 469  | 19 | 4.34E-02 | 14.4 |          |
| 11 | 0  | 269.40   | 75   | 279   | 1.07 | 538.80  | 533  | 12 | 1.04E-02 | 46.1 |          |
| 12 | 0  | 294.74   | 311  | 248   | 1.24 | 589.49  | 584  | 11 | 4.32E-02 | 11.3 |          |
| 13 | 0  | 299.99   | 93   | 228   | 0.93 | 599.98  | 595  | 11 | 1.29E-02 | 33.4 |          |
| 14 | 0  | 337.91   | 272  | 186   | 1.26 | 675.81  | 671  | 12 | 3.78E-02 | 11.7 |          |
| 15 | 0  | 351.39*  | 565  | 199   | 1.28 | 702.78  | 698  | 11 | 7.85E-02 | 6.5  |          |
| 16 | 0  | 510.16*  | 175  | 85    | 2.12 | 1020.32 | 1014 | 14 | 2.42E-02 | 15.8 |          |
| 17 | 0  | 582.38*  | 394  | 118   | 1.51 | 1164.76 | 1157 | 17 | 5.47E-02 | 8.2  |          |
| 18 | 0  | 608.58*  | 421  | 149   | 1.64 | 1217.15 | 1208 | 17 | 5.85E-02 | 8.3  |          |
| 19 | 0  | 726.01   | 99   | 91    | 1.72 | 1452.03 | 1444 | 17 | 1.38E-02 | 24.0 |          |
| 20 | 0  | 768.68   | 96   | 118   | 4.85 | 1537.36 | 1527 | 25 | 1.33E-02 | 32.2 |          |
| 21 | 0  | 793.86   | 38   | 59    | 1.82 | 1587.72 | 1583 | 10 | 5.32E-03 | 41.1 |          |
| 22 | 0  | 859.96   | 63   | 57    | 1.21 | 1719.93 | 1713 | 14 | 8.81E-03 | 28.6 |          |
| 23 | 0  | 910.19*  | 295  | 50    | 1.81 | 1820.38 | 1813 | 17 | 4.10E-02 | 8.2  |          |
| 24 | 1  | 963.81   | 58   | 35    | 2.12 | 1927.61 | 1921 | 23 | 8.08E-03 | 25.1 | 1.60E+00 |
| 25 | 1  | 967.82   | 183  | 27    | 2.13 | 1935.64 | 1921 | 23 | 2.54E-02 | 9.9  |          |
| 26 | 0  | 1119.83  | 95   | 84    | 1.92 | 2239.66 | 2234 | 18 | 1.32E-02 | 26.0 |          |
| 27 | 0  | 1459.10  | 1275 | 22    | 2.51 | 2918.20 | 2910 | 22 | 1.77E-01 | 3.0  |          |
| 28 | 0  | 1508.66  | 17   | 11    | 2.80 | 3017.33 | 3009 | 12 | 2.30E-03 | 48.3 |          |
| 29 | 0  | 1763.25* | 37   | 21    | 1.88 | 3526.51 | 3518 | 14 | 5.18E-03 | 31.9 |          |

Flag: "\*" = Peak area was modified by background subtraction

## VMS Nuclide Identification Report V3.1 Generated 11-MAR-2010 21:56:37

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054949.CNF;1  
 Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8  
 Sample title : MXR1  
 Sample date : 23-FEB-2010 12:00:00 Acquisition date : 11-MAR-2010 19:27:29  
 Sample ID : G1202054949 Sample quantity : 126.98 GRAM  
 Sample type : SOLID Sample geometry :  
 Detector name : GAMMA23 Detector geometry: CAN  
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:01.81 0.0%  
 Peak Width (FWHM): 3.00 Confidence level : 5.00 %  
 Energy tolerance : 1.80 keV Half life ratio : 8.00  
 Errors propagated: Yes Systematic Error : 0.00 %  
 Efficiency type : Empirical Efficiencies at : Peak Energy  
 Abundance limit : 75.00 WTM error limit : 3.00

## Full Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| K-40    | +         | 1460.82      | *   | 3.544E+01           | 3.379E+00 | 6.287E-01      | 4.703E-02 | 56.373  |
| CD-109  | +         | 88.03        | *   | 3.953E+00           | 1.330E+00 | 1.395E+00      | 1.362E-01 | 2.834   |
| SN-126  |           | 64.28        |     | 8.107E-01           | 6.936E-01 | 1.183E+00      | 1.800E-01 | 0.685   |
|         | +         | 86.94        |     | 1.604E+00           | 8.436E-01 | 5.741E-01      | 2.388E-01 | 2.793   |
|         | +         | 87.57        | *   | 3.857E-01           | 1.297E-01 | 1.369E-01      | 1.332E-02 | 2.817   |
| CS-135  | +         | 268.22       | *   | 3.265E-01           | 3.023E-01 | 2.851E-01      | 2.178E-02 | 1.145   |
| TL-208  |           | 277.37       |     | 3.481E-01           | 4.668E-01 | 7.707E-01      | 8.316E-02 | 0.452   |
|         | +         | 583.19       | *   | 6.016E-01           | 1.059E-01 | 6.505E-02      | 4.213E-03 | 9.248   |
|         | +         | 860.56       |     | 9.321E-01           | 5.389E-01 | 4.909E-01      | 4.437E-02 | 1.899   |
| BI-211  | +         | 72.87        |     | 2.703E+01           | 5.634E+00 | 6.489E+00      | 5.724E-01 | 4.165   |
|         | +         | 351.06       | *   | 3.755E+00           | 5.450E-01 | 3.993E-01      | 2.602E-02 | 9.403   |
| PB-212  | +         | 74.82        |     | 3.234E+00           | 7.438E-01 | 7.156E-01      | 9.432E-02 | 4.518   |
|         | +         | 77.11        |     | 2.644E+00           | 4.117E-01 | 3.925E-01      | 3.531E-02 | 6.736   |
|         | +         | 238.63       | *   | 1.841E+00           | 1.829E-01 | 1.048E-01      | 7.600E-03 | 17.569  |
|         | +         | 300.09       |     | 2.128E+00           | 1.433E+00 | 1.395E+00      | 1.178E-01 | 1.525   |
| BI-214  | +         | 609.32       | *   | 1.247E+00           | 2.277E-01 | 1.373E-01      | 1.041E-02 | 9.078   |
|         | +         | 1120.29      |     | 1.492E+00           | 7.867E-01 | 5.820E-01      | 5.442E-02 | 2.563   |
|         | +         | 1764.49      |     | 8.241E-01           | 5.288E-01 | 3.786E-01      | 2.354E-02 | 2.177   |
| PB-214  | +         | 74.82        |     | 5.731E+00           | 1.278E+00 | 1.268E+00      | 1.511E-01 | 4.518   |
|         | +         | 77.11        |     | 4.661E+00           | 8.213E-01 | 6.919E-01      | 8.445E-02 | 6.736   |
|         | +         | 242.00       |     | 2.772E+00           | 8.289E-01 | 6.058E-01      | 4.898E-02 | 4.576   |
|         | +         | 295.22       |     | 1.265E+00           | 3.068E-01 | 2.736E-01      | 2.398E-02 | 4.623   |
|         | +         | 351.93       | *   | 1.363E+00           | 2.116E-01 | 1.425E-01      | 1.217E-02 | 9.563   |
| RA-224  | +         | 240.99       | *   | 4.902E+00           | 1.438E+00 | 1.123E+00      | 6.327E-02 | 4.365   |
| RA-226  | +         | 609.32       | *   | 1.247E+00           | 2.277E-01 | 1.373E-01      | 1.041E-02 | 9.078   |
|         | +         | 1120.29      |     | 1.492E+00           | 7.867E-01 | 5.820E-01      | 5.442E-02 | 2.563   |
|         | +         | 1764.49      |     | 8.241E-01           | 5.288E-01 | 3.786E-01      | 2.354E-02 | 2.177   |
| AC-228  | +         | 338.32       |     | 2.011E+00           | 9.528E-01 | 4.477E-01      | 1.846E-01 | 4.493   |
|         | +         | 911.20       | *   | 2.217E+00           | 4.503E-01 | 2.770E-01      | 3.290E-02 | 8.003   |
|         | +         | 968.97       |     | 2.376E+00           | 7.462E-01 | 3.966E-01      | 9.640E-02 | 5.992   |
| RA-228  | +         | 338.32       |     | 2.011E+00           | 9.528E-01 | 4.477E-01      | 1.846E-01 | 4.493   |
|         | +         | 911.20       | *   | 2.217E+00           | 4.503E-01 | 2.770E-01      | 3.290E-02 | 8.003   |
|         | +         | 968.97       |     | 2.376E+00           | 7.462E-01 | 3.966E-01      | 9.640E-02 | 5.992   |
| TH-228  | +         | 74.82        |     | 3.234E+00           | 6.751E-01 | 7.156E-01      | 6.419E-02 | 4.518   |

---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TH-229  | +         | 77.11        |     | 2.644E+00           | 4.117E-01 | 3.925E-01      | 3.531E-02 | 6.736   |
|         | +         | 238.63       | *   | 1.841E+00           | 1.829E-01 | 1.048E-01      | 7.600E-03 | 17.569  |
|         | +         | 300.09       |     | 2.128E+00           | 1.924E+00 | 1.395E+00      | 8.495E-01 | 1.525   |
|         | +         | 85.43        |     | 9.709E-01           | 3.266E-01 | 3.553E-01      | 3.392E-02 | 2.733   |
|         | +         | 88.47        |     | 4.235E-01           | 1.740E-01 | 2.086E-01      | 2.017E-02 | 2.030   |
| TH-232  |           | 193.51       | *   | 5.579E-01           | 6.117E-01 | 1.028E+00      | 5.442E-02 | 0.543   |
|         |           | 210.85       |     | 1.592E+00           | 1.207E+00 | 1.825E+00      | 9.907E-02 | 0.872   |
|         | +         | 338.32       |     | 2.011E+00           | 4.837E-01 | 4.477E-01      | 2.644E-02 | 4.493   |
|         | +         | 911.20       | *   | 2.217E+00           | 4.503E-01 | 2.770E-01      | 3.290E-02 | 8.003   |
| U-235   | +         | 968.97       |     | 2.376E+00           | 7.462E-01 | 3.966E-01      | 9.640E-02 | 5.992   |
|         | +         | 89.96        |     | 2.929E+00           | 1.380E+00 | 1.417E+00      | 3.527E-01 | 2.067   |
|         | +         | 93.35        |     | 2.484E+00           | 9.854E-01 | 8.477E-01      | 1.963E-01 | 2.930   |
|         |           | 143.76       | *   | 1.400E-01           | 2.384E-01 | 3.938E-01      | 6.132E-02 | 0.356   |
| NP-237  |           | 163.33       |     | -3.698E-01          | 5.213E-01 | 8.190E-01      | 1.356E-01 | -0.452  |
|         | +         | 185.72       |     | 1.254E-01           | 7.843E-02 | 7.353E-02      | 3.850E-03 | 1.705   |
|         |           | 205.31       |     | -8.194E-02          | 6.609E-01 | 9.253E-01      | 1.559E-01 | -0.089  |
|         | +         | 86.48        | *   | 1.151E+00           | 4.562E-01 | 4.147E-01      | 9.570E-02 | 2.775   |
|         |           | 95.86        |     | -3.967E-01          | 1.209E+00 | 1.726E+00      | 4.126E-01 | -0.230  |
| ANH-511 | +         | 511.00       | *   | 2.026E-01           | 6.503E-02 | 5.286E-02      | 3.070E-03 | 3.833   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| BE-7    |           | 477.60       | *   | 8.886E-02           | 3.783E-01 | 6.329E-01           | 4.299E-02 | 0.140   |
| NA-22   |           | 1274.54      | *   | -3.138E-02          | 5.893E-02 | 9.102E-02           | 6.113E-03 | -0.345  |
| NA-24   |           | 1368.63      | *   | -1.217E+00          | 5.893E-02 | Half-Life too short |           |         |
| SC-46   |           | 889.28       | *   | 1.969E-02           | 4.714E-02 | 8.130E-02           | 7.264E-03 | 0.242   |
| V-48    | +         | 1120.55      |     | 2.548E-01           | 1.333E-01 | 1.487E-01           | 9.688E-03 | 1.714   |
|         |           | 944.13       |     | 2.686E-01           | 1.178E+00 | 1.994E+00           | 1.737E-01 | 0.135   |
|         |           | 983.53       | *   | 8.106E-03           | 9.219E-02 | 1.539E-01           | 1.280E-02 | 0.053   |
|         |           | 1312.11      |     | 9.886E-02           | 1.055E-01 | 1.883E-01           | 1.340E-02 | 0.525   |
| CR-51   |           | 320.08       | *   | -2.642E-01          | 4.366E-01 | 7.086E-01           | 4.640E-02 | -0.373  |
| MN-54   |           | 834.85       | *   | 8.766E-03           | 4.920E-02 | 8.328E-02           | 6.595E-03 | 0.105   |
| CO-56   |           | 846.77       | *   | 1.200E-02           | 4.931E-02 | 8.396E-02           | 6.831E-03 | 0.143   |
| CO-57   |           | 1037.84      |     | -7.897E-02          | 4.017E-01 | 6.554E-01           | 5.366E-02 | -0.121  |
|         |           | 1238.28      |     | 8.267E-02           | 1.268E-01 | 2.164E-01           | 1.440E-02 | 0.382   |
|         |           | 1771.35      |     | 1.190E-01           | 2.668E-01 | 4.768E-01           | 2.950E-02 | 0.250   |
|         |           | 122.06       | *   | 6.173E-03           | 3.132E-02 | 5.016E-02           | 2.957E-03 | 0.123   |
|         |           | 136.47       |     | -3.618E-02          | 2.494E-01 | 4.065E-01           | 2.638E-02 | -0.089  |
| CO-58   |           | 810.76       | *   | -2.450E-02          | 4.890E-02 | 7.857E-02           | 5.903E-03 | -0.312  |
| FE-59   |           | 1099.45      | *   | 8.418E-02           | 1.155E-01 | 2.020E-01           | 1.555E-02 | 0.417   |
| CO-60   |           | 1291.59      |     | -1.086E-01          | 1.589E-01 | 2.391E-01           | 1.985E-02 | -0.454  |
|         |           | 1173.23      |     | 1.598E-02           | 5.568E-02 | 9.353E-02           | 5.276E-03 | 0.171   |
|         |           | 1332.49      | *   | 8.448E-03           | 4.611E-02 | 7.662E-02           | 5.625E-03 | 0.110   |
| ZN-65   |           | 1115.54      | *   | 1.406E-01           | 1.486E-01 | 2.304E-01           | 1.522E-02 | 0.610   |
| SE-75   |           | 121.12       |     | 8.512E-02           | 1.588E-01 | 2.661E-01           | 2.439E-02 | 0.320   |
|         |           | 136.00       |     | -1.181E-02          | 4.874E-02 | 7.916E-02           | 4.472E-03 | -0.149  |
|         |           | 264.66       | *   | -2.407E-02          | 6.318E-02 | 8.552E-02           | 4.980E-03 | -0.281  |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
|         |           | 279.54       |     | 2.751E-02           | 1.260E-01 | 2.146E-01           | 1.351E-02 | 0.128   |
|         |           | 400.66       |     | 1.090E-01           | 3.146E-01 | 5.322E-01           | 4.825E-02 | 0.205   |
| SR-85   |           | 514.00       | *   | 5.684E-03           | 4.758E-02 | 6.840E-02           | 3.969E-03 | 0.083   |
| Y-88    |           | 898.04       |     | -1.094E-04          | 5.452E-02 | 9.078E-02           | 8.300E-03 | -0.001  |
|         |           | 1836.06      | *   | 4.789E-03           | 4.128E-02 | 6.965E-02           | 4.101E-03 | 0.069   |
| Y-91    |           | 1204.77      | *   | 9.403E+00           | 2.916E+01 | 4.893E+01           | 2.918E+00 | 0.192   |
| NB-94   |           | 702.65       | *   | 1.695E-02           | 4.345E-02 | 7.212E-02           | 4.121E-03 | 0.235   |
|         |           | 871.09       |     | 8.472E-03           | 3.981E-02 | 6.763E-02           | 5.808E-03 | 0.125   |
| NB-95   |           | 765.81       | *   | 9.354E-02           | 6.203E-02 | 9.928E-02           | 6.672E-03 | 0.942   |
| NB-95M  |           | 235.69       | *   | 9.260E-01           | 2.024E-01 | 3.317E-01           | 2.456E-02 | 2.791   |
| ZR-95   |           | 724.19       |     | 3.043E-01           | 1.420E-01 | 2.363E-01           | 1.665E-02 | 1.287   |
|         |           | 756.73       | *   | 7.818E-02           | 9.204E-02 | 1.579E-01           | 1.218E-02 | 0.495   |
| MO-99   |           | 140.51       |     | -2.759E+01          | 3.707E+01 | 5.816E+01           | 1.325E+01 | -0.474  |
|         |           | 181.07       |     | -2.050E+01          | 3.214E+01 | 4.361E+01           | 7.626E+00 | -0.470  |
|         |           | 366.42       |     | -1.034E+02          | 1.543E+02 | 2.472E+02           | 1.449E+01 | -0.418  |
|         |           | 739.50       | *   | -1.310E+00          | 2.123E+01 | 3.397E+01           | 4.965E+00 | -0.039  |
|         |           | 777.92       |     | 2.335E+01           | 6.227E+01 | 9.427E+01           | 6.527E+00 | 0.248   |
| TC-99M  |           | 140.51       | *   | -9.516E+11          | 6.227E+01 | Half-Life too short |           |         |
| RU-103  |           | 497.08       | *   | 2.332E-02           | 4.749E-02 | 8.056E-02           | 1.002E-02 | 0.289   |
|         | +         | 610.33       |     | 1.314E+01           | 2.935E+00 | 3.130E+00           | 4.669E-01 | 4.198   |
| RH-106  |           | 621.93       | *   | 1.100E-01           | 3.823E-01 | 6.344E-01           | 7.241E-02 | 0.173   |
|         |           | 1050.41      |     | -1.073E-01          | 3.081E+00 | 5.067E+00           | 3.812E-01 | -0.021  |
| RU-106  |           | 621.93       | *   | 1.100E-01           | 3.821E-01 | 6.344E-01           | 3.409E-02 | 0.173   |
|         |           | 1050.41      |     | -1.073E-01          | 3.081E+00 | 5.067E+00           | 3.812E-01 | -0.021  |
| AG-108M |           | 433.94       | *   | -1.880E-02          | 3.291E-02 | 5.230E-02           | 3.269E-03 | -0.359  |
|         |           | 614.28       |     | -3.189E-02          | 4.726E-02 | 6.119E-02           | 3.584E-03 | -0.521  |
|         |           | 722.91       |     | -4.769E-02          | 6.034E-02 | 7.647E-02           | 4.908E-03 | -0.624  |
| AG-110M |           | 657.76       | *   | -1.489E-02          | 4.306E-02 | 6.778E-02           | 3.767E-03 | -0.220  |
|         |           | 677.62       |     | -4.701E-02          | 3.765E-01 | 6.022E-01           | 3.451E-02 | -0.078  |
|         |           | 706.68       |     | -5.539E-02          | 2.725E-01 | 4.324E-01           | 2.655E-02 | -0.128  |
|         |           | 763.94       |     | -9.314E-02          | 2.394E-01 | 3.155E-01           | 2.205E-02 | -0.295  |
|         |           | 884.68       |     | -3.285E-02          | 6.231E-02 | 9.911E-02           | 9.036E-03 | -0.331  |
|         |           | 937.49       |     | -5.500E-02          | 1.285E-01 | 2.049E-01           | 1.860E-02 | -0.268  |
|         |           | 1384.29      |     | 1.432E-02           | 1.708E-01 | 2.803E-01           | 2.122E-02 | 0.051   |
|         |           | 1505.03      |     | 2.620E-01           | 3.425E-01 | 5.545E-01           | 3.938E-02 | 0.472   |
| SN-113  |           | 391.69       | *   | -1.385E-03          | 5.410E-02 | 8.979E-02           | 5.531E-03 | -0.015  |
| CD-115  |           | 260.90       |     | 8.473E+01           | 2.367E+02 | 3.857E+02           | 2.215E+01 | 0.220   |
|         |           | 492.35       |     | -3.096E+01          | 6.908E+01 | 1.101E+02           | 6.430E+00 | -0.281  |
|         |           | 527.90       | *   | -1.889E+00          | 1.988E+01 | 3.236E+01           | 1.867E+00 | -0.058  |
| SN-117M |           | 156.02       |     | -3.100E+00          | 2.920E+00 | 4.560E+00           | 2.386E-01 | -0.680  |
|         |           | 158.56       | *   | 6.137E-02           | 6.936E-02 | 1.168E-01           | 6.072E-03 | 0.525   |
| TE-123M |           | 159.00       | *   | 3.718E-02           | 3.391E-02 | 5.755E-02           | 3.037E-03 | 0.646   |
| SB-124  |           | 602.73       |     | 2.053E-02           | 5.266E-02 | 7.708E-02           | 4.226E-03 | 0.266   |
|         |           | 645.85       |     | -1.478E-01          | 5.740E-01 | 9.097E-01           | 5.461E-02 | -0.162  |
|         |           | 722.78       |     | -5.406E-01          | 6.115E-01 | 7.653E-01           | 4.826E-02 | -0.706  |
|         |           | 1690.97      | *   | 4.776E-02           | 8.280E-02 | 1.521E-01           | 1.064E-02 | 0.314   |
| SB-125  |           | 427.87       | *   | -6.821E-02          | 1.008E-01 | 1.591E-01           | 9.664E-03 | -0.429  |
|         |           | 463.37       |     | 5.077E-01           | 3.531E-01 | 6.260E-01           | 4.243E-02 | 0.811   |
|         |           | 600.60       |     | 1.620E-01           | 2.373E-01 | 3.576E-01           | 2.305E-02 | 0.453   |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Activity Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|--------------|---------------------|-----------|----------------|-----------|---------|
| TE-125M |           | 635.95       |              | -1.101E-01          | 3.237E-01 | 5.102E-01      | 3.247E-02 | -0.216  |
|         |           | 109.28       | *            | -1.009E+01          | 1.196E+01 | 1.907E+01      | 1.735E+00 | -0.529  |
|         | I-126     | 388.63       |              | 4.865E-02           | 2.082E-01 | 3.507E-01      | 2.028E-02 | 0.139   |
| SB-126  |           | 666.33       | *            | -2.546E-02          | 2.960E-01 | 4.758E-01      | 2.462E-02 | -0.054  |
|         |           | 753.82       |              | 1.990E+00           | 2.445E+00 | 4.183E+00      | 2.729E-01 | 0.476   |
|         |           | 414.70       |              | -3.937E-02          | 8.750E-02 | 1.407E-01      | 8.189E-03 | -0.280  |
|         |           | 666.50       |              | 5.715E-03           | 1.006E-01 | 1.635E-01      | 8.468E-03 | 0.035   |
|         |           | 695.00       |              | -9.297E-03          | 1.152E-01 | 1.849E-01      | 1.035E-02 | -0.050  |
| SB-127  |           | 697.00       |              | -1.542E-02          | 3.980E-01 | 6.407E-01      | 3.606E-02 | -0.024  |
|         |           | 720.70       | *            | 2.873E-02           | 2.180E-01 | 3.073E-01      | 1.842E-02 | 0.093   |
|         |           | 856.80       |              | 7.058E-01           | 7.219E-01 | 1.148E+00      | 9.551E-02 | 0.615   |
|         |           | 252.40       |              | -1.677E+00          | 6.347E+00 | 9.964E+00      | 4.097E+00 | -0.168  |
|         |           | 473.00       |              | -1.279E-01          | 2.400E+00 | 3.940E+00      | 4.514E-01 | -0.032  |
| I-131   |           | 685.70       | *            | -8.091E-01          | 1.970E+00 | 3.068E+00      | 2.958E-01 | -0.264  |
|         |           | 783.70       |              | 3.749E+00           | 5.123E+00 | 9.034E+00      | 1.053E+00 | 0.415   |
|         |           | 80.19        |              | -3.120E+00          | 9.278E+00 | 9.559E+00      | 8.825E-01 | -0.326  |
|         |           | 284.31       |              | -2.447E-01          | 1.907E+00 | 3.194E+00      | 2.071E-01 | -0.077  |
| TE-132  |           | 364.49       | *            | 1.399E-01           | 1.445E-01 | 2.537E-01      | 1.660E-02 | 0.552   |
|         |           | 636.99       |              | 6.650E-03           | 2.075E+00 | 3.366E+00      | 2.042E-01 | 0.002   |
|         |           | 49.72        |              | -7.141E+00          | 3.912E+01 | 6.539E+01      | 7.308E+00 | -0.109  |
|         |           | 111.76       |              | -4.173E+01          | 5.129E+01 | 8.177E+01      | 8.126E+00 | -0.510  |
| BA-133  |           | 116.30       |              | 2.478E+01           | 4.497E+01 | 7.543E+01      | 7.316E+00 | 0.328   |
|         |           | 228.16       | *            | -8.840E-01          | 1.150E+00 | 1.771E+00      | 2.593E-01 | -0.499  |
|         |           | 81.00        |              | 8.825E-02           | 1.610E-01 | 1.781E-01      | 2.824E-02 | 0.496   |
|         |           | 276.40       |              | 2.612E-01           | 4.468E-01 | 7.082E-01      | 8.918E-02 | 0.369   |
| I-133   |           | 302.85       |              | 3.271E-02           | 1.825E-01 | 2.705E-01      | 3.097E-02 | 0.121   |
|         |           | 356.01       | *            | 2.934E-02           | 5.525E-02 | 8.337E-02      | 9.437E-03 | 0.352   |
|         |           | 383.85       |              | -8.872E-02          | 3.377E-01 | 5.530E-01      | 5.898E-02 | -0.160  |
|         |           | 529.87       | *            | 5.876E-04           | 3.377E-01 | Half-Life      | too short |         |
| CS-134  |           | 875.33       |              | 9.863E-02           | 3.377E-01 | Half-Life      | too short |         |
|         |           | 1298.22      |              | 3.539E-02           | 3.377E-01 | Half-Life      | too short |         |
|         |           | 563.25       |              | 1.769E-01           | 4.498E-01 | 7.486E-01      | 4.330E-02 | 0.236   |
|         |           | 569.33       |              | -8.770E-02          | 2.319E-01 | 3.675E-01      | 2.136E-02 | -0.239  |
| I-135   |           | 604.72       |              | 2.433E-02           | 4.736E-02 | 6.993E-02      | 3.849E-03 | 0.348   |
|         |           | 795.86       | *            | 9.409E-02           | 5.968E-02 | 1.008E-01      | 7.365E-03 | 0.933   |
|         |           | 801.95       |              | -4.495E-01          | 4.699E-01 | 7.021E-01      | 5.190E-02 | -0.640  |
|         |           | 1365.19      |              | -3.402E-01          | 1.397E+00 | 2.186E+00      | 1.701E-01 | -0.156  |
|         |           | 546.56       |              | 2.585E+10           | 1.397E+00 | Half-Life      | too short |         |
| CS-136  |           | 836.80       |              | 8.413E+11           | 1.397E+00 | Half-Life      | too short |         |
|         |           | 1038.76      |              | 1.170E+11           | 1.397E+00 | Half-Life      | too short |         |
|         |           | 1131.51      |              | -9.002E+10          | 1.397E+00 | Half-Life      | too short |         |
|         |           | 1260.41      | *            | -2.565E+10          | 1.397E+00 | Half-Life      | too short |         |
|         |           | + 1457.56    |              | 3.905E+13           | 1.397E+00 | Half-Life      | too short |         |
|         |           | 1678.03      |              | 2.110E+11           | 1.397E+00 | Half-Life      | too short |         |
|         |           | 1791.20      |              | 3.865E+10           | 1.397E+00 | Half-Life      | too short |         |
|         | 153.25    |              | 3.520E-01    | 1.073E+00           | 1.773E+00 | 1.361E-01      | 0.199     |         |
|         | 176.60    |              | 1.636E-01    | 6.329E-01           | 1.039E+00 | 6.800E-02      | 0.158     |         |
|         | 273.65    |              | -9.807E-01   | 7.961E-01           | 1.006E+00 | 6.878E-02      | -0.975    |         |
|         | 340.55    |              | 3.248E-01    | 2.021E-01           | 3.250E-01 | 2.072E-02      | 0.999     |         |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         |           | 818.51       |     | 1.145E-02           | 9.431E-02 | 1.594E-01      | 1.217E-02 | 0.072   |
|         |           | 1048.07      | *   | -5.598E-02          | 1.436E-01 | 2.283E-01      | 1.819E-02 | -0.245  |
|         |           | 1235.36      |     | 1.229E+00           | 8.882E-01 | 1.572E+00      | 1.600E-01 | 0.782   |
| BA-137M |           | 661.66       | *   | 2.276E-02           | 4.366E-02 | 7.349E-02      | 3.754E-03 | 0.310   |
| CS-137  |           | 661.66       | *   | 2.405E-02           | 4.613E-02 | 7.764E-02      | 3.988E-03 | 0.310   |
| CE-139  |           | 165.86       | *   | 3.284E-03           | 3.477E-02 | 5.683E-02      | 2.897E-03 | 0.058   |
| BA-140  |           | 162.66       |     | -6.096E-01          | 1.033E+00 | 1.642E+00      | 9.956E-02 | -0.371  |
|         |           | 304.85       |     | 2.485E-01           | 1.892E+00 | 2.793E+00      | 7.983E-01 | 0.089   |
|         |           | 423.72       |     | 2.537E-02           | 2.296E+00 | 3.805E+00      | 1.228E+00 | 0.007   |
|         |           | 537.26       | *   | -2.879E-01          | 3.633E-01 | 5.395E-01      | 1.797E-01 | -0.534  |
| LA-140  |           | 328.76       |     | 4.409E-01           | 3.813E-01 | 6.710E-01      | 4.434E-02 | 0.657   |
|         |           | 487.02       |     | 8.323E-02           | 1.712E-01 | 2.908E-01      | 1.921E-02 | 0.286   |
|         |           | 815.77       |     | -3.321E-02          | 4.121E-01 | 6.854E-01      | 5.969E-02 | -0.048  |
|         |           | 1596.21      | *   | -7.408E-02          | 1.050E-01 | 1.561E-01      | 1.071E-02 | -0.475  |
| CE-141  |           | 145.44       | *   | -1.702E-02          | 7.658E-02 | 1.231E-01      | 6.945E-03 | -0.138  |
| CE-143  |           | 57.36        |     | -1.789E-03          | 7.658E-02 | Half-Life      | too short |         |
|         | +         | 293.27       | *   | 2.049E-03           | 7.658E-02 | Half-Life      | too short |         |
|         |           | 664.57       |     | -2.095E-03          | 7.658E-02 | Half-Life      | too short |         |
|         |           | 721.93       |     | -2.557E-03          | 7.658E-02 | Half-Life      | too short |         |
| CE-144  |           | 80.12        |     | -1.429E+00          | 4.542E+00 | 4.689E+00      | 4.298E-01 | -0.305  |
|         |           | 133.52       | *   | -1.026E-01          | 2.760E-01 | 3.885E-01      | 5.366E-02 | -0.264  |
| PM-144  |           | 476.78       |     | 3.021E-02           | 7.594E-02 | 1.283E-01      | 8.860E-03 | 0.235   |
|         |           | 618.01       |     | -1.631E-02          | 3.760E-02 | 5.891E-02      | 3.401E-03 | -0.277  |
|         |           | 696.49       | *   | -2.513E-02          | 4.811E-02 | 7.471E-02      | 4.203E-03 | -0.336  |
| PR-144  |           | 696.51       | *   | -1.863E+00          | 3.604E+00 | 5.599E+00      | 3.147E-01 | -0.333  |
|         |           | 1489.16      |     | -2.743E+00          | 1.673E+01 | 2.633E+01      | 1.879E+00 | -0.104  |
| PM-146  |           | 453.88       | *   | 6.624E-03           | 5.076E-02 | 8.448E-02      | 7.177E-03 | 0.078   |
|         |           | 633.25       |     | -7.213E-02          | 1.731E+00 | 2.800E+00      | 1.052E+00 | -0.026  |
|         |           | 735.93       |     | -1.538E-01          | 1.912E-01 | 2.787E-01      | 7.633E-02 | -0.552  |
|         |           | 747.24       |     | 4.082E-02           | 1.249E-01 | 2.061E-01      | 2.761E-02 | 0.198   |
| ND-147  | +         | 91.11        |     | 1.023E+00           | 4.218E-01 | 6.809E-01      | 6.698E-02 | 1.502   |
|         |           | 319.41       |     | -1.260E+00          | 4.037E+00 | 6.658E+00      | 3.934E-01 | -0.189  |
|         |           | 531.02       | *   | 1.506E-01           | 7.571E-01 | 1.256E+00      | 1.697E-01 | 0.120   |
| PM-149  |           | 285.90       | *   | 1.126E+01           | 1.560E+02 | 2.637E+02      | 3.743E+01 | 0.043   |
| EU-152  |           | 121.78       |     | 2.139E-02           | 9.002E-02 | 1.444E-01      | 1.106E-02 | 0.148   |
|         |           | 244.70       |     | 2.011E-01           | 4.068E-01 | 5.893E-01      | 3.333E-02 | 0.341   |
|         |           | 344.28       | *   | -8.902E-02          | 1.398E-01 | 1.810E-01      | 1.199E-02 | -0.492  |
|         |           | 778.90       |     | -3.546E-02          | 3.516E-01 | 5.034E-01      | 3.493E-02 | -0.070  |
|         | +         | 964.08       |     | 8.131E-01           | 4.147E-01 | 7.203E-01      | 6.137E-02 | 1.129   |
|         |           | 1085.87      |     | 2.765E-01           | 4.553E-01 | 7.922E-01      | 5.573E-02 | 0.349   |
|         |           | 1112.07      |     | 9.672E-02           | 4.546E-01 | 7.064E-01      | 4.695E-02 | 0.137   |
|         |           | 1408.01      |     | 2.645E-02           | 2.217E-01 | 3.644E-01      | 2.650E-02 | 0.073   |
| GD-153  |           | 69.67        |     | 2.531E-01           | 2.518E+00 | 3.718E+00      | 3.249E-01 | 0.068   |
|         |           | 97.43        | *   | -4.912E-02          | 1.128E-01 | 1.590E-01      | 1.299E-02 | -0.309  |
|         |           | 103.18       |     | -9.434E-02          | 1.381E-01 | 2.226E-01      | 1.663E-02 | -0.424  |
| EU-154  |           | 123.07       |     | 2.606E-02           | 6.892E-02 | 1.013E-01      | 9.550E-03 | 0.257   |
|         |           | 723.31       |     | -1.272E-02          | 2.677E-01 | 3.696E-01      | 2.671E-02 | -0.034  |
|         |           | 873.19       |     | -1.388E-01          | 3.376E-01 | 5.422E-01      | 6.453E-02 | -0.256  |
|         |           | 996.26       |     | -2.897E-01          | 4.358E-01 | 6.717E-01      | 1.159E-01 | -0.431  |



----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| EU-155  | +         | 1004.73      |     | -3.363E-01          | 2.942E-01 | 4.336E-01      | 4.876E-02 | -0.776  |
|         |           | 1274.44      | *   | -9.341E-02          | 1.666E-01 | 2.563E-01      | 2.564E-02 | -0.364  |
|         |           | 86.55        |     | 4.679E-01           | 1.575E-01 | 2.185E-01      | 2.124E-02 | 2.141   |
|         |           | 105.31       | *   | 1.877E-01           | 1.314E-01 | 2.264E-01      | 1.668E-02 | 0.829   |
| TB-160  | +         | 86.79        |     | 1.255E+00           | 4.222E-01 | 5.821E-01      | 5.624E-02 | 2.156   |
|         |           | 197.04       |     | -8.544E-01          | 6.531E-01 | 9.917E-01      | 5.279E-02 | -0.862  |
|         |           | 215.65       |     | 4.987E-01           | 9.405E-01 | 1.500E+00      | 8.194E-02 | 0.333   |
|         |           | 298.57       |     | 3.031E-01           | 2.033E-01 | 2.487E-01      | 1.461E-02 | 1.219   |
|         | +         | 879.36       | *   | 6.756E-02           | 1.731E-01 | 2.977E-01      | 2.604E-02 | 0.227   |
|         |           | 962.29       |     | 1.545E+00           | 7.878E-01 | 1.253E+00      | 1.070E-01 | 1.233   |
|         |           | 966.15       |     | 1.815E+00           | 3.921E-01 | 7.200E-01      | 6.120E-02 | 2.521   |
|         |           | 1177.93      |     | 5.416E-02           | 4.692E-01 | 7.761E-01      | 4.415E-02 | 0.070   |
| HO-166M | +         | 1271.85      |     | -8.761E-02          | 9.118E-01 | 1.465E+00      | 9.780E-02 | -0.060  |
|         |           | 80.57        |     | -1.192E-01          | 4.923E-01 | 5.114E-01      | 4.702E-02 | -0.233  |
|         |           | 184.41       |     | 9.960E-02           | 6.231E-02 | 7.581E-02      | 3.962E-03 | 1.314   |
|         |           | 280.46       |     | -3.886E-02          | 9.845E-02 | 1.630E-01      | 9.492E-03 | -0.238  |
|         | +         | 410.95       |     | 1.447E-01           | 2.674E-01 | 4.581E-01      | 2.663E-02 | 0.316   |
|         |           | 711.68       | *   | 2.749E-02           | 7.284E-02 | 1.211E-01      | 7.087E-03 | 0.227   |
|         |           | 752.31       |     | 6.291E-03           | 3.524E-01 | 5.671E-01      | 3.685E-02 | 0.011   |
|         |           | 810.29       |     | 1.130E-03           | 6.987E-02 | 1.172E-01      | 8.765E-03 | 0.010   |
| TA-182  | +         | 67.75        |     | -3.778E-02          | 1.470E-01 | 2.430E-01      | 2.115E-02 | -0.156  |
|         |           | 100.11       |     | 1.029E-01           | 2.155E-01 | 3.509E-01      | 2.746E-02 | 0.293   |
|         |           | 152.43       |     | 3.303E-01           | 4.146E-01 | 6.968E-01      | 3.683E-02 | 0.474   |
|         |           | 222.11       |     | -3.232E-01          | 4.227E-01 | 6.557E-01      | 3.613E-02 | -0.493  |
|         | +         | 1121.30      |     | 7.041E-01           | 3.683E-01 | 3.862E-01      | 2.511E-02 | 1.823   |
|         |           | 1189.05      |     | 1.574E-01           | 3.925E-01 | 6.646E-01      | 3.856E-02 | 0.237   |
|         |           | 1221.41      | *   | 1.359E-01           | 2.784E-01 | 4.715E-01      | 2.894E-02 | 0.288   |
|         |           | 1231.02      |     | -6.786E-01          | 7.029E-01 | 1.063E+00      | 6.631E-02 | -0.638  |
| IR-192  | +         | 295.96       |     | 9.457E-01           | 2.212E-01 | 3.205E-01      | 1.911E-02 | 2.951   |
|         |           | 308.46       |     | -2.246E-02          | 1.147E-01 | 1.907E-01      | 1.136E-02 | -0.118  |
|         |           | 316.51       | *   | -1.762E-02          | 3.946E-02 | 6.463E-02      | 3.834E-03 | -0.273  |
|         |           | 468.07       |     | -1.768E-03          | 7.991E-02 | 1.315E-01      | 8.873E-03 | -0.013  |
| HG-203  | +         | 70.83        |     | 4.962E-01           | 1.931E+00 | 2.867E+00      | 4.627E-01 | 0.173   |
|         |           | 72.87        |     | 6.849E+00           | 1.680E+00 | 1.967E+00      | 3.078E-01 | 3.482   |
|         |           | 279.20       | *   | 2.138E-02           | 4.506E-02 | 7.756E-02      | 4.764E-03 | 0.276   |
|         |           | 72.81        |     | 6.984E-01           | 2.807E-01 | 4.410E-01      | 3.890E-02 | 1.584   |
| BI-207  | +         | 74.97        |     | 9.320E-01           | 1.943E-01 | 3.145E-01      | 2.799E-02 | 2.964   |
|         |           | 569.70       |     | -1.297E-02          | 3.679E-02 | 5.847E-02      | 3.294E-03 | -0.222  |
|         |           | 1063.66      | *   | 3.940E-02           | 6.297E-02 | 1.097E-01      | 8.056E-03 | 0.359   |
|         |           | 1770.23      |     | -7.150E-01          | 6.618E-01 | 9.060E-01      | 5.609E-02 | -0.789  |
| PB-210  |           | 46.54        | *   | -8.187E-02          | 6.107E+00 | 1.015E+01      | 7.844E-01 | -0.008  |
| PB-211  |           | 404.85       | *   | -5.618E-01          | 9.090E-01 | 1.387E+00      | 6.655E-01 | -0.405  |
|         | +         | 427.09       |     | -6.719E-01          | 1.691E+00 | 2.677E+00      | 1.227E+00 | -0.251  |
|         |           | 832.01       |     | 3.399E-01           | 1.241E+00 | 2.097E+00      | 1.085E+00 | 0.162   |
|         |           | 727.33       | *   | 2.344E+00           | 1.154E+00 | 1.298E+00      | 1.411E-01 | 1.806   |
|         |           | 785.37       |     | 2.628E+00           | 3.740E+00 | 6.593E+00      | 4.647E-01 | 0.399   |
| RN-219  | +         | 1620.50      |     | 3.450E+00           | 2.760E+00 | 5.377E+00      | 3.647E-01 | 0.642   |
|         |           | 271.23       |     | 3.563E-01           | 3.429E-01 | 5.081E-01      | 4.077E-02 | 0.701   |
|         |           | 401.81       | *   | -5.948E-02          | 4.914E-01 | 8.101E-01      | 1.088E-01 | -0.073  |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Activity Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|--------------|---------------------|-----------|----------------|-----------|---------|
| RA-223  |           | 81.07        |              | 1.927E-01           | 3.633E-01 | 4.023E-01      | 3.712E-02 | 0.479   |
|         |           | 83.79        |              | 2.765E-01           | 1.456E-01 | 2.499E-01      | 2.354E-02 | 1.107   |
|         |           | 94.87        |              | 1.230E+00           | 5.989E-01 | 9.402E-01      | 8.026E-02 | 1.308   |
|         |           | 144.24       |              | 3.321E-01           | 8.065E-01 | 1.328E+00      | 9.164E-02 | 0.250   |
|         |           | 154.21       |              | 2.482E-01           | 4.634E-01 | 7.711E-01      | 5.030E-02 | 0.322   |
|         | +         | 269.46       |              | 3.758E-01           | 3.476E-01 | 3.974E-01      | 2.398E-02 | 0.946   |
|         |           | 323.87       | *            | -7.438E-01          | 7.933E-01 | 1.254E+00      | 2.026E-01 | -0.593  |
| AC-227  | +         | 338.28       |              | 7.981E+00           | 2.035E+00 | 2.775E+00      | 2.861E-01 | 2.876   |
|         |           | 79.69        |              | 8.113E-01           | 2.217E+00 | 2.419E+00      | 4.233E-01 | 0.335   |
|         |           | 235.96       |              | 1.934E+00           | 2.975E-01 | 4.722E-01      | 3.779E-02 | 4.094   |
|         |           | 256.23       | *            | -8.060E-02          | 2.981E-01 | 4.701E-01      | 4.786E-02 | -0.171  |
|         | +         | 299.98       |              | 2.341E+00           | 1.585E+00 | 1.960E+00      | 2.162E-01 | 1.194   |
|         |           | 304.50       |              | 3.256E-01           | 2.138E+00 | 3.161E+00      | 4.831E-01 | 0.103   |
|         |           | 334.37       |              | 1.485E+00           | 2.162E+00 | 3.297E+00      | 4.704E-01 | 0.450   |
| TH-227  |           | 79.80        |              | 8.775E-01           | 2.916E+00 | 3.164E+00      | 6.959E-01 | 0.277   |
|         |           | 235.96       |              | 1.934E+00           | 2.900E-01 | 4.722E-01      | 3.415E-02 | 4.094   |
|         |           | 256.23       | *            | -8.060E-02          | 2.982E-01 | 4.701E-01      | 5.632E-02 | -0.171  |
|         | +         | 299.98       |              | 2.341E+00           | 1.585E+00 | 1.960E+00      | 2.162E-01 | 1.194   |
|         |           | 304.50       |              | 3.256E-01           | 2.138E+00 | 3.161E+00      | 4.831E-01 | 0.103   |
|         |           | 334.37       |              | 1.485E+00           | 2.162E+00 | 3.297E+00      | 4.704E-01 | 0.450   |
|         |           | 283.69       | *            | 5.586E-01           | 1.662E+00 | 2.843E+00      | 3.733E-01 | 0.197   |
| PA-231  | +         | 301.36       |              | 1.504E+00           | 1.017E+00 | 1.241E+00      | 1.289E-01 | 1.212   |
| TH-231  |           | 81.07        |              | 1.927E-01           | 3.633E-01 | 4.023E-01      | 3.712E-02 | 0.479   |
|         |           | 83.79        |              | 2.765E-01           | 1.456E-01 | 2.499E-01      | 2.354E-02 | 1.107   |
|         |           | 94.87        |              | 1.230E+00           | 5.989E-01 | 9.402E-01      | 8.026E-02 | 1.308   |
|         |           | 144.24       |              | 3.321E-01           | 8.065E-01 | 1.328E+00      | 9.164E-02 | 0.250   |
|         |           | 154.21       |              | 2.482E-01           | 4.634E-01 | 7.711E-01      | 5.030E-02 | 0.322   |
|         | +         | 269.46       |              | 3.758E-01           | 3.476E-01 | 3.974E-01      | 2.398E-02 | 0.946   |
|         |           | 323.87       | *            | -7.438E-01          | 7.933E-01 | 1.254E+00      | 2.026E-01 | -0.593  |
| PA-233  | +         | 338.28       |              | 7.981E+00           | 2.035E+00 | 2.775E+00      | 2.861E-01 | 2.876   |
|         | +         | 300.13       |              | 1.059E+00           | 7.218E-01 | 8.865E-01      | 1.190E-01 | 1.195   |
|         |           | 311.90       | *            | 3.379E-02           | 7.323E-02 | 1.258E-01      | 7.864E-03 | 0.269   |
|         |           | 340.48       |              | 1.541E+00           | 8.918E-01 | 1.339E+00      | 3.112E-01 | 1.151   |
|         |           | 94.67        |              | 6.445E-01           | 2.288E-01 | 3.543E-01      | 4.381E-02 | 1.819   |
|         |           | 98.44        |              | 6.422E-02           | 1.251E-01 | 1.777E-01      | 9.896E-02 | 0.362   |
|         |           | 111.00       |              | -1.264E-01          | 2.154E-01 | 3.468E-01      | 3.751E-02 | -0.364  |
| PA-234  |           | 131.20       |              | 1.276E-01           | 1.422E-01 | 2.137E-01      | 1.208E-02 | 0.597   |
|         |           | 569.50       |              | -9.317E-02          | 3.212E-01 | 5.127E-01      | 2.889E-02 | -0.182  |
|         |           | 733.00       |              | 1.138E-01           | 5.171E-01 | 7.358E-01      | 1.572E-01 | 0.155   |
|         |           | 880.51       |              | 1.403E-01           | 3.380E-01 | 5.828E-01      | 5.110E-02 | 0.241   |
|         |           | 883.24       |              | -1.333E-01          | 3.681E-01 | 5.764E-01      | 3.876E-01 | -0.231  |
|         |           | 926.50       |              | -4.449E-02          | 1.990E-01 | 3.233E-01      | 8.200E-02 | -0.138  |
|         |           | 946.00       | *            | 4.329E-01           | 3.812E-01 | 6.774E-01      | 1.273E-01 | 0.639   |
|         |           | 949.00       |              | -2.636E-02          | 5.356E-01 | 8.851E-01      | 7.672E-02 | -0.030  |
|         | PA-234M   | 766.42       |              | 2.895E+01           | 2.039E+01 | 2.628E+01      | 1.326E+01 | 1.102   |
|         |           | 1001.03      | *            | -3.310E-01          | 5.517E+00 | 9.080E+00      | 8.664E-01 | -0.036  |
|         | TH-234    | 63.29        | *            | 2.302E+00           | 1.924E+00 | 3.256E+00      | 5.989E-01 | 0.707   |
|         | +         | 92.59        |              | 3.288E+00           | 1.285E+00 | 1.541E+00      | 3.421E-01 | 2.133   |
|         | U-238     | 63.29        | *            | 2.302E+00           | 1.924E+00 | 3.256E+00      | 5.989E-01 | 0.707   |

----- Non-Identified Nuclides -----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| NP-239  | +         | 92.59        |     | 3.288E+00           | 1.098E+00 | 1.541E+00      | 1.372E-01 | 2.133   |
|         |           | 99.53        |     | 1.400E-01           | 2.073E-01 | 3.239E-01      | 2.557E-02 | 0.432   |
|         |           | 103.37       |     | -2.547E-02          | 1.239E-01 | 2.034E-01      | 1.515E-02 | -0.125  |
|         |           | 106.12       |     | 1.341E-01           | 1.047E-01 | 1.796E-01      | 1.288E-02 | 0.747   |
|         |           | 117.23       | *   | -2.106E-02          | 4.953E-01 | 7.988E-01      | 4.972E-02 | -0.026  |
|         |           | 228.18       |     | -2.018E-01          | 2.616E-01 | 4.051E-01      | 2.249E-02 | -0.498  |
|         |           | 277.60       |     | 1.988E-01           | 2.111E-01 | 3.526E-01      | 2.050E-02 | 0.564   |
| AM-241  |           | 59.54        | *   | -3.284E-01          | 2.275E-01 | 3.596E-01      | 3.346E-02 | -0.913  |
| CM-247  |           | 278.00       |     | 5.893E-01           | 8.468E-01 | 1.471E+00      | 8.555E-02 | 0.401   |
|         |           | 287.50       |     | 6.086E-01           | 1.521E+00 | 2.474E+00      | 1.446E-01 | 0.246   |
| CF-249  |           | 402.40       | *   | 1.937E-02           | 4.451E-02 | 7.569E-02      | 4.387E-03 | 0.256   |
|         |           | 252.80       |     | 6.022E-01           | 1.092E+00 | 1.799E+00      | 1.026E-01 | 0.335   |
|         |           | 333.37       |     | 1.964E-01           | 2.197E-01 | 3.416E-01      | 2.018E-02 | 0.575   |
| CF-251  |           | 388.16       | *   | -7.672E-04          | 4.692E-02 | 7.796E-02      | 4.510E-03 | -0.010  |
|         |           | 177.52       | *   | 2.473E-02           | 1.538E-01 | 2.513E-01      | 1.301E-02 | 0.098   |
|         |           | 227.38       |     | -2.046E-01          | 4.219E-01 | 6.628E-01      | 3.677E-02 | -0.309  |
|         |           | 285.41       |     | -1.015E+00          | 2.526E+00 | 4.175E+00      | 2.438E-01 | -0.243  |

# VAX/VMS Nuclide Identification Report Generated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054949      *
* Acquisition date   : 11-MAR-2010 19:27:29 Detector SN# :                   *
* Detector ID        : GAM23 Sensitivity      : 5.000                       *
* Geometry           : CAN Energy tolerance: 1.800                       *
* Elapsed live time  : 0 02:00:00.00 Abundance limit : 75.000             *
* Elapsed real time  : 0 02:00:01.81 Half life ratio : 8.000              *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date       : 23-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID         : G1202054949 Analyst initials: MXR1                 *
* Batch Number      : 958216 Sample Quantity : 1.2698E+02 GRAM           *
* Recovery          : 1.00000 Carrier Weight : 0.00000                   *
*****
*
*                                     QC DATA                               *
*
* Standard Weight   : 0.00000                                              *
* CALIB. DATE/TIME  : 2-JUN-2009 11:17:00 MS Isotope :                   *
* MSD DPM           : 0.000 MSD Isotope :                               *
* LCS DPM           : 0.000 LCS Isotope :                               *
* LCSD DPM          : 0.000 LCSD Isotope :                               *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act error | MDA<br>(pCi/GRAM ) |           |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.544E+01               | 3.312E+00 | 6.285E-01          | 0.000E+00 |
| CD-109  | 3.953E+00               | 1.303E+00 | 1.453E+00          | 0.000E+00 |
| SN-126  | 3.857E-01               | 1.272E-01 | 1.427E-01          | 0.000E+00 |
| CS-135  | 3.265E-01               | 2.963E-01 | 2.924E-01          | 0.000E+00 |
| TL-208  | 6.016E-01               | 1.038E-01 | 6.595E-02          | 0.000E+00 |
| BI-211  | 3.755E+00               | 5.341E-01 | 4.078E-01          | 0.000E+00 |
| PB-212  | 1.841E+00               | 1.792E-01 | 1.076E-01          | 0.000E+00 |
| BI-214  | 1.247E+00               | 2.232E-01 | 1.391E-01          | 0.000E+00 |
| PB-214  | 1.363E+00               | 2.074E-01 | 1.455E-01          | 0.000E+00 |
| RA-224  | 4.902E+00               | 1.409E+00 | 1.153E+00          | 0.000E+00 |
| RA-226  | 1.247E+00               | 2.232E-01 | 1.391E-01          | 0.000E+00 |
| AC-228  | 2.217E+00               | 4.413E-01 | 2.789E-01          | 0.000E+00 |
| RA-228  | 2.217E+00               | 4.413E-01 | 2.789E-01          | 0.000E+00 |
| TH-228  | 1.841E+00               | 1.792E-01 | 1.076E-01          | 0.000E+00 |
| TH-229  | 5.579E-01               | 5.994E-01 | 1.059E+00          | 0.000E+00 |
| TH-232  | 2.217E+00               | 4.413E-01 | 2.789E-01          | 0.000E+00 |
| U-235   | 1.400E-01               | 2.337E-01 | 4.074E-01          | 0.000E+00 |
| NP-237  | 1.151E+00               | 4.471E-01 | 4.322E-01          | 0.000E+00 |
| ANH-511 | 2.026E-01               | 6.373E-02 | 5.369E-02          | 0.000E+00 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | 8.886E-02                           | 3.708E-01                | 6.434E-01          | 0.000E+00 NOT IDENT. |
| NA-22   | -3.138E-02                          | 5.775E-02                | 9.119E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 3.191E+06                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| SC-46   | 1.969E-02                           | 4.620E-02                | 8.190E-02          | 0.000E+00 FAIL ABUN  |
| V-48    | 8.106E-03                           | 9.034E-02                | 1.548E-01          | 0.000E+00 NOT IDENT. |
| CR-51   | -2.642E-01                          | 4.279E-01                | 7.247E-01          | 0.000E+00 NOT IDENT. |
| MN-54   | 8.766E-03                           | 4.822E-02                | 8.397E-02          | 0.000E+00 NOT IDENT. |
| CO-56   | 1.200E-02                           | 4.833E-02                | 8.464E-02          | 0.000E+00 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CO-57   | 6.173E-03  | 3.069E-02 | 5.202E-02 | 0.000E+00 | NOT IDENT. |
| CO-58   | -2.450E-02 | 4.792E-02 | 7.926E-02 | 0.000E+00 | NOT IDENT. |
| FE-59   | 8.418E-02  | 1.132E-01 | 2.028E-01 | 0.000E+00 | NOT IDENT. |
| CO-60   | 8.448E-03  | 4.519E-02 | 7.671E-02 | 0.000E+00 | NOT IDENT. |
| ZN-65   | 1.406E-01  | 1.456E-01 | 2.313E-01 | 0.000E+00 | NOT IDENT. |
| SE-75   | -2.407E-02 | 6.192E-02 | 8.771E-02 | 0.000E+00 | NOT IDENT. |
| SR-85   | 5.684E-03  | 4.663E-02 | 6.947E-02 | 0.000E+00 | NOT IDENT. |
| Y-88    | 4.789E-03  | 4.045E-02 | 6.938E-02 | 0.000E+00 | NOT IDENT. |
| Y-91    | 9.403E+00  | 2.857E+01 | 4.906E+01 | 0.000E+00 | NOT IDENT. |
| NB-94   | 1.695E-02  | 4.258E-02 | 7.290E-02 | 0.000E+00 | NOT IDENT. |
| NB-95   | 9.354E-02  | 6.079E-02 | 1.002E-01 | 0.000E+00 | NOT IDENT. |
| NB-95M  | 0.000E+00  | 1.984E-01 | 3.408E-01 | 0.000E+00 | NOT IDENT. |
| ZR-95   | 7.818E-02  | 9.020E-02 | 1.594E-01 | 0.000E+00 | NOT IDENT. |
| MO-99   | -1.310E+00 | 2.081E+01 | 3.431E+01 | 0.000E+00 | NOT IDENT. |
| TC-99M  | 0.000E+00  | 1.267E+18 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | 2.332E-02  | 4.654E-02 | 8.186E-02 | 0.000E+00 | FAIL ABUN  |
| RH-106  | 1.100E-01  | 3.746E-01 | 6.425E-01 | 0.000E+00 | NOT IDENT. |
| RU-106  | 1.100E-01  | 3.745E-01 | 6.425E-01 | 0.000E+00 | NOT IDENT. |
| AG-108M | -1.880E-02 | 3.225E-02 | 5.326E-02 | 0.000E+00 | NOT IDENT. |
| AG-110M | -1.489E-02 | 4.220E-02 | 6.859E-02 | 0.000E+00 | NOT IDENT. |
| SN-113  | -1.385E-03 | 5.301E-02 | 9.156E-02 | 0.000E+00 | NOT IDENT. |
| CD-115  | -1.889E+00 | 1.949E+01 | 3.285E+01 | 0.000E+00 | NOT IDENT. |
| SN-117M | 6.137E-02  | 6.798E-02 | 1.207E-01 | 0.000E+00 | NOT IDENT. |
| TE-123M | 3.718E-02  | 3.323E-02 | 5.946E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | 4.776E-02  | 8.114E-02 | 1.517E-01 | 0.000E+00 | NOT IDENT. |
| SB-125  | -6.821E-02 | 9.875E-02 | 1.620E-01 | 0.000E+00 | NOT IDENT. |
| TE-125M | -1.009E+01 | 1.172E+01 | 1.981E+01 | 0.000E+00 | NOT IDENT. |
| I-126   | -2.546E-02 | 2.901E-01 | 4.814E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | 2.873E-02  | 2.136E-01 | 3.105E-01 | 0.000E+00 | NOT IDENT. |
| SB-127  | -8.091E-01 | 1.930E+00 | 3.102E+00 | 0.000E+00 | NOT IDENT. |
| I-131   | 1.399E-01  | 1.416E-01 | 2.590E-01 | 0.000E+00 | NOT IDENT. |
| TE-132  | -8.840E-01 | 1.127E+00 | 1.820E+00 | 0.000E+00 | NOT IDENT. |
| BA-133  | 2.934E-02  | 5.415E-02 | 8.514E-02 | 0.000E+00 | NOT IDENT. |
| I-133   | 0.000E+00  | 1.877E+04 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | 9.409E-02  | 5.848E-02 | 1.017E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 1.638E+17 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -5.598E-02 | 1.407E-01 | 2.294E-01 | 0.000E+00 | NOT IDENT. |
| BA-137M | 2.276E-02  | 4.279E-02 | 7.436E-02 | 0.000E+00 | NOT IDENT. |
| CS-137  | 2.405E-02  | 4.520E-02 | 7.855E-02 | 0.000E+00 | NOT IDENT. |
| CE-139  | 3.284E-03  | 3.408E-02 | 5.868E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | -2.879E-01 | 3.560E-01 | 5.476E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | -7.408E-02 | 1.029E-01 | 1.558E-01 | 0.000E+00 | NOT IDENT. |
| CE-141  | -1.702E-02 | 7.505E-02 | 1.274E-01 | 0.000E+00 | NOT IDENT. |
| CE-143  | 0.000E+00  | 6.333E+02 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CE-144  | -1.026E-01 | 2.705E-01 | 4.024E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | -2.513E-02 | 4.715E-02 | 7.553E-02 | 0.000E+00 | NOT IDENT. |
| PR-144  | -1.863E+00 | 3.532E+00 | 5.661E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | 6.624E-03  | 4.974E-02 | 8.596E-02 | 0.000E+00 | NOT IDENT. |
| ND-147  | 1.506E-01  | 7.419E-01 | 1.275E+00 | 0.000E+00 | FAIL ABUN  |
| PM-149  | 1.126E+01  | 1.529E+02 | 2.701E+02 | 0.000E+00 | NOT IDENT. |
| EU-152  | -8.902E-02 | 1.370E-01 | 1.850E-01 | 0.000E+00 | FAIL ABUN  |
| GD-153  | -4.912E-02 | 1.105E-01 | 1.654E-01 | 0.000E+00 | NOT IDENT. |
| EU-154  | -9.341E-02 | 1.633E-01 | 2.568E-01 | 0.000E+00 | NOT IDENT. |
| EU-155  | 1.877E-01  | 1.288E-01 | 2.353E-01 | 0.000E+00 | FAIL ABUN  |
| TB-160  | 6.756E-02  | 1.696E-01 | 3.000E-01 | 0.000E+00 | FAIL ABUN  |
| HO-166M | 2.749E-02  | 7.138E-02 | 1.224E-01 | 0.000E+00 | FAIL ABUN  |
| TA-182  | 1.359E-01  | 2.729E-01 | 4.726E-01 | 0.000E+00 | FAIL ABUN  |
| IR-192  | -1.762E-02 | 3.867E-02 | 6.611E-02 | 0.000E+00 | FAIL ABUN  |
| HG-203  | 2.138E-02  | 4.416E-02 | 7.948E-02 | 0.000E+00 | FAIL ABUN  |
| BI-207  | 3.940E-02  | 6.171E-02 | 1.102E-01 | 0.000E+00 | FAIL ABUN  |
| PB-210  | -8.187E-02 | 5.985E+00 | 1.067E+01 | 0.000E+00 | NOT IDENT. |
| PB-211  | -5.618E-01 | 8.908E-01 | 1.414E+00 | 0.000E+00 | NOT IDENT. |
| BI-212  | 0.000E+00  | 1.131E+00 | 1.311E+00 | 0.000E+00 | FAIL ABUN  |
| RN-219  | -5.948E-02 | 4.815E-01 | 8.258E-01 | 0.000E+00 | NOT IDENT. |
| RA-223  | -7.438E-01 | 7.775E-01 | 1.282E+00 | 0.000E+00 | FAIL ABUN  |
| AC-227  | -8.060E-02 | 2.922E-01 | 4.824E-01 | 0.000E+00 | FAIL ABUN  |
| TH-227  | -8.060E-02 | 2.922E-01 | 4.824E-01 | 0.000E+00 | FAIL ABUN  |
| PA-231  | 5.586E-01  | 1.629E+00 | 2.912E+00 | 0.000E+00 | FAIL ABUN  |
| TH-231  | -7.438E-01 | 7.775E-01 | 1.282E+00 | 0.000E+00 | FAIL ABUN  |
| PA-233  | 3.379E-02  | 7.177E-02 | 1.287E-01 | 0.000E+00 | FAIL ABUN  |
| PA-234  | 4.329E-01  | 3.735E-01 | 6.817E-01 | 0.000E+00 | NOT IDENT. |
| PA-234M | -3.310E-01 | 5.407E+00 | 9.130E+00 | 0.000E+00 | NOT IDENT. |
| TH-234  | 2.302E+00  | 1.885E+00 | 3.408E+00 | 0.000E+00 | FAIL ABUN  |
| U-238   | 2.302E+00  | 1.885E+00 | 3.408E+00 | 0.000E+00 | FAIL ABUN  |
| NP-239  | -2.106E-02 | 4.854E-01 | 8.289E-01 | 0.000E+00 | NOT IDENT. |
| AM-241  | -3.284E-01 | 2.229E-01 | 3.767E-01 | 0.000E+00 | NOT IDENT. |
| CM-247  | 1.937E-02  | 4.362E-02 | 7.715E-02 | 0.000E+00 | NOT IDENT. |
| CF-249  | -7.672E-04 | 4.598E-02 | 7.950E-02 | 0.000E+00 | NOT IDENT. |

|        |           |           |           |                      |
|--------|-----------|-----------|-----------|----------------------|
| CF-251 | 2.473E-02 | 1.507E-01 | 2.593E-01 | 0.000E+00 NOT IDENT. |
|--------|-----------|-----------|-----------|----------------------|

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29414                    *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054949.CNF;1
Sample date       : 23-FEB-2010 12:00:00 Acquisition date : 11-MAR-2010 19:27:29
Sample ID        : G1202054949 Sample quantity : 1.26980E+02 GRAM
Detector name    : GAM23 Detector geometry: CAN
Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:01.81 0.0%
Energy tolerance : 1.80000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 5.00000
Batch ID        : 958216 Detector SN# :
Matrix Spike ID  : LCS ID : 1032-A
*****

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## Nuclide Line Activity Report

## Nuclide Type:

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected pCi/GRAM | Decay Corr pCi/GRAM | 2-Sigma %Error |
|---------|---------|-------|--------|-----------|----------------------|---------------------|----------------|
| K-40    | 1460.82 | 1275  | 10.66* | 9.976E-01 | 3.544E+01            | 3.544E+01           | 9.53           |
| CD-109  | 88.03   | 252   | 3.70*  | 5.214E+00 | 3.857E+00            | 3.953E+00           | 33.64          |
| SN-126  | 64.28   | ----- | 9.60   | 2.723E+00 | -----                | Line Not Found      | -----          |
|         | 86.94   | 252   | 8.90   | 5.214E+00 | 1.604E+00            | 1.604E+00           | 52.61          |
|         | 87.57   | 252   | 37.00* | 5.214E+00 | 3.857E-01            | 3.857E-01           | 33.64          |
| CS-135  | 268.22  | 75    | 16.00* | 4.232E+00 | 3.265E-01            | 3.265E-01           | 92.60          |
| TL-208  | 277.37  | ----- | 6.60   | 4.139E+00 | -----                | Line Not Found      | -----          |
|         | 583.19  | 394   | 85.00* | 2.279E+00 | 6.016E-01            | 6.016E-01           | 17.60          |
|         | 860.56  | 63    | 12.50  | 1.610E+00 | 9.321E-01            | 9.321E-01           | 57.82          |
| BI-211  | 72.87   | 454   | 1.23   | 4.034E+00 | 2.703E+01            | 2.703E+01           | 20.85          |
|         | 351.06  | 565   | 12.92* | 3.442E+00 | 3.755E+00            | 3.755E+00           | 14.51          |
| PB-212  | 74.82   | 454   | 10.28  | 4.034E+00 | 3.234E+00            | 3.234E+00           | 23.00          |
|         | 77.11   | 657   | 17.10  | 4.298E+00 | 2.644E+00            | 2.644E+00           | 15.57          |
|         | 238.63  | 1259  | 43.60* | 4.639E+00 | 1.841E+00            | 1.841E+00           | 9.94           |
|         | 300.09  | 93    | 3.30   | 3.897E+00 | 2.128E+00            | 2.128E+00           | 67.35          |
| BI-214  | 609.32  | 421   | 45.49* | 2.194E+00 | 1.247E+00            | 1.247E+00           | 18.27          |
|         | 1120.29 | 95    | 14.92  | 1.258E+00 | 1.492E+00            | 1.492E+00           | 52.74          |
|         | 1764.49 | 37    | 15.30  | 8.743E-01 | 8.241E-01            | 8.241E-01           | 64.16          |
| PB-214  | 74.82   | 454   | 5.80   | 4.034E+00 | 5.731E+00            | 5.731E+00           | 22.30          |
|         | 77.11   | 657   | 9.70   | 4.298E+00 | 4.661E+00            | 4.661E+00           | 17.62          |
|         | 242.00  | 313   | 7.25   | 4.597E+00 | 2.772E+00            | 2.772E+00           | 29.90          |
|         | 295.22  | 311   | 18.42  | 3.950E+00 | 1.265E+00            | 1.265E+00           | 24.26          |
|         | 351.93  | 565   | 35.60* | 3.442E+00 | 1.363E+00            | 1.363E+00           | 15.53          |
| RA-224  | 240.99  | 313   | 4.10*  | 4.597E+00 | 4.902E+00            | 4.902E+00           | 29.33          |
| RA-226  | 609.32  | 421   | 45.49* | 2.194E+00 | 1.247E+00            | 1.247E+00           | 18.27          |
|         | 1120.29 | 95    | 14.92  | 1.258E+00 | 1.492E+00            | 1.492E+00           | 52.74          |
|         | 1764.49 | 37    | 15.30  | 8.743E-01 | 8.241E-01            | 8.241E-01           | 64.16          |
| AC-228  | 338.32  | 272   | 11.27  | 3.550E+00 | 2.011E+00            | 2.011E+00           | 47.38          |
|         | 911.20  | 295   | 25.80* | 1.527E+00 | 2.217E+00            | 2.217E+00           | 20.32          |
|         | 968.97  | 183   | 15.80  | 1.442E+00 | 2.376E+00            | 2.376E+00           | 31.40          |
| RA-228  | 338.32  | 272   | 11.27  | 3.550E+00 | 2.011E+00            | 2.011E+00           | 47.38          |
|         | 911.20  | 295   | 25.80* | 1.527E+00 | 2.217E+00            | 2.217E+00           | 20.32          |

Nuclide Type:

| Nuclide | Energy | Area  | %Abn    | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|--------|-------|---------|-----------|-------------------------|------------------------|-------------------|
| TH-228  | 968.97 | 183   | 15.80   | 1.442E+00 | 2.376E+00               | 2.376E+00              | 31.40             |
|         | 74.82  | 454   | 10.28   | 4.034E+00 | 3.234E+00               | 3.234E+00              | 20.88             |
|         | 77.11  | 657   | 17.10   | 4.298E+00 | 2.644E+00               | 2.644E+00              | 15.57             |
|         | 238.63 | 1259  | 43.60*  | 4.639E+00 | 1.841E+00               | 1.841E+00              | 9.94              |
| TH-229  | 300.09 | 93    | 3.30    | 3.897E+00 | 2.128E+00               | 2.128E+00              | 90.40             |
|         | 85.43  | 252   | 14.70   | 5.214E+00 | 9.709E-01               | 9.709E-01              | 33.64             |
|         | 88.47  | 186   | 24.00   | 5.403E+00 | 4.235E-01               | 4.235E-01              | 41.09             |
|         | 193.51 | ----- | 4.41*   | 5.353E+00 | -----                   | Line Not Found         | -----             |
| TH-232  | 210.85 | ----- | 2.80    | 5.059E+00 | -----                   | Line Not Found         | -----             |
|         | 338.32 | 272   | 11.27   | 3.550E+00 | 2.011E+00               | 2.011E+00              | 24.05             |
|         | 911.20 | 295   | 25.80*  | 1.527E+00 | 2.217E+00               | 2.217E+00              | 20.32             |
|         | 968.97 | 183   | 15.80   | 1.442E+00 | 2.376E+00               | 2.376E+00              | 31.40             |
| U-235   | 89.96  | 186   | 3.47    | 5.403E+00 | 2.929E+00               | 2.929E+00              | 47.11             |
|         | 93.35  | 263   | 5.60    | 5.586E+00 | 2.484E+00               | 2.484E+00              | 39.67             |
|         | 143.76 | ----- | 10.96*  | 6.189E+00 | -----                   | Line Not Found         | -----             |
|         | 163.33 | ----- | 5.08    | 5.887E+00 | -----                   | Line Not Found         | -----             |
| NP-237  | 185.72 | 133   | 57.20   | 5.487E+00 | 1.254E-01               | 1.254E-01              | 62.56             |
|         | 205.31 | ----- | 5.01    | 5.150E+00 | -----                   | Line Not Found         | -----             |
|         | 86.48  | 252   | 12.40*  | 5.214E+00 | 1.151E+00               | 1.151E+00              | 39.64             |
|         | 95.86  | ----- | 2.68    | 5.757E+00 | -----                   | Line Not Found         | -----             |
| ANH-511 | 511.00 | 175   | 100.00* | 2.547E+00 | 2.026E-01               | 2.026E-01              | 32.10             |

Flag: "\*" = Keyline



Summary of Nuclide Activity  
Sample ID : G1202054949

Page : 3  
Acquisition date : 11-MAR-2010 19:27:29

Total number of lines in spectrum 29  
Number of unidentified lines 5  
Number of lines tentatively identified by NID 24 82.76%

Nuclide Type :

| Nuclide | Hlife     | Decay | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|-------|-------------------------|------------------------|-----------------------------|-------------------|-------|
| K-40    | 1.25E+09Y | 1.00  | 3.544E+01               | 3.544E+01              | 0.338E+01                   | 9.53              |       |
| CD-109  | 461.40D   | 1.02  | 3.857E+00               | 3.953E+00              | 1.330E+00                   | 33.64             |       |
| SN-126  | 2.30E+05Y | 1.00  | 3.857E-01               | 3.857E-01              | 1.297E-01                   | 33.64             |       |
| CS-135  | 2.30E+06Y | 1.00  | 3.265E-01               | 3.265E-01              | 3.023E-01                   | 92.60             |       |
| TL-208  | 1.41E+10Y | 1.00  | 6.016E-01               | 6.016E-01              | 1.059E-01                   | 17.60             |       |
| BI-211  | 7.04E+08Y | 1.00  | 3.755E+00               | 3.755E+00              | 0.545E+00                   | 14.51             |       |
| PB-212  | 1.41E+10Y | 1.00  | 1.841E+00               | 1.841E+00              | 0.183E+00                   | 9.94              |       |
| BI-214  | 1600.00Y  | 1.00  | 1.247E+00               | 1.247E+00              | 0.228E+00                   | 18.27             |       |
| PB-214  | 1600.00Y  | 1.00  | 1.363E+00               | 1.363E+00              | 0.212E+00                   | 15.53             |       |
| RA-224  | 1.41E+10Y | 1.00  | 4.902E+00               | 4.902E+00              | 1.438E+00                   | 29.33             |       |
| RA-226  | 1600.00Y  | 1.00  | 1.247E+00               | 1.247E+00              | 0.228E+00                   | 18.27             |       |
| AC-228  | 1.41E+10Y | 1.00  | 2.217E+00               | 2.217E+00              | 0.450E+00                   | 20.32             |       |
| RA-228  | 1.41E+10Y | 1.00  | 2.217E+00               | 2.217E+00              | 0.450E+00                   | 20.32             |       |
| TH-228  | 1.41E+10Y | 1.00  | 1.841E+00               | 1.841E+00              | 0.183E+00                   | 9.94              |       |
| TH-229  | 7340.00Y  | 1.00  | 4.235E-01               | 4.235E-01              | 1.740E-01                   | 41.09             | K     |
| TH-232  | 1.41E+10Y | 1.00  | 2.217E+00               | 2.217E+00              | 0.450E+00                   | 20.32             |       |
| U-235   | 7.04E+08Y | 1.00  | 1.254E-01               | 1.254E-01              | 0.784E-01                   | 62.56             | K     |
| NP-237  | 2.14E+06Y | 1.00  | 1.151E+00               | 1.151E+00              | 0.456E+00                   | 39.64             |       |
| ANH-511 | 1.00E+09Y | 1.00  | 2.026E-01               | 2.026E-01              | 0.650E-01                   | 32.10             |       |

Total Activity : 6.536E+01 6.546E+01

Grand Total Activity : 6.536E+01 6.546E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : G1202054949

Page : 4  
Acquisition date : 11-MAR-2010 19:27:29

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 128.63  | 140  | 436   | 1.25 | 257.26  | 252  | 11 | 1.94E-02 | 60.2 | 6.33E+00 |       |
| 0  | 208.83  | 94   | 346   | 1.07 | 417.66  | 414  | 10 | 1.30E-02 | 77.3 | 5.09E+00 |       |
| 0  | 726.01  | 99   | 91    | 1.72 | 1452.03 | 1444 | 17 | 1.38E-02 | 48.0 | 1.88E+00 | T     |
| 0  | 768.68  | 96   | 118   | 4.85 | 1537.36 | 1527 | 25 | 1.33E-02 | 64.4 | 1.78E+00 |       |
| 0  | 793.86  | 38   | 59    | 1.82 | 1587.72 | 1583 | 10 | 5.32E-03 | 82.1 | 1.73E+00 |       |
| 1  | 963.81  | 58   | 35    | 2.12 | 1927.61 | 1921 | 23 | 8.08E-03 | 50.3 | 1.45E+00 | T     |
| 0  | 1508.66 | 17   | 11    | 2.80 | 3017.33 | 3009 | 12 | 2.30E-03 | 96.6 | 9.72E-01 |       |

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC
*                                     2040 Savage Road
*                                     Charleston, SC 29414
*****
*
*                               DETECTOR DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054949.CNF;1
* Acquisition date   : 11-MAR-2010 19:27:29   Detector SN#      :
* Detector ID        : GAM23                   Sensitivity       : 5.00000
* Geometry           : CAN                     Energy tolerance  : 1.80000
* Elapsed live time  : 0 02:00:00.00           Abundance limit   : 75.00000
* Elapsed real time  : 0 02:00:01.81           Half life ratio   : 8.00000
*****
*
*                               SAMPLE DATA
*
* Sample date        : 23-FEB-2010 12:00:00   Nuclide Library   : SOLID
* Sample ID          : G1202054949           Analyst initials  : MXR1
* Batch Number       : 958216                Sample Quantity   : 1.26980E+02 GRAM
*****
*
*                               QC DATA
*
* CALIB. DATE/TIME   : 2-JUN-2009 11:17:00.62MS Isotope      :
* MSD ID              :                      MSD Isotope      :
* LCS ID              : 1032-A               LCS Isotope        :
*****

```

## Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| K-40    | 3.544E+01              | 3.379E+00 | 6.287E-01         | 4.703E-02 | 56.373  |
| CD-109  | 3.953E+00              | 1.330E+00 | 1.395E+00         | 1.362E-01 | 2.834   |
| SN-126  | 3.857E-01              | 1.297E-01 | 1.369E-01         | 1.332E-02 | 2.817   |
| CS-135  | 3.265E-01              | 3.023E-01 | 2.851E-01         | 2.178E-02 | 1.145   |
| TL-208  | 6.016E-01              | 1.059E-01 | 6.505E-02         | 4.213E-03 | 9.248   |
| BI-211  | 3.755E+00              | 5.450E-01 | 3.993E-01         | 2.602E-02 | 9.403   |
| PB-212  | 1.841E+00              | 1.829E-01 | 1.048E-01         | 7.600E-03 | 17.569  |
| BI-214  | 1.247E+00              | 2.277E-01 | 1.373E-01         | 1.041E-02 | 9.078   |
| PB-214  | 1.363E+00              | 2.116E-01 | 1.425E-01         | 1.217E-02 | 9.563   |
| RA-224  | 4.902E+00              | 1.438E+00 | 1.123E+00         | 6.327E-02 | 4.365   |
| RA-226  | 1.247E+00              | 2.277E-01 | 1.373E-01         | 1.041E-02 | 9.078   |
| AC-228  | 2.217E+00              | 4.503E-01 | 2.770E-01         | 3.290E-02 | 8.003   |
| RA-228  | 2.217E+00              | 4.503E-01 | 2.770E-01         | 3.290E-02 | 8.003   |
| TH-228  | 1.841E+00              | 1.829E-01 | 1.048E-01         | 7.600E-03 | 17.569  |
| TH-229  | 4.235E-01              | 1.740E-01 | 1.028E+00         | 5.442E-02 | 0.412   |
| TH-232  | 2.217E+00              | 4.503E-01 | 2.770E-01         | 3.290E-02 | 8.003   |
| U-235   | 1.254E-01              | 7.843E-02 | 3.938E-01         | 6.132E-02 | 0.318   |
| NP-237  | 1.151E+00              | 4.562E-01 | 4.147E-01         | 9.570E-02 | 2.775   |

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| ANH-511 | 2.026E-01              | 6.503E-02 | 5.286E-02         | 3.070E-03 | 3.833   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | 8.886E-02                          |              | 3.783E-01 | 6.329E-01           | 4.299E-02 | 0.140   |
| NA-22   | -3.138E-02                         |              | 5.893E-02 | 9.102E-02           | 6.113E-03 | -0.345  |
| NA-24   | -1.217E+00                         |              | 1.628E+00 | Half-Life too short |           |         |
| SC-46   | 1.969E-02                          |              | 4.714E-02 | 8.130E-02           | 7.264E-03 | 0.242   |
| V-48    | 8.106E-03                          |              | 9.219E-02 | 1.539E-01           | 1.280E-02 | 0.053   |
| CR-51   | -2.642E-01                         |              | 4.366E-01 | 7.086E-01           | 4.640E-02 | -0.373  |
| MN-54   | 8.766E-03                          |              | 4.920E-02 | 8.328E-02           | 6.595E-03 | 0.105   |
| CO-56   | 1.200E-02                          |              | 4.931E-02 | 8.396E-02           | 6.831E-03 | 0.143   |
| CO-57   | 6.173E-03                          |              | 3.132E-02 | 5.016E-02           | 2.957E-03 | 0.123   |
| CO-58   | -2.450E-02                         |              | 4.890E-02 | 7.857E-02           | 5.903E-03 | -0.312  |
| FE-59   | 8.418E-02                          |              | 1.155E-01 | 2.020E-01           | 1.555E-02 | 0.417   |
| CO-60   | 8.448E-03                          |              | 4.611E-02 | 7.662E-02           | 5.625E-03 | 0.110   |
| ZN-65   | 1.406E-01                          |              | 1.486E-01 | 2.304E-01           | 1.522E-02 | 0.610   |
| SE-75   | -2.407E-02                         |              | 6.318E-02 | 8.552E-02           | 4.980E-03 | -0.281  |
| SR-85   | 5.684E-03                          |              | 4.758E-02 | 6.840E-02           | 3.969E-03 | 0.083   |
| Y-88    | 4.789E-03                          |              | 4.128E-02 | 6.965E-02           | 4.101E-03 | 0.069   |
| Y-91    | 9.403E+00                          |              | 2.916E+01 | 4.893E+01           | 2.918E+00 | 0.192   |
| NB-94   | 1.695E-02                          |              | 4.345E-02 | 7.212E-02           | 4.121E-03 | 0.235   |
| NB-95   | 9.354E-02                          |              | 6.203E-02 | 9.928E-02           | 6.672E-03 | 0.942   |
| NB-95M  | 9.260E-01                          |              | 2.024E-01 | 3.317E-01           | 2.456E-02 | 2.791   |
| ZR-95   | 7.818E-02                          |              | 9.204E-02 | 1.579E-01           | 1.218E-02 | 0.495   |
| MO-99   | -1.310E+00                         |              | 2.123E+01 | 3.397E+01           | 4.965E+00 | -0.039  |
| TC-99M  | -9.516E+11                         |              | 6.466E+11 | Half-Life too short |           |         |
| RU-103  | 2.332E-02                          |              | 4.749E-02 | 8.056E-02           | 1.002E-02 | 0.289   |
| RH-106  | 1.100E-01                          |              | 3.823E-01 | 6.344E-01           | 7.241E-02 | 0.173   |
| RU-106  | 1.100E-01                          |              | 3.821E-01 | 6.344E-01           | 3.409E-02 | 0.173   |
| AG-108M | -1.880E-02                         |              | 3.291E-02 | 5.230E-02           | 3.269E-03 | -0.359  |
| AG-110M | -1.489E-02                         |              | 4.306E-02 | 6.778E-02           | 3.767E-03 | -0.220  |
| SN-113  | -1.385E-03                         |              | 5.410E-02 | 8.979E-02           | 5.531E-03 | -0.015  |
| CD-115  | -1.889E+00                         |              | 1.988E+01 | 3.236E+01           | 1.867E+00 | -0.058  |
| SN-117M | 6.137E-02                          |              | 6.936E-02 | 1.168E-01           | 6.072E-03 | 0.525   |
| TE-123M | 3.718E-02                          |              | 3.391E-02 | 5.755E-02           | 3.037E-03 | 0.646   |
| SB-124  | 4.776E-02                          |              | 8.280E-02 | 1.521E-01           | 1.064E-02 | 0.314   |
| SB-125  | -6.821E-02                         |              | 1.008E-01 | 1.591E-01           | 9.664E-03 | -0.429  |
| TE-125M | -1.009E+01                         |              | 1.196E+01 | 1.907E+01           | 1.735E+00 | -0.529  |
| I-126   | -2.546E-02                         |              | 2.960E-01 | 4.758E-01           | 2.462E-02 | -0.054  |
| SB-126  | 2.873E-02                          |              | 2.180E-01 | 3.073E-01           | 1.842E-02 | 0.093   |
| SB-127  | -8.091E-01                         |              | 1.970E+00 | 3.068E+00           | 2.958E-01 | -0.264  |
| I-131   | 1.399E-01                          |              | 1.445E-01 | 2.537E-01           | 1.660E-02 | 0.552   |
| TE-132  | -8.840E-01                         |              | 1.150E+00 | 1.771E+00           | 2.593E-01 | -0.499  |
| BA-133  | 2.934E-02                          |              | 5.525E-02 | 8.337E-02           | 9.437E-03 | 0.352   |
| I-133   | 5.876E-04                          |              | 9.577E-03 | Half-Life too short |           |         |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| CS-134  | 9.409E-02                          |              | 5.968E-02 | 1.008E-01           | 7.365E-03 | 0.933   |
| I-135   | -2.565E+10                         |              | 8.359E+10 | Half-Life too short |           |         |
| CS-136  | -5.598E-02                         |              | 1.436E-01 | 2.283E-01           | 1.819E-02 | -0.245  |
| BA-137M | 2.276E-02                          |              | 4.366E-02 | 7.349E-02           | 3.754E-03 | 0.310   |
| CS-137  | 2.405E-02                          |              | 4.613E-02 | 7.764E-02           | 3.988E-03 | 0.310   |
| CE-139  | 3.284E-03                          |              | 3.477E-02 | 5.683E-02           | 2.897E-03 | 0.058   |
| BA-140  | -2.879E-01                         |              | 3.633E-01 | 5.395E-01           | 1.797E-01 | -0.534  |
| LA-140  | -7.408E-02                         |              | 1.050E-01 | 1.561E-01           | 1.071E-02 | -0.475  |
| CE-141  | -1.702E-02                         |              | 7.658E-02 | 1.231E-01           | 6.945E-03 | -0.138  |
| CE-143  | 2.049E-03                          | +            | 3.231E-04 | Half-Life too short |           |         |
| CE-144  | -1.026E-01                         |              | 2.760E-01 | 3.885E-01           | 5.366E-02 | -0.264  |
| PM-144  | -2.513E-02                         |              | 4.811E-02 | 7.471E-02           | 4.203E-03 | -0.336  |
| PR-144  | -1.863E+00                         |              | 3.604E+00 | 5.599E+00           | 3.147E-01 | -0.333  |
| PM-146  | 6.624E-03                          |              | 5.076E-02 | 8.448E-02           | 7.177E-03 | 0.078   |
| ND-147  | 1.506E-01                          |              | 7.571E-01 | 1.256E+00           | 1.697E-01 | 0.120   |
| PM-149  | 1.126E+01                          |              | 1.560E+02 | 2.637E+02           | 3.743E+01 | 0.043   |
| EU-152  | -8.902E-02                         |              | 1.398E-01 | 1.810E-01           | 1.199E-02 | -0.492  |
| GD-153  | -4.912E-02                         |              | 1.128E-01 | 1.590E-01           | 1.299E-02 | -0.309  |
| EU-154  | -9.341E-02                         |              | 1.666E-01 | 2.563E-01           | 2.564E-02 | -0.364  |
| EU-155  | 1.877E-01                          |              | 1.314E-01 | 2.264E-01           | 1.668E-02 | 0.829   |
| TB-160  | 6.756E-02                          |              | 1.731E-01 | 2.977E-01           | 2.604E-02 | 0.227   |
| HO-166M | 2.749E-02                          |              | 7.284E-02 | 1.211E-01           | 7.087E-03 | 0.227   |
| TA-182  | 1.359E-01                          |              | 2.784E-01 | 4.715E-01           | 2.894E-02 | 0.288   |
| IR-192  | -1.762E-02                         |              | 3.946E-02 | 6.463E-02           | 3.834E-03 | -0.273  |
| HG-203  | 2.138E-02                          |              | 4.506E-02 | 7.756E-02           | 4.764E-03 | 0.276   |
| BI-207  | 3.940E-02                          |              | 6.297E-02 | 1.097E-01           | 8.056E-03 | 0.359   |
| PB-210  | -8.187E-02                         |              | 6.107E+00 | 1.015E+01           | 7.844E-01 | -0.008  |
| PB-211  | -5.618E-01                         |              | 9.090E-01 | 1.387E+00           | 6.655E-01 | -0.405  |
| BI-212  | 2.344E+00                          | +            | 1.154E+00 | 1.298E+00           | 1.411E-01 | 1.806   |
| RN-219  | -5.948E-02                         |              | 4.914E-01 | 8.101E-01           | 1.088E-01 | -0.073  |
| RA-223  | -7.438E-01                         |              | 7.933E-01 | 1.254E+00           | 2.026E-01 | -0.593  |
| AC-227  | -8.060E-02                         |              | 2.981E-01 | 4.701E-01           | 4.786E-02 | -0.171  |
| TH-227  | -8.060E-02                         |              | 2.982E-01 | 4.701E-01           | 5.632E-02 | -0.171  |
| PA-231  | 5.586E-01                          |              | 1.662E+00 | 2.843E+00           | 3.733E-01 | 0.197   |
| TH-231  | -7.438E-01                         |              | 7.933E-01 | 1.254E+00           | 2.026E-01 | -0.593  |
| PA-233  | 3.379E-02                          |              | 7.323E-02 | 1.258E-01           | 7.864E-03 | 0.269   |
| PA-234  | 4.329E-01                          |              | 3.812E-01 | 6.774E-01           | 1.273E-01 | 0.639   |
| PA-234M | -3.310E-01                         |              | 5.517E+00 | 9.080E+00           | 8.664E-01 | -0.036  |
| TH-234  | 2.302E+00                          |              | 1.924E+00 | 3.256E+00           | 5.989E-01 | 0.707   |
| U-238   | 2.302E+00                          |              | 1.924E+00 | 3.256E+00           | 5.989E-01 | 0.707   |
| NP-239  | -2.106E-02                         |              | 4.953E-01 | 7.988E-01           | 4.972E-02 | -0.026  |
| AM-241  | -3.284E-01                         |              | 2.275E-01 | 3.596E-01           | 3.346E-02 | -0.913  |
| CM-247  | 1.937E-02                          |              | 4.451E-02 | 7.569E-02           | 4.387E-03 | 0.256   |
| CF-249  | -7.672E-04                         |              | 4.692E-02 | 7.796E-02           | 4.510E-03 | -0.010  |
| CF-251  | 2.473E-02                          |              | 1.538E-01 | 2.513E-01           | 1.301E-02 | 0.098   |

# VAX/VMS Nuclide Identification Report Generated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : SYS$SYSROOT:[ALPHA.ARCHIVE.GAMMA]G1202054949          *
* Acquisition date   : 11-MAR-2010 19:27:29 Detector SN#      :              *
* Detector ID        : GAM23                                           Sensitivity      : 5.000          *
* Geometry           : CAN                                           Energy tolerance : 1.800          *
* Elapsed live time  : 0 02:00:00.00                               Abundance limit  : 75.000         *
* Elapsed real time  : 0 02:00:01.81                               Half life ratio  : 8.000          *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date        : 23-FEB-2010 12:00:00 Nuclide Library : SOLID          *
* Sample ID          : G1202054949                               Analyst initials: MXR1           *
* Batch Number       : 958216                                     Sample Quantity : 1.2698E+02 GRAM  *
* Recovery           : 1.00000                                    Carrier Weight  : 0.00000         *
*****
*
*                                     QC DATA                               *
*
* CALIB. DATE/TIME  : 2-JUN-2009 11:17:00 MS Isotope           :              *
* MSD DPM           : 0.000                                         MSD Isotope      :              *
* LCS DPM           : 0.000                                         LCS Isotope      :              *
* LCSD DPM          : 0.000                                         LCSD Isotope     :              *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act Error | DLC<br>(pCi/GRAM ) | TPU       |
|---------|-------------------------|-----------|--------------------|-----------|
| K-40    | 3.544E+01               | 3.312E+00 | 3.145E-01          | 1.690E+00 |
| CD-109  | 3.953E+00               | 1.303E+00 | 7.270E-01          | 6.649E-01 |
| SN-126  | 3.857E-01               | 1.272E-01 | 7.137E-02          | 6.487E-02 |
| CS-135  | 3.265E-01               | 2.963E-01 | 1.463E-01          | 1.512E-01 |
| TL-208  | 6.016E-01               | 1.038E-01 | 3.299E-02          | 5.294E-02 |
| BI-211  | 3.755E+00               | 5.341E-01 | 2.040E-01          | 2.725E-01 |
| PB-212  | 1.841E+00               | 1.792E-01 | 5.383E-02          | 9.145E-02 |
| BI-214  | 1.247E+00               | 2.232E-01 | 6.960E-02          | 1.139E-01 |
| PB-214  | 1.363E+00               | 2.074E-01 | 7.281E-02          | 1.058E-01 |
| RA-224  | 4.902E+00               | 1.409E+00 | 5.770E-01          | 7.189E-01 |
| RA-226  | 1.247E+00               | 2.232E-01 | 6.960E-02          | 1.139E-01 |
| AC-228  | 2.217E+00               | 4.413E-01 | 1.395E-01          | 2.252E-01 |
| RA-228  | 2.217E+00               | 4.413E-01 | 1.395E-01          | 2.252E-01 |
| TH-228  | 1.841E+00               | 1.792E-01 | 5.383E-02          | 9.145E-02 |
| TH-229  | 5.579E-01               | 5.994E-01 | 5.296E-01          | 3.058E-01 |
| TH-232  | 2.217E+00               | 4.413E-01 | 1.395E-01          | 2.252E-01 |
| U-235   | 1.400E-01               | 2.337E-01 | 2.038E-01          | 1.192E-01 |
| NP-237  | 1.151E+00               | 4.471E-01 | 2.162E-01          | 2.281E-01 |
| ANH-511 | 2.026E-01               | 6.373E-02 | 2.686E-02          | 3.251E-02 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act error | DLC<br>(pCi/GRAM ) | TPU                  |
|---------|-------------------------------------|---------------|--------------------|----------------------|
| BE-7    | 8.886E-02                           | 3.708E-01     | 3.219E-01          | 1.892E-01 NOT IDENT. |
| NA-22   | -3.138E-02                          | 5.775E-02     | 4.562E-02          | 2.946E-02 NOT IDENT. |
| NA-24   | -1.217E+06                          | 3.191E+06     | 0.000E+00          | 1.628E+06 SHORT HLIF |
| SC-46   | 1.969E-02                           | 4.620E-02     | 4.097E-02          | 2.357E-02 FAIL ABUN  |
| V-48    | 8.106E-03                           | 9.034E-02     | 7.743E-02          | 4.609E-02 NOT IDENT. |
| CR-51   | -2.642E-01                          | 4.279E-01     | 3.626E-01          | 2.183E-01 NOT IDENT. |
| MN-54   | 8.766E-03                           | 4.822E-02     | 4.201E-02          | 2.460E-02 NOT IDENT. |
| CO-56   | 1.200E-02                           | 4.833E-02     | 4.234E-02          | 2.466E-02 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| CO-57   | 6.173E-03  | 3.069E-02 | 2.603E-02 | 1.566E-02 | NOT IDENT. |
| CO-58   | -2.450E-02 | 4.792E-02 | 3.965E-02 | 2.445E-02 | NOT IDENT. |
| FE-59   | 8.418E-02  | 1.132E-01 | 1.015E-01 | 5.776E-02 | NOT IDENT. |
| CO-60   | 8.448E-03  | 4.519E-02 | 3.838E-02 | 2.306E-02 | NOT IDENT. |
| ZN-65   | 1.406E-01  | 1.456E-01 | 1.157E-01 | 7.430E-02 | NOT IDENT. |
| SE-75   | -2.407E-02 | 6.192E-02 | 4.388E-02 | 3.159E-02 | NOT IDENT. |
| SR-85   | 5.684E-03  | 4.663E-02 | 3.475E-02 | 2.379E-02 | NOT IDENT. |
| Y-88    | 4.789E-03  | 4.045E-02 | 3.471E-02 | 2.064E-02 | NOT IDENT. |
| Y-91    | 9.403E+00  | 2.857E+01 | 2.454E+01 | 1.458E+01 | NOT IDENT. |
| NB-94   | 1.695E-02  | 4.258E-02 | 3.647E-02 | 2.172E-02 | NOT IDENT. |
| NB-95   | 9.354E-02  | 6.079E-02 | 5.015E-02 | 3.102E-02 | NOT IDENT. |
| NB-95M  | 9.260E-01  | 1.984E-01 | 1.705E-01 | 1.012E-01 | NOT IDENT. |
| ZR-95   | 7.818E-02  | 9.020E-02 | 7.977E-02 | 4.602E-02 | NOT IDENT. |
| MO-99   | -1.310E+00 | 2.081E+01 | 1.717E+01 | 1.062E+01 | NOT IDENT. |
| TC-99M  | -9.516E+17 | 1.267E+18 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | 2.332E-02  | 4.654E-02 | 4.095E-02 | 2.375E-02 | FAIL ABUN  |
| RH-106  | 1.100E-01  | 3.746E-01 | 3.214E-01 | 1.911E-01 | NOT IDENT. |
| RU-106  | 1.100E-01  | 3.745E-01 | 3.214E-01 | 1.911E-01 | NOT IDENT. |
| AG-108M | -1.880E-02 | 3.225E-02 | 2.664E-02 | 1.646E-02 | NOT IDENT. |
| AG-110M | -1.489E-02 | 4.220E-02 | 3.432E-02 | 2.153E-02 | NOT IDENT. |
| SN-113  | -1.385E-03 | 5.301E-02 | 4.581E-02 | 2.705E-02 | NOT IDENT. |
| CD-115  | -1.889E+00 | 1.949E+01 | 1.643E+01 | 9.942E+00 | NOT IDENT. |
| SN-117M | 6.137E-02  | 6.798E-02 | 6.040E-02 | 3.468E-02 | NOT IDENT. |
| TE-123M | 3.718E-02  | 3.323E-02 | 2.975E-02 | 1.696E-02 | NOT IDENT. |
| SB-124  | 4.776E-02  | 8.114E-02 | 7.589E-02 | 4.140E-02 | NOT IDENT. |
| SB-125  | -6.821E-02 | 9.875E-02 | 8.104E-02 | 5.038E-02 | NOT IDENT. |
| TE-125M | -1.009E+01 | 1.172E+01 | 9.909E+00 | 5.978E+00 | NOT IDENT. |
| I-126   | -2.546E-02 | 2.901E-01 | 2.408E-01 | 1.480E-01 | NOT IDENT. |
| SB-126  | 2.873E-02  | 2.136E-01 | 1.554E-01 | 1.090E-01 | NOT IDENT. |
| SB-127  | -8.091E-01 | 1.930E+00 | 1.552E+00 | 9.849E-01 | NOT IDENT. |
| I-131   | 1.399E-01  | 1.416E-01 | 1.296E-01 | 7.225E-02 | NOT IDENT. |
| TE-132  | -8.840E-01 | 1.127E+00 | 9.106E-01 | 5.750E-01 | NOT IDENT. |
| BA-133  | 2.934E-02  | 5.415E-02 | 4.259E-02 | 2.763E-02 | NOT IDENT. |
| I-133   | 5.876E+02  | 1.877E+04 | 0.000E+00 | 9.577E+03 | SHORT HLIF |
| CS-134  | 9.409E-02  | 5.848E-02 | 5.090E-02 | 2.984E-02 | NOT IDENT. |
| I-135   | -2.565E+16 | 1.638E+17 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -5.598E-02 | 1.407E-01 | 1.148E-01 | 7.178E-02 | NOT IDENT. |
| BA-137M | 2.276E-02  | 4.279E-02 | 3.720E-02 | 2.183E-02 | NOT IDENT. |
| CS-137  | 2.405E-02  | 4.520E-02 | 3.930E-02 | 2.306E-02 | NOT IDENT. |
| CE-139  | 3.284E-03  | 3.408E-02 | 2.936E-02 | 1.739E-02 | NOT IDENT. |
| BA-140  | -2.879E-01 | 3.560E-01 | 2.740E-01 | 1.816E-01 | NOT IDENT. |
| LA-140  | -7.408E-02 | 1.029E-01 | 7.795E-02 | 5.252E-02 | NOT IDENT. |
| CE-141  | -1.702E-02 | 7.505E-02 | 6.373E-02 | 3.829E-02 | NOT IDENT. |
| CE-143  | 2.049E+03  | 6.333E+02 | 0.000E+00 | 3.231E+02 | SHORT HLIF |
| CE-144  | -1.026E-01 | 2.705E-01 | 2.013E-01 | 1.380E-01 | NOT IDENT. |
| PM-144  | -2.513E-02 | 4.715E-02 | 3.779E-02 | 2.405E-02 | NOT IDENT. |
| PR-144  | -1.863E+00 | 3.532E+00 | 2.832E+00 | 1.802E+00 | NOT IDENT. |
| PM-146  | 6.624E-03  | 4.974E-02 | 4.300E-02 | 2.538E-02 | NOT IDENT. |
| ND-147  | 1.506E-01  | 7.419E-01 | 6.381E-01 | 3.785E-01 | FAIL ABUN  |
| PM-149  | 1.126E+01  | 1.529E+02 | 1.351E+02 | 7.800E+01 | NOT IDENT. |
| EU-152  | -8.902E-02 | 1.370E-01 | 9.253E-02 | 6.989E-02 | FAIL ABUN  |
| GD-153  | -4.912E-02 | 1.105E-01 | 8.276E-02 | 5.639E-02 | NOT IDENT. |
| EU-154  | -9.341E-02 | 1.633E-01 | 1.285E-01 | 8.329E-02 | NOT IDENT. |
| EU-155  | 1.877E-01  | 1.288E-01 | 1.177E-01 | 6.571E-02 | FAIL ABUN  |
| TB-160  | 6.756E-02  | 1.696E-01 | 1.501E-01 | 8.655E-02 | FAIL ABUN  |
| HO-166M | 2.749E-02  | 7.138E-02 | 6.123E-02 | 3.642E-02 | FAIL ABUN  |
| TA-182  | 1.359E-01  | 2.729E-01 | 2.365E-01 | 1.392E-01 | FAIL ABUN  |
| IR-192  | -1.762E-02 | 3.867E-02 | 3.307E-02 | 1.973E-02 | FAIL ABUN  |
| HG-203  | 2.138E-02  | 4.416E-02 | 3.976E-02 | 2.253E-02 | FAIL ABUN  |
| BI-207  | 3.940E-02  | 6.171E-02 | 5.511E-02 | 3.148E-02 | FAIL ABUN  |
| PB-210  | -8.187E-02 | 5.985E+00 | 5.341E+00 | 3.053E+00 | NOT IDENT. |
| PB-211  | -5.618E-01 | 8.908E-01 | 7.074E-01 | 4.545E-01 | NOT IDENT. |
| BI-212  | 2.344E+00  | 1.131E+00 | 6.561E-01 | 5.771E-01 | FAIL ABUN  |
| RN-219  | -5.948E-02 | 4.815E-01 | 4.131E-01 | 2.457E-01 | NOT IDENT. |
| RA-223  | -7.438E-01 | 7.775E-01 | 6.414E-01 | 3.967E-01 | FAIL ABUN  |
| AC-227  | -8.060E-02 | 2.922E-01 | 2.413E-01 | 1.491E-01 | FAIL ABUN  |
| TH-227  | -8.060E-02 | 2.922E-01 | 2.413E-01 | 1.491E-01 | FAIL ABUN  |
| PA-231  | 5.586E-01  | 1.629E+00 | 1.457E+00 | 8.312E-01 | FAIL ABUN  |
| TH-231  | -7.438E-01 | 7.775E-01 | 6.414E-01 | 3.967E-01 | FAIL ABUN  |
| PA-233  | 3.379E-02  | 7.177E-02 | 6.437E-02 | 3.662E-02 | FAIL ABUN  |
| PA-234  | 4.329E-01  | 3.735E-01 | 3.411E-01 | 1.906E-01 | NOT IDENT. |
| PA-234M | -3.310E-01 | 5.407E+00 | 4.568E+00 | 2.759E+00 | NOT IDENT. |
| TH-234  | 2.302E+00  | 1.885E+00 | 1.705E+00 | 9.619E-01 | FAIL ABUN  |
| U-238   | 2.302E+00  | 1.885E+00 | 1.705E+00 | 9.619E-01 | FAIL ABUN  |
| NP-239  | -2.106E-02 | 4.854E-01 | 4.147E-01 | 2.477E-01 | NOT IDENT. |
| AM-241  | -3.284E-01 | 2.229E-01 | 1.885E-01 | 1.137E-01 | NOT IDENT. |
| CM-247  | 1.937E-02  | 4.362E-02 | 3.860E-02 | 2.225E-02 | NOT IDENT. |
| CF-249  | -7.672E-04 | 4.598E-02 | 3.978E-02 | 2.346E-02 | NOT IDENT. |

|        |           |           |           |                      |
|--------|-----------|-----------|-----------|----------------------|
| CF-251 | 2.473E-02 | 1.507E-01 | 1.297E-01 | 7.688E-02 NOT IDENT. |
|--------|-----------|-----------|-----------|----------------------|



\*\*\*\*\*  
 \* GEL Laboratories LLC \*  
 \* 2040 SAVAGE ROAD \*  
 \* CHARLESTON ,SC 29417 \*  
 \* GAMMA SPECTROSCOPY BACKGROUND REPORT \*  
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| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 334.2935   |
| 49.72  | 343.4709   |
| 57.36  | 0.0000     |
| 59.54  | 464.5781   |
| 63.29  | 406.9011   |
| 63.29  | 406.9011   |
| 64.28  | 400.9995   |
| 67.75  | 441.4125   |
| 69.67  | 453.1493   |
| 70.83  | 449.3906   |
| 72.81  | 494.3563   |
| 72.87  | 494.3983   |
| 72.87  | 494.3983   |
| 74.82  | 471.3664   |
| 74.82  | 471.3664   |
| 74.82  | 471.3664   |
| 74.97  | 471.4635   |
| 77.11  | 442.7086   |
| 77.11  | 442.7086   |
| 77.11  | 442.7086   |
| 79.69  | 418.3763   |
| 79.80  | 418.4367   |
| 80.12  | 452.8650   |
| 80.19  | 452.9067   |
| 80.57  | 453.1337   |
| 81.00  | 380.9998   |
| 81.07  | 381.0349   |
| 81.07  | 381.0349   |
| 83.79  | 372.8241   |
| 83.79  | 372.8241   |
| 85.43  | 373.6052   |
| 86.48  | 374.1021   |
| 86.55  | 374.1363   |
| 86.79  | 374.2479   |
| 86.94  | 374.3193   |
| 87.57  | 374.6154   |
| 88.03  | 374.8311   |
| 88.47  | 375.0364   |
| 89.96  | 375.7282   |
| 91.11  | 376.2593   |
| 92.59  | 376.9362   |
| 92.59  | 376.9362   |
| 93.35  | 377.2829   |
| 94.67  | 336.4096   |
| 94.87  | 358.1995   |
| 94.87  | 358.1995   |
| 95.86  | 395.8803   |
| 97.43  | 365.5065   |
| 98.44  | 330.1230   |
| 99.53  | 332.6198   |
| 100.11 | 348.8159   |
| 103.18 | 427.6263   |
| 103.37 | 407.1641   |
| 105.31 | 363.9124   |
| 106.12 | 371.1132   |
| 109.28 | 410.8311   |
| 111.00 | 376.0672   |
| 111.76 | 395.1447   |
| 116.30 | 355.3670   |
| 117.23 | 367.6373   |
| 121.12 | 339.1920   |
| 121.78 | 349.1180   |
| 122.06 | 349.2180   |
| 123.07 | 334.2686   |
| 131.20 | 345.0436   |
| 133.52 | 382.9870   |
| 136.00 | 380.6587   |

|        |          |
|--------|----------|
| 136.47 | 368.6766 |
| 140.51 | 412.7836 |
| 140.51 | 0.0000   |
| 143.76 | 333.4666 |
| 144.24 | 346.8767 |
| 144.24 | 346.8767 |
| 145.44 | 354.4074 |
| 152.43 | 329.9218 |
| 153.25 | 342.5018 |
| 154.21 | 343.8208 |
| 154.21 | 343.8208 |
| 156.02 | 391.7967 |
| 158.56 | 316.1975 |
| 159.00 | 305.9794 |
| 162.66 | 355.6788 |
| 163.33 | 354.8427 |
| 165.86 | 311.9316 |
| 176.60 | 312.6031 |
| 177.52 | 309.6856 |
| 181.07 | 330.1471 |
| 184.41 | 314.1293 |
| 185.72 | 282.1190 |
| 193.51 | 266.8120 |
| 197.04 | 319.7502 |
| 205.31 | 308.8499 |
| 210.85 | 277.3614 |
| 215.65 | 270.4121 |
| 222.11 | 285.4410 |
| 227.38 | 270.1412 |
| 228.16 | 283.3633 |
| 228.18 | 283.3673 |
| 235.69 | 245.3743 |
| 235.96 | 254.1837 |
| 235.96 | 254.1837 |
| 238.63 | 237.0756 |
| 238.63 | 237.0756 |
| 240.99 | 237.4464 |
| 242.00 | 214.7242 |
| 244.70 | 195.7093 |
| 252.40 | 219.2771 |
| 252.80 | 188.3162 |
| 256.23 | 215.3719 |
| 256.23 | 215.3719 |
| 260.90 | 197.0778 |
| 264.66 | 223.2086 |
| 268.22 | 198.6442 |
| 269.46 | 212.6744 |
| 269.46 | 212.6744 |
| 271.23 | 227.6977 |
| 273.65 | 271.1254 |
| 276.40 | 206.8287 |
| 277.37 | 202.4506 |
| 277.60 | 194.6039 |
| 278.00 | 198.0269 |
| 279.20 | 201.7723 |
| 279.54 | 204.5161 |
| 280.46 | 219.9515 |
| 283.69 | 191.4729 |
| 284.31 | 203.2883 |
| 285.41 | 208.8447 |
| 285.90 | 201.6718 |
| 287.50 | 193.4865 |
| 293.27 | 0.0000   |
| 295.22 | 209.1338 |
| 295.96 | 209.2236 |
| 298.57 | 209.5353 |
| 299.98 | 170.1943 |
| 299.98 | 170.1943 |
| 300.09 | 170.2057 |
| 300.09 | 170.2057 |
| 300.13 | 170.2103 |
| 301.36 | 187.0575 |
| 302.85 | 185.6931 |
| 304.50 | 184.3433 |
| 304.50 | 184.3433 |
| 304.85 | 184.3802 |
| 308.46 | 188.7244 |
| 311.90 | 160.6317 |

|        |          |
|--------|----------|
| 316.51 | 171.1622 |
| 319.41 | 166.8262 |
| 320.08 | 179.7966 |
| 323.87 | 215.2775 |
| 323.87 | 215.2775 |
| 328.76 | 173.2307 |
| 333.37 | 134.6542 |
| 334.37 | 147.1135 |
| 334.37 | 147.1135 |
| 338.28 | 169.4542 |
| 338.28 | 169.4542 |
| 338.32 | 169.4564 |
| 338.32 | 169.4564 |
| 338.32 | 169.4564 |
| 340.48 | 152.2497 |
| 340.55 | 152.2557 |
| 344.28 | 177.4570 |
| 351.06 | 167.1440 |
| 351.93 | 160.9668 |
| 356.01 | 142.5096 |
| 364.49 | 118.9002 |
| 366.42 | 154.9071 |
| 383.85 | 140.9939 |
| 388.16 | 142.2393 |
| 388.63 | 136.5430 |
| 391.69 | 148.2169 |
| 400.66 | 145.0057 |
| 401.81 | 148.9264 |
| 402.40 | 135.5128 |
| 404.85 | 159.7203 |
| 410.95 | 111.9275 |
| 414.70 | 118.8860 |
| 423.72 | 112.5803 |
| 427.09 | 113.7222 |
| 427.87 | 120.5685 |
| 433.94 | 116.9956 |
| 453.88 | 119.9850 |
| 463.37 | 122.4455 |
| 468.07 | 115.7632 |
| 473.00 | 113.0287 |
| 476.78 | 102.2821 |
| 477.60 | 102.3173 |
| 487.02 | 95.7340  |
| 492.35 | 121.9270 |
| 497.08 | 94.1239  |
| 511.00 | 95.6546  |
| 514.00 | 99.1286  |
| 527.90 | 100.3438 |
| 529.87 | 0.0000   |
| 531.02 | 104.5239 |
| 537.26 | 115.9622 |
| 546.56 | 0.0000   |
| 563.25 | 90.3934  |
| 569.33 | 98.8313  |
| 569.50 | 98.8383  |
| 569.70 | 102.9639 |
| 583.19 | 83.8101  |
| 600.60 | 81.5558  |
| 602.73 | 88.5631  |
| 604.72 | 99.0496  |
| 609.32 | 99.2096  |
| 609.32 | 99.2096  |
| 610.33 | 88.7976  |
| 614.28 | 92.4071  |
| 618.01 | 89.0363  |
| 621.93 | 83.9121  |
| 621.93 | 83.9121  |
| 633.25 | 86.3422  |
| 635.95 | 85.3684  |
| 636.99 | 81.1809  |
| 645.85 | 78.2510  |
| 657.76 | 92.3632  |
| 661.66 | 81.8520  |
| 661.66 | 81.8520  |
| 664.57 | 0.0000   |
| 666.33 | 94.7537  |
| 666.50 | 90.4993  |
| 677.62 | 81.2102  |

|         |          |
|---------|----------|
| 685.70  | 83.5644  |
| 695.00  | 111.7518 |
| 696.49  | 120.4055 |
| 696.51  | 120.4055 |
| 697.00  | 111.8228 |
| 702.65  | 91.5555  |
| 706.68  | 94.9072  |
| 711.68  | 73.4536  |
| 720.70  | 75.8259  |
| 721.93  | 0.0000   |
| 722.78  | 115.6172 |
| 722.91  | 115.6224 |
| 723.31  | 104.7970 |
| 724.19  | 72.2933  |
| 727.33  | 74.8960  |
| 733.00  | 70.6764  |
| 735.93  | 92.5060  |
| 739.50  | 81.7108  |
| 747.24  | 77.5349  |
| 752.31  | 82.0276  |
| 753.82  | 70.0297  |
| 756.73  | 67.9003  |
| 763.94  | 91.4591  |
| 765.81  | 69.5476  |
| 766.42  | 63.7023  |
| 777.92  | 59.8256  |
| 778.90  | 72.4413  |
| 783.70  | 66.2344  |
| 785.37  | 68.1073  |
| 795.86  | 50.6417  |
| 801.95  | 78.6907  |
| 810.29  | 67.6697  |
| 810.76  | 79.7309  |
| 815.77  | 66.8467  |
| 818.51  | 65.0397  |
| 832.01  | 72.7489  |
| 834.85  | 88.6740  |
| 836.80  | 0.0000   |
| 846.77  | 68.3632  |
| 856.80  | 62.7833  |
| 860.56  | 51.5670  |
| 871.09  | 56.5625  |
| 873.19  | 66.9698  |
| 875.33  | 0.0000   |
| 879.36  | 60.4674  |
| 880.51  | 57.6517  |
| 883.24  | 70.9335  |
| 884.68  | 73.7994  |
| 889.28  | 55.8911  |
| 898.04  | 74.0613  |
| 911.20  | 62.8848  |
| 911.20  | 62.8848  |
| 911.20  | 62.8848  |
| 926.50  | 55.4819  |
| 937.49  | 61.3932  |
| 944.13  | 63.4192  |
| 946.00  | 49.9910  |
| 949.00  | 60.6121  |
| 962.29  | 41.3705  |
| 964.08  | 49.2527  |
| 966.15  | 49.2786  |
| 968.97  | 43.0970  |
| 968.97  | 43.0970  |
| 968.97  | 43.0970  |
| 983.53  | 59.1955  |
| 996.26  | 66.1946  |
| 1001.03 | 61.3991  |
| 1004.73 | 74.1353  |
| 1037.84 | 60.9606  |
| 1038.76 | 0.0000   |
| 1048.07 | 65.0493  |
| 1050.41 | 56.2114  |
| 1050.41 | 56.2114  |
| 1063.66 | 48.4716  |
| 1085.87 | 45.7380  |
| 1099.45 | 51.8625  |
| 1112.07 | 73.3483  |
| 1115.54 | 75.5022  |

|         |          |
|---------|----------|
| 1120.29 | 63.1307  |
| 1120.29 | 63.1307  |
| 1120.55 | 63.1333  |
| 1121.30 | 63.1436  |
| 1131.51 | 0.0000   |
| 1173.23 | 59.8138  |
| 1177.93 | 66.9775  |
| 1189.05 | 62.0524  |
| 1204.77 | 72.4647  |
| 1221.41 | 81.9368  |
| 1231.02 | 112.8914 |
| 1235.36 | 83.2050  |
| 1238.28 | 90.4492  |
| 1260.41 | 0.0000   |
| 1271.85 | 50.7127  |
| 1274.44 | 65.2354  |
| 1274.54 | 65.2379  |
| 1291.59 | 55.0703  |
| 1298.22 | 0.0000   |
| 1312.11 | 34.4301  |
| 1332.49 | 32.4746  |
| 1365.19 | 28.4645  |
| 1368.63 | 0.0000   |
| 1384.29 | 24.3364  |
| 1408.01 | 30.8231  |
| 1457.56 | 0.0000   |
| 1460.82 | 23.6131  |
| 1489.16 | 28.0503  |
| 1505.03 | 14.8376  |
| 1596.21 | 26.3828  |
| 1620.50 | 12.2999  |
| 1678.03 | 0.0000   |
| 1690.97 | 9.5728   |
| 1764.49 | 13.5610  |
| 1764.49 | 13.5610  |
| 1770.23 | 30.0550  |
| 1771.35 | 11.6363  |
| 1791.20 | 0.0000   |
| 1836.06 | 13.7129  |

TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G1202054949

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 6.9130E+00 | ug/g |
| Total Uranium Counting Unc. | 5.6102E+00 | ug/g |
| Total Uranium Tpu           | 2.8623E-06 | ug/g |
| Total Uranium Mda           | 5.0735E+00 | ug/g |

```

*****
*
*               GEL Laboratories LLC                      *
*               2040 SAVAGE ROAD                          *
*               CHARLESTON ,SC 29417                      *
*               GROSS GAMMA REPORT                        *
*
*****
*
*  BATCH ID      : 958216                                SAMPLE ID   : G1202054949
*  ANALYST       : MXR1                                  DETECTOR    : GAM23
*  SAMPLE DATE   : 23-FEB-2010 12:00:00.00              COUNT TIME   : 0 02:00:00.00
*  ANALYSIS DATE : 11-MAR-2010 19:27:29.28              SAMPLE ALQT  : 126.980 GRAM
*
*****

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GROSS GAMMA ACTIVITY (pCi/GRAM ) : 1.045E+01
GROSS GAMMA ERROR   (pCi/GRAM ) : 1.500E+00
GROSS GAMMA MDA      (pCi/GRAM ) : 3.697E+00
GROSS GAMMA DLC      (pCi/GRAM ) : 1.798E+00

```

VAX/VMS Nuclide Identification Report Generated 11-MAR-2010 20:36:11.33

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29414                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054950.CNF;1
Sample date        : 2-MAR-2010 00:00:00. Acquisition date : 11-MAR-2010 19:35:21
Sample ID          : G1202054950          Sample quantity  : 1.55440E+02 GRAM
Detector name      : GAM21                Detector geometry: CAN
Elapsed live time  : 0 01:00:00.00        Elapsed real time: 0 01:00:14.04  0.4%
Energy tolerance   : 1.50000 keV          Analyst Initials : MXR1
Abundance limit    : 75.00000             Sensitivity       : 5.00000
Batch ID           : 958216               Detector SN#      :
Matrix Spike ID    :                     LCS ID           : 1032-A
*****

```

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|------|----|----------|------|----------|
| 1  | 0  | 49.25    | 150  | 999   | 1.33 | 98.48   | 95   | 7  | 4.17E-02 | 35.7 |          |
| 2  | 0  | 59.56    | 8039 | 970   | 0.63 | 119.09  | 115  | 8  | 2.23E+00 | 1.3  |          |
| 3  | 2  | 74.89*   | 226  | 309   | 0.82 | 149.74  | 145  | 14 | 6.28E-02 | 13.6 | 2.23E+00 |
| 4  | 2  | 77.09*   | 405  | 294   | 0.83 | 154.14  | 145  | 14 | 1.13E-01 | 8.1  |          |
| 5  | 0  | 87.96*   | 1918 | 524   | 0.65 | 175.86  | 172  | 8  | 5.33E-01 | 3.1  |          |
| 6  | 0  | 92.87*   | 165  | 273   | 2.09 | 185.68  | 182  | 8  | 4.57E-02 | 19.2 |          |
| 7  | 0  | 121.92   | 311  | 227   | 0.73 | 243.76  | 240  | 7  | 8.63E-02 | 9.8  |          |
| 8  | 0  | 129.36   | 64   | 298   | 1.00 | 258.62  | 255  | 9  | 1.79E-02 | 49.8 |          |
| 9  | 0  | 143.76   | 66   | 167   | 1.60 | 287.41  | 284  | 7  | 1.84E-02 | 34.6 |          |
| 10 | 0  | 185.61*  | 80   | 232   | 1.37 | 371.08  | 367  | 9  | 2.22E-02 | 36.2 |          |
| 11 | 0  | 209.50   | 65   | 294   | 0.95 | 418.84  | 414  | 11 | 1.81E-02 | 52.2 |          |
| 12 | 4  | 238.50*  | 443  | 133   | 0.83 | 476.81  | 473  | 15 | 1.23E-01 | 6.1  | 2.79E+00 |
| 13 | 4  | 241.54*  | 94   | 170   | 1.41 | 482.90  | 473  | 15 | 2.60E-02 | 27.9 |          |
| 14 | 0  | 294.91*  | 108  | 177   | 1.42 | 589.59  | 586  | 10 | 3.01E-02 | 24.9 |          |
| 15 | 0  | 338.79   | 43   | 139   | 0.74 | 677.34  | 673  | 8  | 1.18E-02 | 50.6 |          |
| 16 | 0  | 351.74*  | 170  | 152   | 1.07 | 703.23  | 699  | 10 | 4.73E-02 | 15.6 |          |
| 17 | 0  | 583.00*  | 105  | 90    | 1.02 | 1165.70 | 1160 | 12 | 2.93E-02 | 20.6 |          |
| 18 | 0  | 608.71*  | 151  | 63    | 1.48 | 1217.10 | 1211 | 12 | 4.18E-02 | 13.5 |          |
| 19 | 0  | 661.40   | 1664 | 94    | 1.33 | 1322.48 | 1317 | 12 | 4.62E-01 | 2.7  |          |
| 20 | 0  | 727.04   | 38   | 30    | 1.40 | 1453.78 | 1450 | 8  | 1.06E-02 | 29.6 |          |
| 21 | 0  | 860.79   | 46   | 41    | 1.47 | 1721.33 | 1716 | 12 | 1.28E-02 | 31.7 |          |
| 22 | 0  | 911.43   | 120  | 94    | 2.02 | 1822.64 | 1814 | 20 | 3.32E-02 | 22.0 |          |
| 23 | 0  | 1172.88  | 1191 | 30    | 1.72 | 2345.75 | 2337 | 17 | 3.31E-01 | 3.1  |          |
| 24 | 0  | 1332.17* | 1074 | 15    | 1.92 | 2664.51 | 2657 | 16 | 2.98E-01 | 3.2  |          |

Flag: "\*" = Peak area was modified by background subtraction



## VMS Nuclide Identification Report V3.1 Generated 11-MAR-2010 20:36:14

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054950.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,MINACT V2.8
Sample title      : MXR1
Sample date       : 2-MAR-2010 00:00:00   Acquisition date : 11-MAR-2010 19:35:21
Sample ID        : G1202054950           Sample quantity  : 155.44 GRAM
Sample type      : SOLID                  Sample geometry   :
Detector name    : GAMMA21               Detector geometry: CAN
Elapsed live time: 0 01:00:00.00         Elapsed real time: 0 01:00:14.04   0.4%
Peak Width (FWHM): 3.00                  Confidence level  : 5.00 %
Energy tolerance : 1.50 keV              Half life ratio   : 8.00
Errors propagated: Yes                   Systematic Error  : 0.00 %
Efficiency type  : Empirical              Efficiencies at   : Peak Energy
Abundance limit  : 75.00                  WTM error limit   : 3.00

```

## Full Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| CO-57   | +         | 122.06       | *   | 2.490E-01           | 5.675E-02 | 4.816E-02      | 5.533E-03 | 5.171   |
|         |           | 136.47       |     | 2.826E-01           | 2.747E-01 | 4.530E-01      | 5.016E-02 | 0.624   |
| CO-60   | +         | 1173.23      |     | 6.502E+00           | 6.691E-01 | 1.400E-01      | 1.154E-02 | 46.438  |
|         | +         | 1332.49      | *   | 6.615E+00           | 6.809E-01 | 9.913E-02      | 8.046E-03 | 66.727  |
| CD-109  | +         | 88.03        | *   | 3.129E+01           | 3.517E+00 | 1.144E+00      | 1.076E-01 | 27.353  |
| SN-126  |           | 64.28        |     | 4.358E-01           | 2.642E-01 | 4.561E-01      | 6.758E-02 | 0.955   |
|         | +         | 86.94        |     | 1.282E+01           | 5.380E+00 | 4.666E-01      | 1.937E-01 | 27.467  |
|         | +         | 87.57        | *   | 3.083E+00           | 3.466E-01 | 1.125E-01      | 1.055E-02 | 27.402  |
| BA-137M | +         | 661.66       | *   | 5.726E+00           | 7.047E-01 | 1.318E-01      | 1.456E-02 | 43.436  |
| CS-137  | +         | 661.66       | *   | 6.049E+00           | 7.451E-01 | 1.393E-01      | 1.540E-02 | 43.436  |
| TL-208  |           | 277.37       |     | -7.843E-02          | 6.181E-01 | 1.006E+00      | 1.281E-01 | -0.078  |
|         | +         | 583.19       | *   | 3.372E-01           | 1.438E-01 | 1.110E-01      | 1.208E-02 | 3.039   |
|         | +         | 860.56       |     | 1.480E+00           | 9.508E-01 | 1.187E+00      | 1.178E-01 | 1.247   |
| BI-211  |           | 72.87        |     | 2.365E-01           | 2.441E+00 | 3.723E+00      | 3.117E-01 | 0.064   |
|         | +         | 351.06       | *   | 2.122E+00           | 6.911E-01 | 6.069E-01      | 5.479E-02 | 3.497   |
| PB-212  | +         | 74.82        |     | 1.283E+00           | 3.864E-01 | 4.406E-01      | 5.687E-02 | 2.913   |
|         | +         | 77.11        |     | 1.385E+00           | 2.551E-01 | 2.663E-01      | 2.297E-02 | 5.201   |
|         | +         | 238.63       | *   | 1.118E+00           | 1.763E-01 | 1.466E-01      | 1.465E-02 | 7.624   |
|         |           | 300.09       |     | 1.056E+00           | 1.521E+00 | 2.330E+00      | 2.513E-01 | 0.453   |
| PB-214  | +         | 74.82        |     | 2.275E+00           | 6.728E-01 | 7.809E-01      | 9.070E-02 | 2.913   |
|         | +         | 77.11        |     | 2.442E+00           | 4.928E-01 | 4.695E-01      | 5.603E-02 | 5.201   |
|         | +         | 242.00       |     | 1.440E+00           | 8.184E-01 | 8.956E-01      | 9.503E-02 | 1.608   |
|         | +         | 295.22       |     | 7.941E-01           | 4.049E-01 | 3.736E-01      | 4.128E-02 | 2.126   |
|         | +         | 351.93       | *   | 7.703E-01           | 2.544E-01 | 2.209E-01      | 2.335E-02 | 3.487   |
| RA-224  | +         | 240.99       | *   | 2.547E+00           | 1.440E+00 | 1.576E+00      | 1.401E-01 | 1.616   |
| TH-228  | +         | 74.82        |     | 1.283E+00           | 3.660E-01 | 4.406E-01      | 3.773E-02 | 2.913   |
|         | +         | 77.11        |     | 1.385E+00           | 2.551E-01 | 2.663E-01      | 2.297E-02 | 5.201   |
|         | +         | 238.63       | *   | 1.118E+00           | 1.763E-01 | 1.466E-01      | 1.465E-02 | 7.624   |
|         |           | 300.09       |     | 1.056E+00           | 1.649E+00 | 2.330E+00      | 1.428E+00 | 0.453   |
| U-235   |           | 89.96        |     | 9.996E-02           | 9.137E-01 | 1.209E+00      | 3.015E-01 | 0.083   |
|         | +         | 93.35        |     | 1.769E+00           | 7.950E-01 | 7.095E-01      | 1.668E-01 | 2.493   |
|         | +         | 143.76       | *   | 4.451E-01           | 3.180E-01 | 3.721E-01      | 6.589E-02 | 1.196   |
|         |           | 163.33       |     | -6.224E-02          | 5.587E-01 | 9.495E-01      | 1.693E-01 | -0.066  |
|         | +         | 185.72       |     | 1.239E-01           | 9.023E-02 | 9.171E-02      | 7.697E-03 | 1.351   |

---- Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         | 205.31    |              |     | -4.888E-01          | 7.436E-01 | 1.060E+00      | 1.924E-01 | -0.461  |
| NP-237  | +         | 86.48        | *   | 9.198E+00           | 2.188E+00 | 3.732E-01      | 8.558E-02 | 24.648  |
|         |           | 95.86        |     | 2.234E-01           | 8.929E-01 | 1.348E+00      | 3.294E-01 | 0.166   |
| AM-241  | +         | 59.54        | *   | 1.338E+01           | 1.188E+00 | 1.694E-01      | 1.437E-02 | 78.992  |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM)      | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|---------------------|-----------|---------|
| BE-7    |           | 477.60       | *   | -1.362E-01          | 6.749E-01 | 1.116E+00           | 1.094E-01 | -0.122  |
| NA-22   |           | 1274.54      | *   | -5.265E-02          | 5.390E-02 | 6.301E-02           | 5.169E-03 | -0.836  |
| NA-24   |           | 1368.63      | *   | -7.890E-04          | 5.390E-02 | Half-Life too short |           |         |
| K-40    |           | 1460.82      | *   | 1.284E+00           | 6.735E-01 | 1.440E+00           | 1.229E-01 | 0.891   |
| SC-46   |           | 889.28       | *   | -3.609E-02          | 1.036E-01 | 1.679E-01           | 1.493E-02 | -0.215  |
|         |           | 1120.55      |     | 1.305E-01           | 1.279E-01 | 2.265E-01           | 1.914E-02 | 0.576   |
| V-48    |           | 944.13       |     | 1.762E-01           | 2.295E+00 | 3.832E+00           | 3.360E-01 | 0.046   |
|         |           | 983.53       | *   | -3.411E-02          | 1.639E-01 | 2.662E-01           | 2.329E-02 | -0.128  |
|         |           | 1312.11      |     | -2.378E-02          | 8.061E-02 | 1.191E-01           | 9.705E-03 | -0.200  |
| CR-51   |           | 320.08       | *   | 3.914E-01           | 5.764E-01 | 9.742E-01           | 9.050E-02 | 0.402   |
| MN-54   |           | 834.85       | *   | 3.288E-02           | 9.254E-02 | 1.597E-01           | 1.548E-02 | 0.206   |
| CO-56   |           | 846.77       | *   | -2.877E-02          | 9.775E-02 | 1.600E-01           | 1.525E-02 | -0.180  |
|         |           | 1037.84      |     | -4.805E-01          | 8.518E-01 | 1.328E+00           | 1.212E-01 | -0.362  |
|         |           | 1238.28      |     | 2.463E-02           | 1.121E-01 | 1.879E-01           | 1.595E-02 | 0.131   |
|         |           | 1771.35      |     | -3.014E-01          | 3.544E-01 | 3.763E-01           | 3.127E-02 | -0.801  |
| CO-58   |           | 810.76       | *   | -4.718E-02          | 9.060E-02 | 1.456E-01           | 1.457E-02 | -0.324  |
| FE-59   |           | 1099.45      | *   | -9.652E-02          | 2.153E-01 | 3.357E-01           | 3.097E-02 | -0.288  |
|         |           | 1291.59      |     | 8.073E-02           | 1.110E-01 | 2.153E-01           | 2.022E-02 | 0.375   |
| ZN-65   |           | 1115.54      | *   | -1.018E-01          | 2.512E-01 | 3.953E-01           | 3.351E-02 | -0.258  |
| SE-75   | +         | 121.12       |     | 1.279E+00           | 3.049E-01 | 3.919E-01           | 5.241E-02 | 3.265   |
|         |           | 136.00       |     | 9.044E-02           | 5.181E-02 | 8.793E-02           | 9.346E-03 | 1.029   |
|         |           | 264.66       | *   | -1.067E-02          | 6.870E-02 | 1.119E-01           | 1.005E-02 | -0.095  |
|         |           | 279.54       |     | -1.966E-01          | 1.746E-01 | 2.632E-01           | 2.430E-02 | -0.747  |
|         |           | 400.66       |     | -1.342E-01          | 5.247E-01 | 8.150E-01           | 8.702E-02 | -0.165  |
| SR-85   |           | 514.00       | *   | -1.648E-01          | 8.052E-02 | 1.118E-01           | 1.076E-02 | -1.474  |
| Y-88    |           | 898.04       |     | 1.465E-02           | 1.092E-01 | 1.843E-01           | 1.620E-02 | 0.079   |
|         |           | 1836.06      | *   | 3.418E-02           | 6.378E-02 | 1.188E-01           | 9.808E-03 | 0.288   |
| Y-91    |           | 1204.77      | *   | 1.133E+01           | 3.117E+01 | 5.339E+01           | 4.398E+00 | 0.212   |
| NB-94   |           | 702.65       | *   | 8.226E-03           | 7.135E-02 | 1.166E-01           | 1.270E-02 | 0.071   |
|         |           | 871.09       |     | 2.043E-02           | 9.445E-02 | 1.608E-01           | 1.476E-02 | 0.127   |
| NB-95   |           | 765.81       | *   | 7.417E-03           | 9.097E-02 | 1.469E-01           | 1.535E-02 | 0.050   |
| NB-95M  |           | 235.69       | *   | -7.008E-02          | 2.003E-01 | 2.907E-01           | 2.935E-02 | -0.241  |
| ZR-95   |           | 724.19       |     | -1.228E-01          | 2.095E-01 | 2.688E-01           | 3.053E-02 | -0.457  |
|         |           | 756.73       | *   | -2.586E-02          | 1.579E-01 | 2.491E-01           | 2.809E-02 | -0.104  |
| MO-99   |           | 140.51       |     | 5.863E+00           | 7.665E+00 | 1.148E+01           | 2.800E+00 | 0.511   |
|         |           | 181.07       |     | 2.404E+00           | 6.184E+00 | 9.687E+00           | 1.807E+00 | 0.248   |
|         |           | 366.42       |     | -1.168E+01          | 5.064E+01 | 7.952E+01           | 6.668E+00 | -0.147  |
|         |           | 739.50       | *   | -9.174E+00          | 8.139E+00 | 1.139E+01           | 1.932E+00 | -0.805  |
|         |           | 777.92       |     | -6.470E-01          | 2.118E+01 | 3.377E+01           | 3.491E+00 | -0.019  |
| TC-99M  |           | 140.51       | *   | 1.590E+04           | 2.118E+01 | Half-Life too short |           |         |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| RU-103  | 497.08    | *            |     | 2.942E-03           | 7.415E-02 | 1.243E-01      | 1.798E-02 | 0.024   |
|         | 610.33    |              |     | 6.497E+00           | 2.211E+00 | 3.574E+00      | 6.251E-01 | 1.818   |
| RH-106  | 621.93    | *            |     | 2.799E-02           | 6.362E-01 | 1.045E+00      | 1.538E-01 | 0.027   |
|         | 1050.41   |              |     | 7.833E-01           | 7.072E+00 | 1.173E+01      | 1.015E+00 | 0.067   |
| RU-106  | 621.93    | *            |     | 2.799E-02           | 6.362E-01 | 1.045E+00      | 1.122E-01 | 0.027   |
|         | 1050.41   |              |     | 7.833E-01           | 7.072E+00 | 1.173E+01      | 1.015E+00 | 0.067   |
| AG-108M | 433.94    | *            |     | -1.784E-02          | 6.107E-02 | 1.013E-01      | 8.966E-03 | -0.176  |
|         | 614.28    |              |     | 9.919E-03           | 7.303E-02 | 1.068E-01      | 1.164E-02 | 0.093   |
|         | 722.91    |              |     | -2.110E-02          | 8.980E-02 | 1.220E-01      | 1.342E-02 | -0.173  |
| AG-110M | 657.76    | *            |     | -3.002E-03          | 9.129E-02 | 1.295E-01      | 1.452E-02 | -0.023  |
|         | 677.62    |              |     | -1.627E-01          | 6.701E-01 | 1.061E+00      | 1.187E-01 | -0.153  |
|         | 706.68    |              |     | -2.969E-01          | 4.460E-01 | 6.689E-01      | 7.403E-02 | -0.444  |
|         | 763.94    |              |     | 1.705E-01           | 3.692E-01 | 6.171E-01      | 6.580E-02 | 0.276   |
|         | 884.68    |              |     | 1.422E-01           | 1.317E-01 | 2.380E-01      | 2.197E-02 | 0.598   |
|         | 937.49    |              |     | -6.032E-02          | 3.426E-01 | 5.617E-01      | 5.097E-02 | -0.107  |
|         | 1384.29   |              |     | -1.391E-01          | 2.014E-01 | 2.732E-01      | 2.305E-02 | -0.509  |
|         | 1505.03   |              |     | -2.590E-01          | 4.652E-01 | 6.701E-01      | 5.576E-02 | -0.386  |
| SN-113  | 391.69    | *            |     | -3.664E-02          | 8.881E-02 | 1.365E-01      | 1.124E-02 | -0.268  |
| CD-115  | 260.90    |              |     | -1.969E+01          | 4.347E+01 | 6.957E+01      | 6.218E+00 | -0.283  |
|         | 492.35    |              |     | 4.174E+00           | 1.492E+01 | 2.547E+01      | 2.383E+00 | 0.164   |
|         | 527.90    | *            |     | -4.437E+00          | 4.432E+00 | 6.693E+00      | 6.549E-01 | -0.663  |
| SN-117M | 156.02    |              |     | -1.125E+00          | 2.142E+00 | 3.576E+00      | 3.228E-01 | -0.314  |
|         | 158.56    | *            |     | -1.611E-02          | 5.106E-02 | 8.605E-02      | 7.575E-03 | -0.187  |
| TE-123M | 159.00    | *            |     | 6.419E-03           | 3.377E-02 | 5.837E-02      | 5.145E-03 | 0.110   |
| SB-124  | 602.73    |              |     | -2.125E-02          | 7.640E-02 | 1.056E-01      | 1.116E-02 | -0.201  |
|         | 645.85    |              |     | -1.348E-01          | 1.028E+00 | 1.656E+00      | 1.874E-01 | -0.081  |
|         | 722.78    |              |     | -1.353E-01          | 8.536E-01 | 1.174E+00      | 1.284E-01 | -0.115  |
|         | 1690.97   | *            |     | -5.121E-02          | 1.345E-01 | 1.956E-01      | 1.707E-02 | -0.262  |
| SB-125  | 427.87    | *            |     | -8.614E-02          | 1.818E-01 | 2.980E-01      | 2.577E-02 | -0.289  |
|         | 463.37    |              |     | 3.732E-01           | 6.196E-01 | 1.077E+00      | 1.035E-01 | 0.346   |
|         | 600.60    |              |     | 3.178E-02           | 3.251E-01 | 5.387E-01      | 5.962E-02 | 0.059   |
|         | 635.95    |              |     | -1.321E-01          | 6.053E-01 | 9.683E-01      | 1.105E-01 | -0.136  |
| TE-125M | 109.28    | *            |     | 2.404E+00           | 9.661E+00 | 1.562E+01      | 1.897E+00 | 0.154   |
| I-126   | 388.63    |              |     | -6.185E-02          | 2.491E-01 | 3.881E-01      | 3.108E-02 | -0.159  |
|         | 666.33    | *            |     | -3.615E-02          | 4.157E-01 | 5.843E-01      | 6.446E-02 | -0.062  |
|         | 753.82    |              |     | 2.119E+00           | 3.202E+00 | 5.453E+00      | 5.754E-01 | 0.389   |
| SB-126  | 414.70    |              |     | 8.443E-03           | 1.096E-01 | 1.869E-01      | 1.550E-02 | 0.045   |
|         | 666.50    |              |     | 5.308E-02           | 1.346E-01 | 2.011E-01      | 2.218E-02 | 0.264   |
|         | 695.00    |              |     | 4.767E-02           | 1.311E-01 | 2.190E-01      | 2.393E-02 | 0.218   |
|         | 697.00    |              |     | -2.917E-01          | 4.578E-01 | 6.946E-01      | 7.583E-02 | -0.420  |
|         | 720.70    | *            |     | 1.587E-01           | 2.368E-01 | 4.056E-01      | 4.376E-02 | 0.391   |
|         | 856.80    |              |     | 4.858E-02           | 9.926E-01 | 1.457E+00      | 1.368E-01 | 0.033   |
| SB-127  | 252.40    |              |     | -1.561E+00          | 2.705E+00 | 4.183E+00      | 1.725E+00 | -0.373  |
|         | 473.00    |              |     | -2.813E-01          | 1.480E+00 | 2.453E+00      | 2.930E-01 | -0.115  |
|         | 685.70    | *            |     | 8.523E-01           | 1.132E+00 | 1.955E+00      | 2.364E-01 | 0.436   |
|         | 783.70    |              |     | 1.199E+00           | 3.385E+00 | 5.584E+00      | 6.951E-01 | 0.215   |
| I-131   | 80.19     |              |     | 1.278E+00           | 2.558E+00 | 3.958E+00      | 3.503E-01 | 0.323   |
|         | 284.31    |              |     | -3.784E-01          | 1.593E+00 | 2.565E+00      | 2.391E-01 | -0.148  |
|         | 364.49    | *            |     | -7.188E-03          | 1.460E-01 | 2.325E-01      | 2.060E-02 | -0.031  |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TE-132  | +         | 636.99       |     | -1.257E+00          | 2.298E+00 | 3.560E+00      | 3.997E-01 | -0.353  |
|         |           | 49.72        |     | 5.381E+00           | 3.880E+00 | 4.408E+00      | 4.177E-01 | 1.221   |
|         |           | 111.76       |     | -1.844E+00          | 1.153E+01 | 1.815E+01      | 2.111E+00 | -0.102  |
|         |           | 116.30       |     | -4.097E+00          | 9.972E+00 | 1.536E+01      | 1.832E+00 | -0.267  |
| BA-133  | *         | 228.16       |     | 7.632E-02           | 3.469E-01 | 5.846E-01      | 8.799E-02 | 0.131   |
|         |           | 81.00        |     | -3.157E-02          | 8.662E-02 | 1.276E-01      | 1.998E-02 | -0.248  |
|         |           | 276.40       |     | 3.932E-02           | 5.862E-01 | 9.657E-01      | 1.381E-01 | 0.041   |
|         |           | 302.85       |     | -1.317E-01          | 2.565E-01 | 4.027E-01      | 5.341E-02 | -0.327  |
| I-133   | *         | 356.01       |     | 5.813E-02           | 8.808E-02 | 1.332E-01      | 1.717E-02 | 0.437   |
|         |           | 383.85       |     | -3.768E-02          | 5.809E-01 | 9.197E-01      | 1.110E-01 | -0.041  |
|         |           | 529.87       |     | -5.548E-05          | 5.809E-01 | Half-Life      | too short |         |
|         |           | 875.33       |     | 4.614E-04           | 5.809E-01 | Half-Life      | too short |         |
| CS-134  |           | 1298.22      |     | 2.910E-03           | 5.809E-01 | Half-Life      | too short |         |
|         |           | 563.25       |     | 4.048E-01           | 7.652E-01 | 1.315E+00      | 1.347E-01 | 0.308   |
|         |           | 569.33       |     | 3.418E-01           | 4.119E-01 | 7.228E-01      | 7.471E-02 | 0.473   |
|         |           | 604.72       |     | 1.752E-02           | 6.498E-02 | 9.700E-02      | 1.028E-02 | 0.181   |
| CS-135  | *         | 795.86       |     | -1.120E-02          | 1.158E-01 | 1.831E-01      | 1.869E-02 | -0.061  |
|         |           | 801.95       |     | -2.693E-03          | 9.322E-01 | 1.572E+00      | 1.593E-01 | -0.002  |
|         |           | 1365.19      |     | 1.777E-01           | 1.431E+00 | 2.475E+00      | 2.125E-01 | 0.072   |
|         |           | 268.22       |     | -1.620E-01          | 2.491E-01 | 3.917E-01      | 4.011E-02 | -0.414  |
| I-135   |           | 546.56       |     | 1.994E+04           | 2.491E-01 | Half-Life      | too short |         |
|         |           | 836.80       |     | 1.227E+04           | 2.491E-01 | Half-Life      | too short |         |
|         |           | 1038.76      |     | -5.344E+04          | 2.491E-01 | Half-Life      | too short |         |
|         |           | 1131.51      |     | -1.361E+04          | 2.491E-01 | Half-Life      | too short |         |
| CS-136  | *         | 1260.41      |     | -4.489E+03          | 2.491E-01 | Half-Life      | too short |         |
|         |           | 1457.56      |     | -2.552E+04          | 2.491E-01 | Half-Life      | too short |         |
|         |           | 1678.03      |     | -3.085E+04          | 2.491E-01 | Half-Life      | too short |         |
|         |           | 1791.20      |     | 1.198E+04           | 2.491E-01 | Half-Life      | too short |         |
| CE-139  |           | 153.25       |     | 3.414E-01           | 7.564E-01 | 1.326E+00      | 1.433E-01 | 0.257   |
|         |           | 176.60       |     | -3.243E-01          | 4.827E-01 | 7.898E-01      | 7.260E-02 | -0.411  |
|         |           | 273.65       |     | -2.030E-01          | 6.494E-01 | 1.045E+00      | 1.007E-01 | -0.194  |
|         |           | 340.55       |     | 7.154E-02           | 2.100E-01 | 3.106E-01      | 2.801E-02 | 0.230   |
| BA-140  | *         | 818.51       |     | -3.742E-02          | 1.436E-01 | 2.365E-01      | 2.341E-02 | -0.158  |
|         |           | 1048.07      |     | -4.118E-02          | 2.281E-01 | 3.687E-01      | 3.322E-02 | -0.112  |
|         |           | 1235.36      |     | 6.845E-01           | 6.180E-01 | 1.161E+00      | 1.332E-01 | 0.590   |
|         |           | 165.86       |     | 1.255E-02           | 3.877E-02 | 6.717E-02      | 5.460E-03 | 0.187   |
| LA-140  | *         | 162.66       |     | -5.843E-01          | 7.766E-01 | 1.276E+00      | 1.151E-01 | -0.458  |
|         |           | 304.85       |     | 2.059E+00           | 1.824E+00 | 3.015E+00      | 8.850E-01 | 0.683   |
|         |           | 423.72       |     | 1.216E-01           | 2.934E+00 | 4.985E+00      | 1.637E+00 | 0.024   |
|         |           | 537.26       |     | -3.200E-02          | 4.196E-01 | 6.916E-01      | 2.369E-01 | -0.046  |
| CE-141  | *         | 328.76       |     | -6.643E-02          | 4.114E-01 | 6.570E-01      | 6.096E-02 | -0.101  |
|         |           | 487.02       |     | -5.434E-02          | 2.046E-01 | 3.353E-01      | 3.281E-02 | -0.162  |
|         |           | 815.77       |     | -7.375E-02          | 6.086E-01 | 1.014E+00      | 1.097E-01 | -0.073  |
|         |           | 1596.21      |     | -8.488E-02          | 1.026E-01 | 1.281E-01      | 1.072E-02 | -0.662  |
| CE-143  | *         | 145.44       |     | -2.132E-02          | 7.494E-02 | 1.046E-01      | 1.049E-02 | -0.204  |
|         |           | 57.36        |     | 3.048E+01           | 5.975E+01 | 9.363E+01      | 9.276E+00 | 0.326   |
|         |           | 293.27       |     | 2.336E+01           | 1.582E+01 | 2.477E+01      | 5.341E+00 | 0.943   |
|         |           | 664.57       |     | 1.085E+02           | 2.292E+02 | 3.397E+02      | 1.046E+02 | 0.320   |
|         |           | 721.93       |     | 9.329E+00           | 2.220E+02 | 3.143E+02      | 9.038E+01 | 0.030   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| CE-144  |           | 80.12        |     | 9.925E-01           | 2.154E+00 | 3.327E+00      | 2.936E-01 | 0.298   |
|         |           | 133.52       | *   | -2.122E-01          | 2.775E-01 | 3.731E-01      | 6.186E-02 | -0.569  |
| PM-144  |           | 476.78       |     | 1.589E-02           | 1.445E-01 | 2.440E-01      | 2.406E-02 | 0.065   |
|         |           | 618.01       |     | 3.035E-03           | 6.456E-02 | 1.062E-01      | 1.156E-02 | 0.029   |
|         |           | 696.49       | *   | -4.182E-02          | 8.128E-02 | 1.252E-01      | 1.368E-02 | -0.334  |
| PR-144  |           | 696.51       | *   | -3.132E+00          | 6.065E+00 | 9.344E+00      | 1.020E+00 | -0.335  |
|         |           | 1489.16      |     | -6.265E+00          | 2.142E+01 | 3.309E+01      | 2.749E+00 | -0.189  |
| PM-146  |           | 453.88       | *   | 4.484E-02           | 9.743E-02 | 1.684E-01      | 1.815E-02 | 0.266   |
|         |           | 633.25       |     | 6.341E-01           | 3.248E+00 | 5.380E+00      | 2.085E+00 | 0.118   |
|         |           | 735.93       |     | 1.907E-01           | 3.428E-01 | 5.739E-01      | 1.649E-01 | 0.332   |
|         |           | 747.24       |     | 7.246E-02           | 2.300E-01 | 3.803E-01      | 6.023E-02 | 0.191   |
| ND-147  |           | 91.11        |     | -1.251E-01          | 2.061E-01 | 2.582E-01      | 2.635E-02 | -0.485  |
|         |           | 319.41       |     | 1.672E+00           | 4.364E+00 | 7.241E+00      | 6.411E-01 | 0.231   |
|         |           | 531.02       | *   | 5.434E-01           | 8.045E-01 | 1.403E+00      | 2.198E-01 | 0.387   |
| PM-149  |           | 285.90       | *   | 4.440E-01           | 2.943E+01 | 4.815E+01      | 7.560E+00 | 0.009   |
| EU-152  | +         | 121.78       |     | 7.261E-01           | 1.692E-01 | 2.329E-01      | 2.901E-02 | 3.117   |
|         |           | 244.70       |     | -9.447E-02          | 5.445E-01 | 7.966E-01      | 7.091E-02 | -0.119  |
|         |           | 344.28       | *   | -2.551E-02          | 1.857E-01 | 2.956E-01      | 2.710E-02 | -0.086  |
|         |           | 778.90       |     | 2.226E-01           | 6.007E-01 | 9.967E-01      | 1.029E-01 | 0.223   |
|         |           | 964.08       |     | -7.160E-01          | 9.384E-01 | 1.474E+00      | 1.292E-01 | -0.486  |
|         |           | 1085.87      |     | 6.720E-01           | 1.110E+00 | 1.912E+00      | 1.637E-01 | 0.351   |
|         |           | 1112.07      |     | 1.110E-02           | 8.300E-01 | 1.357E+00      | 1.151E-01 | 0.008   |
|         |           | 1408.01      |     | -3.898E-02          | 3.037E-01 | 4.940E-01      | 4.064E-02 | -0.079  |
| GD-153  |           | 69.67        |     | -2.487E-01          | 1.184E+00 | 1.930E+00      | 1.582E-01 | -0.129  |
|         |           | 97.43        | *   | -8.822E-02          | 8.125E-02 | 1.212E-01      | 1.198E-02 | -0.728  |
|         |           | 103.18       |     | 3.518E-02           | 1.134E-01 | 1.847E-01      | 1.886E-02 | 0.190   |
| EU-154  | +         | 123.07       |     | 5.131E-01           | 1.229E-01 | 1.421E-01      | 1.934E-02 | 3.610   |
|         |           | 723.31       |     | -2.699E-01          | 4.129E-01 | 5.230E-01      | 6.007E-02 | -0.516  |
|         |           | 873.19       |     | 5.380E-01           | 7.651E-01 | 1.347E+00      | 1.654E-01 | 0.399   |
|         |           | 996.26       |     | 8.402E-01           | 1.032E+00 | 1.801E+00      | 3.157E-01 | 0.466   |
|         |           | 1004.73      |     | -6.089E-01          | 5.673E-01 | 8.316E-01      | 9.742E-02 | -0.732  |
|         |           | 1274.44      | *   | -1.366E-01          | 1.477E-01 | 1.735E-01      | 1.919E-02 | -0.787  |
| EU-155  | +         | 86.55        |     | 3.730E+00           | 4.219E-01 | 2.098E-01      | 1.967E-02 | 17.778  |
|         |           | 105.31       | *   | 4.733E-02           | 1.149E-01 | 1.878E-01      | 1.958E-02 | 0.252   |
| TB-160  | +         | 86.79        |     | 9.424E+00           | 1.060E+00 | 6.546E-01      | 6.096E-02 | 14.397  |
|         |           | 197.04       |     | 3.811E-01           | 7.296E-01 | 1.261E+00      | 1.076E-01 | 0.302   |
|         |           | 215.65       |     | -3.182E-01          | 1.080E+00 | 1.779E+00      | 1.551E-01 | -0.179  |
|         |           | 298.57       |     | 3.660E-02           | 2.044E-01 | 3.015E-01      | 2.690E-02 | 0.121   |
|         |           | 879.36       | *   | -3.682E-01          | 3.529E-01 | 5.331E-01      | 4.825E-02 | -0.691  |
|         |           | 962.29       |     | -3.680E-01          | 1.553E+00 | 2.542E+00      | 2.228E-01 | -0.145  |
|         |           | 966.15       |     | 5.165E-01           | 5.978E-01 | 1.043E+00      | 9.136E-02 | 0.495   |
|         |           | 1177.93      |     | -3.229E-02          | 6.796E-01 | 9.428E-01      | 7.769E-02 | -0.034  |
|         |           | 1271.85      |     | 1.220E-01           | 8.119E-01 | 1.355E+00      | 1.110E-01 | 0.090   |
| HO-166M |           | 80.57        |     | 7.394E-02           | 2.405E-01 | 3.683E-01      | 3.261E-02 | 0.201   |
|         | +         | 184.41       |     | 9.847E-02           | 7.168E-02 | 7.391E-02      | 6.191E-03 | 1.332   |
|         |           | 280.46       |     | -4.679E-02          | 1.360E-01 | 2.175E-01      | 1.940E-02 | -0.215  |
|         |           | 410.95       |     | 1.201E-01           | 4.908E-01 | 7.907E-01      | 6.514E-02 | 0.152   |
|         |           | 711.68       | *   | 6.122E-02           | 1.418E-01 | 2.377E-01      | 2.577E-02 | 0.258   |
|         |           | 752.31       |     | 2.590E-01           | 6.422E-01 | 1.071E+00      | 1.131E-01 | 0.242   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TA-182  |           | 810.29       |     | -9.851E-02          | 1.417E-01 | 2.235E-01      | 2.234E-02 | -0.441  |
|         |           | 67.75        |     | 1.862E-02           | 6.659E-02 | 1.111E-01      | 9.004E-03 | 0.168   |
|         |           | 100.11       |     | 1.192E-01           | 1.667E-01 | 2.782E-01      | 2.790E-02 | 0.429   |
|         |           | 152.43       |     | -2.709E-01          | 4.390E-01 | 6.509E-01      | 6.073E-02 | -0.416  |
|         |           | 222.11       |     | -7.444E-01          | 5.277E-01 | 8.065E-01      | 7.074E-02 | -0.923  |
|         |           | 1121.30      |     | 2.374E-01           | 3.669E-01 | 6.314E-01      | 5.334E-02 | 0.376   |
|         |           | 1189.05      |     | 5.249E-02           | 5.482E-01 | 9.009E-01      | 7.424E-02 | 0.058   |
| IR-192  |           | 1221.41      | *   | 3.633E-02           | 2.615E-01 | 4.334E-01      | 3.568E-02 | 0.084   |
|         |           | 1231.02      |     | 2.122E-01           | 6.816E-01 | 1.157E+00      | 9.516E-02 | 0.183   |
|         | +         | 295.96       |     | 5.586E-01           | 2.825E-01 | 3.526E-01      | 3.168E-02 | 1.584   |
|         |           | 308.46       |     | -4.636E-02          | 1.545E-01 | 2.454E-01      | 2.195E-02 | -0.189  |
|         |           | 316.51       | *   | 1.313E-02           | 6.220E-02 | 1.021E-01      | 9.076E-03 | 0.129   |
|         |           | 468.07       |     | 6.180E-02           | 1.455E-01 | 2.506E-01      | 2.416E-02 | 0.247   |
|         |           | 70.83        |     | -5.429E-02          | 9.377E-01 | 1.422E+00      | 2.257E-01 | -0.038  |
| HG-203  |           | 72.87        |     | 5.441E-02           | 5.614E-01 | 8.565E-01      | 1.319E-01 | 0.064   |
|         |           | 279.20       | *   | -3.303E-02          | 5.720E-02 | 9.000E-02      | 8.216E-03 | -0.367  |
| BI-207  |           | 72.81        |     | 9.676E-03           | 1.402E-01 | 2.136E-01      | 1.787E-02 | 0.045   |
|         | +         | 74.97        |     | 3.698E-01           | 1.054E-01 | 1.691E-01      | 1.436E-02 | 2.187   |
|         |           | 569.70       |     | 2.185E-02           | 6.632E-02 | 1.122E-01      | 1.149E-02 | 0.195   |
|         |           | 1063.66      | *   | -9.188E-02          | 1.525E-01 | 2.362E-01      | 2.036E-02 | -0.389  |
|         |           | 1770.23      |     | -9.722E-01          | 8.514E-01 | 8.018E-01      | 6.663E-02 | -1.212  |
| PB-210  |           | 46.54        | *   | 7.211E-01           | 8.373E-01 | 1.357E+00      | 1.283E-01 | 0.531   |
| PB-211  |           | 404.85       | *   | 8.208E-02           | 1.547E+00 | 2.458E+00      | 1.187E+00 | 0.033   |
|         |           | 427.09       |     | -1.919E+00          | 3.180E+00 | 4.957E+00      | 2.292E+00 | -0.387  |
|         |           | 832.01       |     | 9.471E-01           | 2.440E+00 | 4.149E+00      | 2.160E+00 | 0.228   |
| BI-212  | +         | 727.33       | *   | 1.949E+00           | 1.186E+00 | 2.005E+00      | 2.810E-01 | 0.972   |
|         |           | 785.37       |     | 3.377E+00           | 7.911E+00 | 1.313E+01      | 1.348E+00 | 0.257   |
|         |           | 1620.50      |     | 1.440E+00           | 3.327E+00 | 6.143E+00      | 5.138E-01 | 0.234   |
| BI-214  | +         | 609.32       | *   | 9.401E-01           | 2.767E-01 | 3.949E-01      | 4.683E-02 | 2.380   |
|         |           | 1120.29      |     | 7.484E-01           | 8.050E-01 | 1.412E+00      | 1.523E-01 | 0.530   |
|         |           | 1764.49      |     | 9.345E-01           | 4.969E-01 | 1.098E+00      | 9.131E-02 | 0.851   |
| RN-219  |           | 271.23       |     | 3.870E-01           | 3.786E-01 | 6.560E-01      | 6.901E-02 | 0.590   |
| RA-223  |           | 401.81       | *   | 8.226E-01           | 8.545E-01 | 1.436E+00      | 2.094E-01 | 0.573   |
|         |           | 81.07        |     | -7.714E-02          | 1.962E-01 | 2.887E-01      | 2.567E-02 | -0.267  |
|         |           | 83.79        |     | 1.882E-01           | 1.212E-01 | 1.957E-01      | 1.778E-02 | 0.962   |
|         |           | 94.87        |     | 2.963E-01           | 4.226E-01 | 6.580E-01      | 6.410E-02 | 0.450   |
|         | +         | 144.24       |     | 1.492E+00           | 1.045E+00 | 1.386E+00      | 1.505E-01 | 1.077   |
| RA-226  |           | 154.21       |     | 4.217E-01           | 4.602E-01 | 8.214E-01      | 8.180E-02 | 0.513   |
|         |           | 269.46       |     | -4.397E-02          | 2.878E-01 | 4.683E-01      | 4.262E-02 | -0.094  |
|         |           | 323.87       | *   | -3.893E-02          | 1.140E+00 | 1.838E+00      | 3.205E-01 | -0.021  |
|         | +         | 338.28       |     | 2.330E+00           | 2.375E+00 | 3.204E+00      | 3.890E-01 | 0.727   |
|         | +         | 609.32       | *   | 9.401E-01           | 2.767E-01 | 3.949E-01      | 4.683E-02 | 2.380   |
| AC-227  |           | 1120.29      |     | 7.484E-01           | 8.050E-01 | 1.412E+00      | 1.523E-01 | 0.530   |
|         |           | 1764.49      |     | 9.345E-01           | 4.969E-01 | 1.098E+00      | 9.131E-02 | 0.851   |
|         |           | 79.69        |     | 4.444E-02           | 1.083E+00 | 1.637E+00      | 2.835E-01 | 0.027   |
|         |           | 235.96       |     | -7.872E-02          | 2.517E-01 | 3.662E-01      | 3.862E-02 | -0.215  |
|         |           | 256.23       | *   | 7.201E-02           | 4.175E-01 | 6.957E-01      | 8.540E-02 | 0.104   |
|         |           | 299.98       |     | 1.161E+00           | 1.674E+00 | 2.562E+00      | 3.308E-01 | 0.453   |
|         |           | 304.50       |     | 3.321E+00           | 2.812E+00 | 4.833E+00      | 8.062E-01 | 0.687   |

---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
| TH-227  |           | 334.37       |     | -2.514E+00          | 3.588E+00 | 4.794E+00      | 7.508E-01 | -0.524  |
|         |           | 79.80        |     | 3.995E-01           | 1.419E+00 | 2.170E+00      | 4.741E-01 | 0.184   |
|         |           | 235.96       |     | -7.872E-02          | 2.517E-01 | 3.662E-01      | 3.652E-02 | -0.215  |
|         |           | 256.23       | *   | 7.201E-02           | 4.175E-01 | 6.957E-01      | 9.604E-02 | 0.104   |
|         |           | 299.98       |     | 1.161E+00           | 1.674E+00 | 2.562E+00      | 3.308E-01 | 0.453   |
| AC-228  |           | 304.50       |     | 3.321E+00           | 2.812E+00 | 4.833E+00      | 8.062E-01 | 0.687   |
|         |           | 334.37       |     | -2.514E+00          | 3.588E+00 | 4.794E+00      | 7.508E-01 | -0.524  |
|         | +         | 338.32       |     | 5.871E-01           | 6.427E-01 | 8.075E-01      | 3.370E-01 | 0.727   |
|         | +         | 911.20       | *   | 1.972E+00           | 8.960E-01 | 9.217E-01      | 1.078E-01 | 2.139   |
|         |           | 968.97       |     | 4.870E-01           | 8.632E-01 | 1.467E+00      | 3.582E-01 | 0.332   |
| RA-228  | +         | 338.32       |     | 5.871E-01           | 6.427E-01 | 8.075E-01      | 3.370E-01 | 0.727   |
|         | +         | 911.20       | *   | 1.972E+00           | 8.960E-01 | 9.217E-01      | 1.078E-01 | 2.139   |
| TH-229  |           | 968.97       |     | 4.870E-01           | 8.632E-01 | 1.467E+00      | 3.582E-01 | 0.332   |
|         |           | 85.43        |     | -1.500E-02          | 2.102E-01 | 3.147E-01      | 2.898E-02 | -0.048  |
|         | +         | 88.47        |     | 4.752E+00           | 5.343E-01 | 5.224E-01      | 4.926E-02 | 9.097   |
|         |           | 193.51       | *   | -5.290E-01          | 7.231E-01 | 1.171E+00      | 9.940E-02 | -0.452  |
|         | +         | 210.85       |     | 2.285E+00           | 2.393E+00 | 2.194E+00      | 1.903E-01 | 1.042   |
| PA-231  |           | 283.69       | *   | 1.179E+00           | 2.405E+00 | 4.046E+00      | 5.975E-01 | 0.291   |
|         |           | 301.36       |     | -3.175E-01          | 9.863E-01 | 1.571E+00      | 1.942E-01 | -0.202  |
| TH-231  |           | 81.07        |     | -7.714E-02          | 1.962E-01 | 2.887E-01      | 2.567E-02 | -0.267  |
|         |           | 83.79        |     | 1.882E-01           | 1.212E-01 | 1.957E-01      | 1.778E-02 | 0.962   |
|         |           | 94.87        |     | 2.963E-01           | 4.226E-01 | 6.580E-01      | 6.410E-02 | 0.450   |
|         | +         | 144.24       |     | 1.492E+00           | 1.045E+00 | 1.386E+00      | 1.505E-01 | 1.077   |
|         |           | 154.21       |     | 4.217E-01           | 4.602E-01 | 8.214E-01      | 8.180E-02 | 0.513   |
| TH-232  |           | 269.46       |     | -4.397E-02          | 2.878E-01 | 4.683E-01      | 4.262E-02 | -0.094  |
|         |           | 323.87       | *   | -3.893E-02          | 1.140E+00 | 1.838E+00      | 3.205E-01 | -0.021  |
|         | +         | 338.28       |     | 2.330E+00           | 2.375E+00 | 3.204E+00      | 3.890E-01 | 0.727   |
|         | +         | 338.32       |     | 5.871E-01           | 5.964E-01 | 8.075E-01      | 7.039E-02 | 0.727   |
|         | +         | 911.20       | *   | 1.972E+00           | 8.960E-01 | 9.217E-01      | 1.078E-01 | 2.139   |
| PA-233  |           | 968.97       |     | 4.870E-01           | 8.632E-01 | 1.467E+00      | 3.582E-01 | 0.332   |
|         |           | 300.13       |     | 5.258E-01           | 7.590E-01 | 1.160E+00      | 1.741E-01 | 0.453   |
|         |           | 311.90       | *   | -7.594E-02          | 1.165E-01 | 1.801E-01      | 1.644E-02 | -0.422  |
| PA-234  |           | 340.48       |     | 4.775E-01           | 1.195E+00 | 1.770E+00      | 4.264E-01 | 0.270   |
|         |           | 94.67        |     | 1.368E-01           | 1.585E-01 | 2.481E-01      | 3.275E-02 | 0.551   |
|         |           | 98.44        |     | 1.982E-02           | 8.765E-02 | 1.415E-01      | 7.927E-02 | 0.140   |
|         |           | 111.00       |     | -5.934E-02          | 2.003E-01 | 3.126E-01      | 4.268E-02 | -0.190  |
|         |           | 131.20       |     | 7.797E-02           | 1.370E-01 | 2.063E-01      | 2.249E-02 | 0.378   |
| PA-234M |           | 569.50       |     | 2.133E-01           | 5.905E-01 | 1.002E+00      | 1.025E-01 | 0.213   |
|         |           | 733.00       |     | -5.483E-01          | 8.995E-01 | 1.287E+00      | 2.972E-01 | -0.426  |
|         |           | 880.51       |     | -1.886E-01          | 7.391E-01 | 1.208E+00      | 1.091E-01 | -0.156  |
|         |           | 883.24       |     | 2.253E-02           | 7.872E-01 | 1.318E+00      | 8.869E-01 | 0.017   |
|         |           | 926.50       |     | 1.085E-01           | 5.571E-01 | 9.388E-01      | 2.378E-01 | 0.116   |
| TH-234  |           | 946.00       | *   | -2.210E-01          | 9.789E-01 | 1.597E+00      | 3.007E-01 | -0.138  |
|         |           | 949.00       |     | 1.887E-01           | 1.435E+00 | 2.406E+00      | 2.109E-01 | 0.078   |
|         |           | 766.42       |     | -2.886E+00          | 2.583E+01 | 4.087E+01      | 2.088E+01 | -0.071  |
|         |           | 1001.03      | *   | 1.068E+01           | 1.214E+01 | 2.150E+01      | 2.163E+00 | 0.497   |
|         |           | 63.29        | *   | 3.815E-01           | 6.732E-01 | 1.137E+00      | 2.053E-01 | 0.335   |
| U-238   | +         | 92.59        |     | 2.342E+00           | 1.040E+00 | 1.136E+00      | 2.555E-01 | 2.062   |
|         |           | 63.29        | *   | 3.815E-01           | 6.732E-01 | 1.137E+00      | 2.053E-01 | 0.335   |

Sample ID : G1202054950

Acquisition date : 11-MAR-2010 19:35:21

## ---- Non-Identified Nuclides ----

| Nuclide | Line Ided | Energy (keV) | Key | Activity (pCi/GRAM) | Act error | MDA (pCi/GRAM) | MDA error | Act/MDA |
|---------|-----------|--------------|-----|---------------------|-----------|----------------|-----------|---------|
|         | +         | 92.59        |     | 2.342E+00           | 9.251E-01 | 1.136E+00      | 1.093E-01 | 2.062   |
| NP-239  |           | 99.53        |     | 1.426E-01           | 1.585E-01 | 2.669E-01      | 2.668E-02 | 0.534   |
|         |           | 103.37       |     | 4.110E-02           | 1.054E-01 | 1.723E-01      | 1.761E-02 | 0.239   |
|         |           | 106.12       |     | 2.284E-02           | 8.873E-02 | 1.438E-01      | 1.494E-02 | 0.159   |
|         |           | 117.23       | *   | -2.122E-01          | 4.473E-01 | 6.858E-01      | 7.633E-02 | -0.309  |
|         |           | 228.18       |     | 6.893E-02           | 3.252E-01 | 5.479E-01      | 4.830E-02 | 0.126   |
|         |           | 277.60       |     | -1.647E-01          | 2.896E-01 | 4.574E-01      | 4.081E-02 | -0.360  |
| CM-247  |           | 278.00       |     | 1.500E-01           | 1.169E+00 | 1.933E+00      | 1.724E-01 | 0.078   |
|         |           | 287.50       |     | 1.132E+00           | 2.012E+00 | 3.405E+00      | 3.039E-01 | 0.333   |
|         |           | 402.40       | *   | 2.362E-02           | 8.018E-02 | 1.297E-01      | 1.052E-02 | 0.182   |
| CF-249  |           | 252.80       |     | -1.092E+00          | 1.514E+00 | 2.385E+00      | 2.129E-01 | -0.458  |
|         |           | 333.37       |     | -3.939E-01          | 3.500E-01 | 4.859E-01      | 4.257E-02 | -0.811  |
|         |           | 388.16       | *   | 1.868E-02           | 7.728E-02 | 1.252E-01      | 1.003E-02 | 0.149   |
| CF-251  |           | 177.52       | *   | 4.634E-02           | 1.662E-01 | 2.862E-01      | 2.372E-02 | 0.162   |
|         |           | 227.38       |     | 1.322E-01           | 5.400E-01 | 9.116E-01      | 8.030E-02 | 0.145   |
|         |           | 285.41       |     | 2.559E-01           | 3.659E+00 | 6.009E+00      | 5.363E-01 | 0.043   |
| ANH-511 |           | 511.00       | *   | 5.354E-02           | 7.344E-02 | 1.364E-01      | 1.308E-02 | 0.392   |



# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054950      *
* Acquisition date   : 11-MAR-2010 19:35:21 Detector SN#      :              *
* Detector ID        : GAM21          Sensitivity             : 5.000         *
* Geometry           : CAN            Energy tolerance        : 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit         : 75.000        *
* Elapsed real time  : 0 01:00:14.04 Half life ratio         : 8.000         *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date        : 2-MAR-2010 00:00:00 Nuclide Library    : SOLID         *
* Sample ID          : G1202054950      Analyst initials     : MXR1          *
* Batch Number       : 958216           Sample Quantity      : 1.5544E+02 GRAM *
* Recovery           : 1.00000          Carrier Weight       : 0.00000        *
*****
*
*                                     QC DATA                                *
*
* Standard Weight    : 0.00000                                                *
* CALIB. DATE/TIME   : 28-JUL-2009 10:09:51 MS Isotope        :              *
* MSD DPM             : 0.000          MSD Isotope            :              *
* LCS DPM             : 0.000          LCS Isotope             :              *
* LCSD DPM            : 0.000          LCSD Isotope            :              *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act error | MDA<br>(pCi/GRAM ) |           |
|---------|-------------------------|-----------|--------------------|-----------|
| CO-57   | 2.490E-01               | 5.562E-02 | 5.187E-02          | 0.000E+00 |
| CO-60   | 6.615E+00               | 6.673E-01 | 1.002E-01          | 0.000E+00 |
| CD-109  | 3.129E+01               | 3.447E+00 | 1.242E+00          | 0.000E+00 |
| SN-126  | 3.083E+00               | 3.396E-01 | 1.222E-01          | 0.000E+00 |
| BA-137M | 5.726E+00               | 6.906E-01 | 1.359E-01          | 0.000E+00 |
| CS-137  | 6.049E+00               | 7.302E-01 | 1.436E-01          | 0.000E+00 |
| TL-208  | 3.372E-01               | 1.409E-01 | 1.148E-01          | 0.000E+00 |
| BI-211  | 2.122E+00               | 6.773E-01 | 6.363E-01          | 0.000E+00 |
| PB-212  | 1.118E+00               | 1.728E-01 | 1.553E-01          | 0.000E+00 |
| PB-214  | 7.703E-01               | 2.493E-01 | 2.316E-01          | 0.000E+00 |
| RA-224  | 2.547E+00               | 1.411E+00 | 1.669E+00          | 0.000E+00 |
| TH-228  | 1.118E+00               | 1.728E-01 | 1.553E-01          | 0.000E+00 |
| U-235   | 4.451E-01               | 3.117E-01 | 3.992E-01          | 0.000E+00 |
| NP-237  | 9.198E+00               | 2.145E+00 | 4.054E-01          | 0.000E+00 |
| AM-241  | 1.338E+01               | 1.164E+00 | 1.857E-01          | 0.000E+00 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L. Act error<br>) Ided | MDA<br>(pCi/GRAM ) |                      |
|---------|-------------------------------------|--------------------------|--------------------|----------------------|
| BE-7    | -1.362E-01                          | 6.614E-01                | 1.161E+00          | 0.000E+00 NOT IDENT. |
| NA-22   | -5.265E-02                          | 5.282E-02                | 6.379E-02          | 0.000E+00 NOT IDENT. |
| NA-24   | 0.000E+00                           | 2.350E+03                | 0.000E+00          | 0.000E+00 SHORT HLIF |
| K-40    | 1.284E+00                           | 6.600E-01                | 1.452E+00          | 0.000E+00 NOT IDENT. |
| SC-46   | -3.609E-02                          | 1.015E-01                | 1.717E-01          | 0.000E+00 NOT IDENT. |
| V-48    | -3.411E-02                          | 1.606E-01                | 2.715E-01          | 0.000E+00 NOT IDENT. |
| CR-51   | 3.914E-01                           | 5.649E-01                | 1.024E+00          | 0.000E+00 NOT IDENT. |
| MN-54   | 3.288E-02                           | 9.069E-02                | 1.636E-01          | 0.000E+00 NOT IDENT. |
| CO-56   | -2.877E-02                          | 9.580E-02                | 1.638E-01          | 0.000E+00 NOT IDENT. |
| CO-58   | -4.718E-02                          | 8.879E-02                | 1.493E-01          | 0.000E+00 NOT IDENT. |
| FE-59   | -9.652E-02                          | 2.110E-01                | 3.413E-01          | 0.000E+00 NOT IDENT. |
| ZN-65   | -1.018E-01                          | 2.462E-01                | 4.017E-01          | 0.000E+00 NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| SE-75   | -1.067E-02 | 6.733E-02 | 1.182E-01 | 0.000E+00 | FAIL ABUN  |
| SR-85   | -1.648E-01 | 7.891E-02 | 1.161E-01 | 0.000E+00 | NOT IDENT. |
| Y-88    | 3.418E-02  | 6.250E-02 | 1.190E-01 | 0.000E+00 | NOT IDENT. |
| Y-91    | 1.133E+01  | 3.055E+01 | 5.414E+01 | 0.000E+00 | NOT IDENT. |
| NB-94   | 8.226E-03  | 6.993E-02 | 1.201E-01 | 0.000E+00 | NOT IDENT. |
| NB-95   | 7.417E-03  | 8.915E-02 | 1.509E-01 | 0.000E+00 | NOT IDENT. |
| NB-95M  | -7.008E-02 | 1.963E-01 | 3.080E-01 | 0.000E+00 | NOT IDENT. |
| ZR-95   | -2.586E-02 | 1.547E-01 | 2.558E-01 | 0.000E+00 | NOT IDENT. |
| MO-99   | -9.174E+00 | 7.977E+00 | 1.171E+01 | 0.000E+00 | NOT IDENT. |
| TC-99M  | 0.000E+00  | 2.027E+10 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| RU-103  | 2.942E-03  | 7.266E-02 | 1.291E-01 | 0.000E+00 | NOT IDENT. |
| RH-106  | 2.799E-02  | 6.235E-01 | 1.079E+00 | 0.000E+00 | NOT IDENT. |
| RU-106  | 2.799E-02  | 6.235E-01 | 1.079E+00 | 0.000E+00 | NOT IDENT. |
| AG-108M | -1.784E-02 | 5.985E-02 | 1.056E-01 | 0.000E+00 | NOT IDENT. |
| AG-110M | -3.002E-03 | 8.946E-02 | 1.335E-01 | 0.000E+00 | NOT IDENT. |
| SN-113  | -3.664E-02 | 8.704E-02 | 1.427E-01 | 0.000E+00 | NOT IDENT. |
| CD-115  | -4.437E+00 | 4.344E+00 | 6.942E+00 | 0.000E+00 | NOT IDENT. |
| SN-117M | -1.611E-02 | 5.004E-02 | 9.208E-02 | 0.000E+00 | NOT IDENT. |
| TE-123M | 6.419E-03  | 3.310E-02 | 6.245E-02 | 0.000E+00 | NOT IDENT. |
| SB-124  | -5.121E-02 | 1.318E-01 | 1.964E-01 | 0.000E+00 | NOT IDENT. |
| SB-125  | -8.614E-02 | 1.782E-01 | 3.108E-01 | 0.000E+00 | NOT IDENT. |
| TE-125M | 2.404E+00  | 9.468E+00 | 1.687E+01 | 0.000E+00 | NOT IDENT. |
| I-126   | -3.615E-02 | 4.074E-01 | 6.023E-01 | 0.000E+00 | NOT IDENT. |
| SB-126  | 1.587E-01  | 2.321E-01 | 4.171E-01 | 0.000E+00 | NOT IDENT. |
| SB-127  | 8.523E-01  | 1.109E+00 | 2.014E+00 | 0.000E+00 | NOT IDENT. |
| I-131   | -7.188E-03 | 1.430E-01 | 2.435E-01 | 0.000E+00 | NOT IDENT. |
| TE-132  | 7.632E-02  | 3.400E-01 | 6.198E-01 | 0.000E+00 | FAIL ABUN  |
| BA-133  | 5.813E-02  | 8.632E-02 | 1.396E-01 | 0.000E+00 | NOT IDENT. |
| I-133   | 0.000E+00  | 1.674E+02 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-134  | -1.120E-02 | 1.135E-01 | 1.878E-01 | 0.000E+00 | NOT IDENT. |
| CS-135  | -1.620E-01 | 2.441E-01 | 4.135E-01 | 0.000E+00 | NOT IDENT. |
| I-135   | 0.000E+00  | 1.329E+10 | 0.000E+00 | 0.000E+00 | SHORT HLIF |
| CS-136  | -4.118E-02 | 2.235E-01 | 3.753E-01 | 0.000E+00 | NOT IDENT. |
| CE-139  | 1.255E-02  | 3.800E-02 | 7.180E-02 | 0.000E+00 | NOT IDENT. |
| BA-140  | -3.200E-02 | 4.112E-01 | 7.170E-01 | 0.000E+00 | NOT IDENT. |
| LA-140  | -8.488E-02 | 1.005E-01 | 1.289E-01 | 0.000E+00 | NOT IDENT. |
| CE-141  | -2.132E-02 | 7.344E-02 | 1.122E-01 | 0.000E+00 | NOT IDENT. |
| CE-143  | 2.336E+01  | 1.551E+01 | 2.609E+01 | 0.000E+00 | NOT IDENT. |
| CE-144  | -2.122E-01 | 2.719E-01 | 4.009E-01 | 0.000E+00 | NOT IDENT. |
| PM-144  | -4.182E-02 | 7.965E-02 | 1.289E-01 | 0.000E+00 | NOT IDENT. |
| PR-144  | -3.132E+00 | 5.944E+00 | 9.619E+00 | 0.000E+00 | NOT IDENT. |
| PM-146  | 4.484E-02  | 9.548E-02 | 1.754E-01 | 0.000E+00 | NOT IDENT. |
| ND-147  | 5.434E-01  | 7.884E-01 | 1.454E+00 | 0.000E+00 | NOT IDENT. |
| PM-149  | 4.440E-01  | 2.884E+01 | 5.076E+01 | 0.000E+00 | NOT IDENT. |
| EU-152  | -2.551E-02 | 1.820E-01 | 3.101E-01 | 0.000E+00 | FAIL ABUN  |
| GD-153  | -8.822E-02 | 7.963E-02 | 1.313E-01 | 0.000E+00 | NOT IDENT. |
| EU-154  | -1.366E-01 | 1.448E-01 | 1.757E-01 | 0.000E+00 | FAIL ABUN  |
| EU-155  | 4.733E-02  | 1.126E-01 | 2.030E-01 | 0.000E+00 | FAIL ABUN  |
| TB-160  | -3.682E-01 | 3.459E-01 | 5.453E-01 | 0.000E+00 | FAIL ABUN  |
| HO-166M | 6.122E-02  | 1.389E-01 | 2.445E-01 | 0.000E+00 | FAIL ABUN  |
| TA-182  | 3.633E-02  | 2.562E-01 | 4.393E-01 | 0.000E+00 | NOT IDENT. |
| IR-192  | 1.313E-02  | 6.096E-02 | 1.074E-01 | 0.000E+00 | FAIL ABUN  |
| HG-203  | -3.303E-02 | 5.605E-02 | 9.492E-02 | 0.000E+00 | NOT IDENT. |
| BI-207  | -9.188E-02 | 1.494E-01 | 2.404E-01 | 0.000E+00 | FAIL ABUN  |
| PB-210  | 7.211E-01  | 8.206E-01 | 1.496E+00 | 0.000E+00 | NOT IDENT. |
| PB-211  | 8.208E-02  | 1.516E+00 | 2.567E+00 | 0.000E+00 | NOT IDENT. |
| BI-212  | 1.949E+00  | 1.162E+00 | 2.061E+00 | 0.000E+00 | FAIL ABUN  |
| BI-214  | 0.000E+00  | 2.712E-01 | 4.080E-01 | 0.000E+00 | FAIL ABUN  |
| RN-219  | 8.226E-01  | 8.375E-01 | 1.501E+00 | 0.000E+00 | NOT IDENT. |
| RA-223  | -3.893E-02 | 1.117E+00 | 1.931E+00 | 0.000E+00 | FAIL ABUN  |
| RA-226  | 0.000E+00  | 2.712E-01 | 4.080E-01 | 0.000E+00 | FAIL ABUN  |
| AC-227  | 7.201E-02  | 4.092E-01 | 7.354E-01 | 0.000E+00 | NOT IDENT. |
| TH-227  | 7.201E-02  | 4.092E-01 | 7.354E-01 | 0.000E+00 | NOT IDENT. |
| AC-228  | 0.000E+00  | 8.781E-01 | 9.419E-01 | 0.000E+00 | FAIL ABUN  |
| RA-228  | 0.000E+00  | 8.781E-01 | 9.419E-01 | 0.000E+00 | FAIL ABUN  |
| TH-229  | -5.290E-01 | 7.086E-01 | 1.247E+00 | 0.000E+00 | FAIL ABUN  |
| PA-231  | 1.179E+00  | 2.356E+00 | 4.266E+00 | 0.000E+00 | NOT IDENT. |
| TH-231  | -3.893E-02 | 1.117E+00 | 1.931E+00 | 0.000E+00 | FAIL ABUN  |
| TH-232  | 0.000E+00  | 8.781E-01 | 9.419E-01 | 0.000E+00 | FAIL ABUN  |
| PA-233  | -7.594E-02 | 1.141E-01 | 1.894E-01 | 0.000E+00 | NOT IDENT. |
| PA-234  | -2.210E-01 | 9.594E-01 | 1.630E+00 | 0.000E+00 | NOT IDENT. |
| PA-234M | 1.068E+01  | 1.190E+01 | 2.191E+01 | 0.000E+00 | NOT IDENT. |
| TH-234  | 3.815E-01  | 6.598E-01 | 1.245E+00 | 0.000E+00 | FAIL ABUN  |
| U-238   | 3.815E-01  | 6.598E-01 | 1.245E+00 | 0.000E+00 | FAIL ABUN  |
| NP-239  | -2.122E-01 | 4.384E-01 | 7.393E-01 | 0.000E+00 | NOT IDENT. |
| CM-247  | 2.362E-02  | 7.858E-02 | 1.355E-01 | 0.000E+00 | NOT IDENT. |
| CF-249  | 1.868E-02  | 7.574E-02 | 1.309E-01 | 0.000E+00 | NOT IDENT. |
| CF-251  | 4.634E-02  | 1.628E-01 | 3.054E-01 | 0.000E+00 | NOT IDENT. |

|         |           |           |           |                      |
|---------|-----------|-----------|-----------|----------------------|
| ANH-511 | 5.354E-02 | 7.197E-02 | 1.416E-01 | 0.000E+00 NOT IDENT. |
|---------|-----------|-----------|-----------|----------------------|

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29414                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054950.CNF;1
Sample date        : 2-MAR-2010 00:00:00. Acquisition date : 11-MAR-2010 19:35:21
Sample ID          : G1202054950      Sample quantity   : 1.55440E+02 GRAM
Detector name      : GAM21            Detector geometry: CAN
Elapsed live time  : 0 01:00:00.00    Elapsed real time: 0 01:00:14.04  0.4%
Energy tolerance   : 1.50000 keV      Analyst Initials  : MXR1
Abundance limit    : 75.00000         Sensitivity       : 5.00000
Batch ID           : 958216           Detector SN#      :
Matrix Spike ID    :                  LCS ID            : 1032-A
*****

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## Nuclide Line Activity Report

## Nuclide Type:

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|-------------------------|------------------------|-------------------|
| CO-57   | 122.06  | 311   | 85.60* | 7.221E+00 | 2.428E-01               | 2.490E-01              | 22.79             |
|         | 136.47  | ----- | 10.68  | 6.782E+00 | -----                   | Line Not Found         | -----             |
| CO-60   | 1173.23 | 1191  | 99.85  | 8.894E-01 | 6.479E+00               | 6.502E+00              | 10.29             |
|         | 1332.49 | 1074  | 99.98* | 7.871E-01 | 6.592E+00               | 6.615E+00              | 10.29             |
| CD-109  | 88.03   | 1918  | 3.70*  | 8.123E+00 | 3.083E+01               | 3.129E+01              | 11.24             |
| SN-126  | 64.28   | ----- | 9.60   | 8.201E+00 | -----                   | Line Not Found         | -----             |
|         | 86.94   | 1918  | 8.90   | 8.123E+00 | 1.282E+01               | 1.282E+01              | 41.98             |
|         | 87.57   | 1918  | 37.00* | 8.123E+00 | 3.083E+00               | 3.083E+00              | 11.24             |
| BA-137M | 661.66  | 1664  | 89.90* | 1.563E+00 | 5.722E+00               | 5.726E+00              | 12.31             |
| CS-137  | 661.66  | 1664  | 85.10* | 1.563E+00 | 6.045E+00               | 6.049E+00              | 12.32             |
| TL-208  | 277.37  | ----- | 6.60   | 3.801E+00 | -----                   | Line Not Found         | -----             |
|         | 583.19  | 105   | 85.00* | 1.778E+00 | 3.372E-01               | 3.372E-01              | 42.65             |
|         | 860.56  | 46    | 12.50  | 1.201E+00 | 1.480E+00               | 1.480E+00              | 64.22             |
| BI-211  | 72.87   | ----- | 1.23   | 8.278E+00 | -----                   | Line Not Found         | -----             |
|         | 351.06  | 170   | 12.92* | 2.997E+00 | 2.122E+00               | 2.122E+00              | 32.56             |
| PB-212  | 74.82   | 226   | 10.28  | 8.275E+00 | 1.283E+00               | 1.283E+00              | 30.11             |
|         | 77.11   | 405   | 17.10  | 8.264E+00 | 1.385E+00               | 1.385E+00              | 18.42             |
|         | 238.63  | 443   | 43.60* | 4.387E+00 | 1.118E+00               | 1.118E+00              | 15.77             |
|         | 300.09  | ----- | 3.30   | 3.518E+00 | -----                   | Line Not Found         | -----             |
| PB-214  | 74.82   | 226   | 5.80   | 8.275E+00 | 2.275E+00               | 2.275E+00              | 29.58             |
|         | 77.11   | 405   | 9.70   | 8.264E+00 | 2.442E+00               | 2.442E+00              | 20.18             |
|         | 242.00  | 94    | 7.25   | 4.336E+00 | 1.440E+00               | 1.440E+00              | 56.82             |
|         | 295.22  | 108   | 18.42  | 3.579E+00 | 7.941E-01               | 7.941E-01              | 50.99             |
|         | 351.93  | 170   | 35.60* | 2.997E+00 | 7.703E-01               | 7.703E-01              | 33.02             |
| RA-224  | 240.99  | 94    | 4.10*  | 4.336E+00 | 2.547E+00               | 2.547E+00              | 56.53             |
| TH-228  | 74.82   | 226   | 10.28  | 8.275E+00 | 1.283E+00               | 1.283E+00              | 28.52             |
|         | 77.11   | 405   | 17.10  | 8.264E+00 | 1.385E+00               | 1.385E+00              | 18.42             |
|         | 238.63  | 443   | 43.60* | 4.387E+00 | 1.118E+00               | 1.118E+00              | 15.77             |
|         | 300.09  | ----- | 3.30   | 3.518E+00 | -----                   | Line Not Found         | -----             |
| U-235   | 89.96   | ----- | 3.47   | 8.084E+00 | -----                   | Line Not Found         | -----             |
|         | 93.35   | 165   | 5.60   | 8.022E+00 | 1.769E+00               | 1.769E+00              | 44.94             |
|         | 143.76  | 66    | 10.96* | 6.567E+00 | 4.451E-01               | 4.451E-01              | 71.46             |

Nuclide Type:

| Nuclide | Energy | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | 2-Sigma<br>%Error |
|---------|--------|-------|--------|-----------|-------------------------|------------------------|-------------------|
|         | 163.33 | ----- | 5.08   | 6.017E+00 | -----                   | Line Not Found         | -----             |
|         | 185.72 | 80    | 57.20  | 5.454E+00 | 1.239E-01               | 1.239E-01              | 72.80             |
|         | 205.31 | ----- | 5.01   | 5.015E+00 | -----                   | Line Not Found         | -----             |
| NP-237  | 86.48  | 1918  | 12.40* | 8.123E+00 | 9.198E+00               | 9.198E+00              | 23.79             |
|         | 95.86  | ----- | 2.68   | 7.953E+00 | -----                   | Line Not Found         | -----             |
| AM-241  | 59.54  | 8039  | 35.90* | 8.083E+00 | 1.338E+01               | 1.338E+01              | 8.88              |

Flag: "\*" = Keyline

Total number of lines in spectrum 24  
Number of unidentified lines 1  
Number of lines tentatively identified by NID 23 95.83%

Nuclide Type :

| Nuclide | Hlife     | Decay | Uncorrected<br>pCi/GRAM | Decay Corr<br>pCi/GRAM | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|-------|-------------------------|------------------------|-----------------------------|-------------------|-------|
| CO-57   | 271.74D   | 1.03  | 2.428E-01               | 2.490E-01              | 0.568E-01                   | 22.79             |       |
| CO-60   | 5.27Y     | 1.00  | 6.592E+00               | 6.615E+00              | 0.681E+00                   | 10.29             |       |
| CD-109  | 461.40D   | 1.01  | 3.083E+01               | 3.129E+01              | 0.352E+01                   | 11.24             |       |
| SN-126  | 2.30E+05Y | 1.00  | 3.083E+00               | 3.083E+00              | 0.347E+00                   | 11.24             |       |
| BA-137M | 30.08Y    | 1.00  | 5.722E+00               | 5.726E+00              | 0.705E+00                   | 12.31             |       |
| CS-137  | 30.08Y    | 1.00  | 6.045E+00               | 6.049E+00              | 0.745E+00                   | 12.32             |       |
| TL-208  | 1.41E+10Y | 1.00  | 3.372E-01               | 3.372E-01              | 1.438E-01                   | 42.65             |       |
| BI-211  | 7.04E+08Y | 1.00  | 2.122E+00               | 2.122E+00              | 0.691E+00                   | 32.56             |       |
| PB-212  | 1.41E+10Y | 1.00  | 1.118E+00               | 1.118E+00              | 0.176E+00                   | 15.77             |       |
| PB-214  | 1600.00Y  | 1.00  | 7.703E-01               | 7.703E-01              | 2.544E-01                   | 33.02             |       |
| RA-224  | 1.41E+10Y | 1.00  | 2.547E+00               | 2.547E+00              | 1.440E+00                   | 56.53             |       |
| TH-228  | 1.41E+10Y | 1.00  | 1.118E+00               | 1.118E+00              | 0.176E+00                   | 15.77             |       |
| U-235   | 7.04E+08Y | 1.00  | 4.451E-01               | 4.451E-01              | 3.180E-01                   | 71.46             |       |
| NP-237  | 2.14E+06Y | 1.00  | 9.198E+00               | 9.198E+00              | 2.188E+00                   | 23.79             |       |
| AM-241  | 432.60Y   | 1.00  | 1.338E+01               | 1.338E+01              | 0.119E+01                   | 8.88              |       |

Total Activity : 8.355E+01 8.405E+01

Grand Total Activity : 8.355E+01 8.405E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : G1202054950

Page : 4  
Acquisition date : 11-MAR-2010 19:35:21

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 49.25  | 150  | 999   | 1.33 | 98.48   | 95   | 7  | 4.17E-02 | 71.5 | 7.56E+00 | T     |
| 0  | 129.36 | 64   | 298   | 1.00 | 258.62  | 255  | 9  | 1.79E-02 | 99.6 | 7.00E+00 |       |
| 0  | 209.50 | 65   | 294   | 0.95 | 418.84  | 414  | 11 | 1.81E-02 | **** | 4.93E+00 | T     |
| 0  | 338.79 | 43   | 139   | 0.74 | 677.34  | 673  | 8  | 1.18E-02 | **** | 3.11E+00 | T     |
| 0  | 608.71 | 151  | 63    | 1.48 | 1217.10 | 1211 | 12 | 4.18E-02 | 26.9 | 1.70E+00 | T     |
| 0  | 727.04 | 38   | 30    | 1.40 | 1453.78 | 1450 | 8  | 1.06E-02 | 59.2 | 1.42E+00 | T     |
| 0  | 911.43 | 120  | 94    | 2.02 | 1822.64 | 1814 | 20 | 3.32E-02 | 43.9 | 1.14E+00 | T     |

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC
*                                     2040 Savage Road
*                                     Charleston, SC 29414
*****
*
*                               DETECTOR DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1202054950.CNF;1
* Acquisition date   : 11-MAR-2010 19:35:21   Detector SN#      :
* Detector ID        : GAM21                   Sensitivity       : 5.00000
* Geometry           : CAN                     Energy tolerance: 1.50000
* Elapsed live time  : 0 01:00:00.00           Abundance limit  : 75.00000
* Elapsed real time  : 0 01:00:14.04           Half life ratio  : 8.00000
*****
*
*                               SAMPLE DATA
*
* Sample date        : 2-MAR-2010 00:00:00.   Nuclide Library : SOLID
* Sample ID          : G1202054950           Analyst initials: MXR1
* Batch Number       : 958216                Sample Quantity : 1.55440E+02 GRAM
*****
*
*                               QC DATA
*
* CALIB. DATE/TIME   : 28-JUL-2009 10:09:51.9MS Isotope      :
* MSD ID             :                      MSD Isotope      :
* LCS ID             : 1032-A               LCS Isotope      :
*****

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## Combined Activity-MDA Report

## ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM) | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------|-----------|-------------------|-----------|---------|
| CO-57   | 2.490E-01              | 5.675E-02 | 4.816E-02         | 5.533E-03 | 5.171   |
| CO-60   | 6.615E+00              | 6.809E-01 | 9.913E-02         | 8.046E-03 | 66.727  |
| CD-109  | 3.129E+01              | 3.517E+00 | 1.144E+00         | 1.076E-01 | 27.353  |
| SN-126  | 3.083E+00              | 3.466E-01 | 1.125E-01         | 1.055E-02 | 27.402  |
| BA-137M | 5.726E+00              | 7.047E-01 | 1.318E-01         | 1.456E-02 | 43.436  |
| CS-137  | 6.049E+00              | 7.451E-01 | 1.393E-01         | 1.540E-02 | 43.436  |
| TL-208  | 3.372E-01              | 1.438E-01 | 1.110E-01         | 1.208E-02 | 3.039   |
| BI-211  | 2.122E+00              | 6.911E-01 | 6.069E-01         | 5.479E-02 | 3.497   |
| PB-212  | 1.118E+00              | 1.763E-01 | 1.466E-01         | 1.465E-02 | 7.624   |
| PB-214  | 7.703E-01              | 2.544E-01 | 2.209E-01         | 2.335E-02 | 3.487   |
| RA-224  | 2.547E+00              | 1.440E+00 | 1.576E+00         | 1.401E-01 | 1.616   |
| TH-228  | 1.118E+00              | 1.763E-01 | 1.466E-01         | 1.465E-02 | 7.624   |
| U-235   | 4.451E-01              | 3.180E-01 | 3.721E-01         | 6.589E-02 | 1.196   |
| NP-237  | 9.198E+00              | 2.188E+00 | 3.732E-01         | 8.558E-02 | 24.648  |
| AM-241  | 1.338E+01              | 1.188E+00 | 1.694E-01         | 1.437E-02 | 78.992  |

## ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity K.L.<br>(pCi/GRAM) Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|--|-----------|-------------------|-----------|---------|
| BE-7    | -1.362E-01                                   | 6.749E-01 | 1.116E+00         | 1.094E-01 | -0.122  |



----- Non-Identified Nuclides -----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM)   | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|---------------------|-----------|---------|
| NA-22   | -5.265E-02                         |              | 5.390E-02 | 6.301E-02           | 5.169E-03 | -0.836  |
| NA-24   | -7.890E-04                         |              | 1.199E-03 | Half-Life too short |           |         |
| K-40    | 1.284E+00                          |              | 6.735E-01 | 1.440E+00           | 1.229E-01 | 0.891   |
| SC-46   | -3.609E-02                         |              | 1.036E-01 | 1.679E-01           | 1.493E-02 | -0.215  |
| V-48    | -3.411E-02                         |              | 1.639E-01 | 2.662E-01           | 2.329E-02 | -0.128  |
| CR-51   | 3.914E-01                          |              | 5.764E-01 | 9.742E-01           | 9.050E-02 | 0.402   |
| MN-54   | 3.288E-02                          |              | 9.254E-02 | 1.597E-01           | 1.548E-02 | 0.206   |
| CO-56   | -2.877E-02                         |              | 9.775E-02 | 1.600E-01           | 1.525E-02 | -0.180  |
| CO-58   | -4.718E-02                         |              | 9.060E-02 | 1.456E-01           | 1.457E-02 | -0.324  |
| FE-59   | -9.652E-02                         |              | 2.153E-01 | 3.357E-01           | 3.097E-02 | -0.288  |
| ZN-65   | -1.018E-01                         |              | 2.512E-01 | 3.953E-01           | 3.351E-02 | -0.258  |
| SE-75   | -1.067E-02                         |              | 6.870E-02 | 1.119E-01           | 1.005E-02 | -0.095  |
| SR-85   | -1.648E-01                         |              | 8.052E-02 | 1.118E-01           | 1.076E-02 | -1.474  |
| Y-88    | 3.418E-02                          |              | 6.378E-02 | 1.188E-01           | 9.808E-03 | 0.288   |
| Y-91    | 1.133E+01                          |              | 3.117E+01 | 5.339E+01           | 4.398E+00 | 0.212   |
| NB-94   | 8.226E-03                          |              | 7.135E-02 | 1.166E-01           | 1.270E-02 | 0.071   |
| NB-95   | 7.417E-03                          |              | 9.097E-02 | 1.469E-01           | 1.535E-02 | 0.050   |
| NB-95M  | -7.008E-02                         |              | 2.003E-01 | 2.907E-01           | 2.935E-02 | -0.241  |
| ZR-95   | -2.586E-02                         |              | 1.579E-01 | 2.491E-01           | 2.809E-02 | -0.104  |
| MO-99   | -9.174E+00                         |              | 8.139E+00 | 1.139E+01           | 1.932E+00 | -0.805  |
| TC-99M  | 1.590E+04                          |              | 1.034E+04 | Half-Life too short |           |         |
| RU-103  | 2.942E-03                          |              | 7.415E-02 | 1.243E-01           | 1.798E-02 | 0.024   |
| RH-106  | 2.799E-02                          |              | 6.362E-01 | 1.045E+00           | 1.538E-01 | 0.027   |
| RU-106  | 2.799E-02                          |              | 6.362E-01 | 1.045E+00           | 1.122E-01 | 0.027   |
| AG-108M | -1.784E-02                         |              | 6.107E-02 | 1.013E-01           | 8.966E-03 | -0.176  |
| AG-110M | -3.002E-03                         |              | 9.129E-02 | 1.295E-01           | 1.452E-02 | -0.023  |
| SN-113  | -3.664E-02                         |              | 8.881E-02 | 1.365E-01           | 1.124E-02 | -0.268  |
| CD-115  | -4.437E+00                         |              | 4.432E+00 | 6.693E+00           | 6.549E-01 | -0.663  |
| SN-117M | -1.611E-02                         |              | 5.106E-02 | 8.605E-02           | 7.575E-03 | -0.187  |
| TE-123M | 6.419E-03                          |              | 3.377E-02 | 5.837E-02           | 5.145E-03 | 0.110   |
| SB-124  | -5.121E-02                         |              | 1.345E-01 | 1.956E-01           | 1.707E-02 | -0.262  |
| SB-125  | -8.614E-02                         |              | 1.818E-01 | 2.980E-01           | 2.577E-02 | -0.289  |
| TE-125M | 2.404E+00                          |              | 9.661E+00 | 1.562E+01           | 1.897E+00 | 0.154   |
| I-126   | -3.615E-02                         |              | 4.157E-01 | 5.843E-01           | 6.446E-02 | -0.062  |
| SB-126  | 1.587E-01                          |              | 2.368E-01 | 4.056E-01           | 4.376E-02 | 0.391   |
| SB-127  | 8.523E-01                          |              | 1.132E+00 | 1.955E+00           | 2.364E-01 | 0.436   |
| I-131   | -7.188E-03                         |              | 1.460E-01 | 2.325E-01           | 2.060E-02 | -0.031  |
| TE-132  | 7.632E-02                          |              | 3.469E-01 | 5.846E-01           | 8.799E-02 | 0.131   |
| BA-133  | 5.813E-02                          |              | 8.808E-02 | 1.332E-01           | 1.717E-02 | 0.437   |
| I-133   | -5.548E-05                         |              | 8.541E-05 | Half-Life too short |           |         |
| CS-134  | -1.120E-02                         |              | 1.158E-01 | 1.831E-01           | 1.869E-02 | -0.061  |
| CS-135  | -1.620E-01                         |              | 2.491E-01 | 3.917E-01           | 4.011E-02 | -0.414  |
| I-135   | -4.489E+03                         |              | 6.782E+03 | Half-Life too short |           |         |
| CS-136  | -4.118E-02                         |              | 2.281E-01 | 3.687E-01           | 3.322E-02 | -0.112  |
| CE-139  | 1.255E-02                          |              | 3.877E-02 | 6.717E-02           | 5.460E-03 | 0.187   |
| BA-140  | -3.200E-02                         |              | 4.196E-01 | 6.916E-01           | 2.369E-01 | -0.046  |
| LA-140  | -8.488E-02                         |              | 1.026E-01 | 1.281E-01           | 1.072E-02 | -0.662  |
| CE-141  | -2.132E-02                         |              | 7.494E-02 | 1.046E-01           | 1.049E-02 | -0.204  |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM) | K.L.<br>Ided | Act error | MDA<br>(pCi/GRAM) | MDA error | Act/MDA |
|---------|------------------------------------|--------------|-----------|-------------------|-----------|---------|
| CE-143  | 2.336E+01                          |              | 1.582E+01 | 2.477E+01         | 5.341E+00 | 0.943   |
| CE-144  | -2.122E-01                         |              | 2.775E-01 | 3.731E-01         | 6.186E-02 | -0.569  |
| PM-144  | -4.182E-02                         |              | 8.128E-02 | 1.252E-01         | 1.368E-02 | -0.334  |
| PR-144  | -3.132E+00                         |              | 6.065E+00 | 9.344E+00         | 1.020E+00 | -0.335  |
| PM-146  | 4.484E-02                          |              | 9.743E-02 | 1.684E-01         | 1.815E-02 | 0.266   |
| ND-147  | 5.434E-01                          |              | 8.045E-01 | 1.403E+00         | 2.198E-01 | 0.387   |
| PM-149  | 4.440E-01                          |              | 2.943E+01 | 4.815E+01         | 7.560E+00 | 0.009   |
| EU-152  | -2.551E-02                         |              | 1.857E-01 | 2.956E-01         | 2.710E-02 | -0.086  |
| GD-153  | -8.822E-02                         |              | 8.125E-02 | 1.212E-01         | 1.198E-02 | -0.728  |
| EU-154  | -1.366E-01                         |              | 1.477E-01 | 1.735E-01         | 1.919E-02 | -0.787  |
| EU-155  | 4.733E-02                          |              | 1.149E-01 | 1.878E-01         | 1.958E-02 | 0.252   |
| TB-160  | -3.682E-01                         |              | 3.529E-01 | 5.331E-01         | 4.825E-02 | -0.691  |
| HO-166M | 6.122E-02                          |              | 1.418E-01 | 2.377E-01         | 2.577E-02 | 0.258   |
| TA-182  | 3.633E-02                          |              | 2.615E-01 | 4.334E-01         | 3.568E-02 | 0.084   |
| IR-192  | 1.313E-02                          |              | 6.220E-02 | 1.021E-01         | 9.076E-03 | 0.129   |
| HG-203  | -3.303E-02                         |              | 5.720E-02 | 9.000E-02         | 8.216E-03 | -0.367  |
| BI-207  | -9.188E-02                         |              | 1.525E-01 | 2.362E-01         | 2.036E-02 | -0.389  |
| PB-210  | 7.211E-01                          |              | 8.373E-01 | 1.357E+00         | 1.283E-01 | 0.531   |
| PB-211  | 8.208E-02                          |              | 1.547E+00 | 2.458E+00         | 1.187E+00 | 0.033   |
| BI-212  | 1.949E+00                          | +            | 1.186E+00 | 2.005E+00         | 2.810E-01 | 0.972   |
| BI-214  | 9.401E-01                          | +            | 2.767E-01 | 3.949E-01         | 4.683E-02 | 2.380   |
| RN-219  | 8.226E-01                          |              | 8.545E-01 | 1.436E+00         | 2.094E-01 | 0.573   |
| RA-223  | -3.893E-02                         |              | 1.140E+00 | 1.838E+00         | 3.205E-01 | -0.021  |
| RA-226  | 9.401E-01                          | +            | 2.767E-01 | 3.949E-01         | 4.683E-02 | 2.380   |
| AC-227  | 7.201E-02                          |              | 4.175E-01 | 6.957E-01         | 8.540E-02 | 0.104   |
| TH-227  | 7.201E-02                          |              | 4.175E-01 | 6.957E-01         | 9.604E-02 | 0.104   |
| AC-228  | 1.972E+00                          | +            | 8.960E-01 | 9.217E-01         | 1.078E-01 | 2.139   |
| RA-228  | 1.972E+00                          | +            | 8.960E-01 | 9.217E-01         | 1.078E-01 | 2.139   |
| TH-229  | -5.290E-01                         |              | 7.231E-01 | 1.171E+00         | 9.940E-02 | -0.452  |
| PA-231  | 1.179E+00                          |              | 2.405E+00 | 4.046E+00         | 5.975E-01 | 0.291   |
| TH-231  | -3.893E-02                         |              | 1.140E+00 | 1.838E+00         | 3.205E-01 | -0.021  |
| TH-232  | 1.972E+00                          | +            | 8.960E-01 | 9.217E-01         | 1.078E-01 | 2.139   |
| PA-233  | -7.594E-02                         |              | 1.165E-01 | 1.801E-01         | 1.644E-02 | -0.422  |
| PA-234  | -2.210E-01                         |              | 9.789E-01 | 1.597E+00         | 3.007E-01 | -0.138  |
| PA-234M | 1.068E+01                          |              | 1.214E+01 | 2.150E+01         | 2.163E+00 | 0.497   |
| TH-234  | 3.815E-01                          |              | 6.732E-01 | 1.137E+00         | 2.053E-01 | 0.335   |
| U-238   | 3.815E-01                          |              | 6.732E-01 | 1.137E+00         | 2.053E-01 | 0.335   |
| NP-239  | -2.122E-01                         |              | 4.473E-01 | 6.858E-01         | 7.633E-02 | -0.309  |
| CM-247  | 2.362E-02                          |              | 8.018E-02 | 1.297E-01         | 1.052E-02 | 0.182   |
| CF-249  | 1.868E-02                          |              | 7.728E-02 | 1.252E-01         | 1.003E-02 | 0.149   |
| CF-251  | 4.634E-02                          |              | 1.662E-01 | 2.862E-01         | 2.372E-02 | 0.162   |
| ANH-511 | 5.354E-02                          |              | 7.344E-02 | 1.364E-01         | 1.308E-02 | 0.392   |

# VAX/VMS Nuclide Identification Report Generated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29414                     *
*****
*
*                                     DETECTOR DATA                          *
*
* Configuration      : SYS$SYSROOT:[ALPHA.ARCHIVE.GAMMA]G1202054950          *
* Acquisition date   : 11-MAR-2010 19:35:21 Detector SN# :                  *
* Detector ID        : GAM21 Sensitivity      : 5.000                      *
* Geometry           : CAN Energy tolerance: 1.500                        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000             *
* Elapsed real time  : 0 01:00:14.04 Half life ratio : 8.000              *
*****
*
*                                     SAMPLE DATA                            *
*
* Sample date       : 2-MAR-2010 00:00:00 Nuclide Library : SOLID           *
* Sample ID         : G1202054950 Analyst initials: MXR1                  *
* Batch Number      : 958216 Sample Quantity : 1.5544E+02 GRAM            *
* Recovery          : 1.00000 Carrier Weight : 0.00000                   *
*****
*
*                                     QC DATA                               *
*
* CALIB. DATE/TIME  : 28-JUL-2009 10:09:51 MS Isotope :                   *
* MSD DPM           : 0.000 MSD Isotope :                               *
* LCS DPM           : 0.000 LCS Isotope :                               *
* LCSD DPM          : 0.000 LCSD Isotope :                               *
*****

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## Combined Activity-MDA Report

### ---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/GRAM ) | Act Error | DLC<br>(pCi/GRAM ) | TPU       |
|---------|-------------------------|-----------|--------------------|-----------|
| CO-57   | 2.490E-01               | 5.562E-02 | 2.595E-02          | 2.838E-02 |
| CO-60   | 6.615E+00               | 6.673E-01 | 5.015E-02          | 3.404E-01 |
| CD-109  | 3.129E+01               | 3.447E+00 | 6.213E-01          | 1.759E+00 |
| SN-126  | 3.083E+00               | 3.396E-01 | 6.112E-02          | 1.733E-01 |
| BA-137M | 5.726E+00               | 6.906E-01 | 6.799E-02          | 3.523E-01 |
| CS-137  | 6.049E+00               | 7.302E-01 | 7.182E-02          | 3.726E-01 |
| TL-208  | 3.372E-01               | 1.409E-01 | 5.742E-02          | 7.190E-02 |
| BI-211  | 2.122E+00               | 6.773E-01 | 3.183E-01          | 3.455E-01 |
| PB-212  | 1.118E+00               | 1.728E-01 | 7.769E-02          | 8.816E-02 |
| PB-214  | 7.703E-01               | 2.493E-01 | 1.159E-01          | 1.272E-01 |
| RA-224  | 2.547E+00               | 1.411E+00 | 8.349E-01          | 7.198E-01 |
| TH-228  | 1.118E+00               | 1.728E-01 | 7.769E-02          | 8.816E-02 |
| U-235   | 4.451E-01               | 3.117E-01 | 1.997E-01          | 1.590E-01 |
| NP-237  | 9.198E+00               | 2.145E+00 | 2.028E-01          | 1.094E+00 |
| AM-241  | 1.338E+01               | 1.164E+00 | 9.290E-02          | 5.938E-01 |

### ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/GRAM ) | K.L Act error | DLC<br>(pCi/GRAM ) | TPU       |            |
|---------|-------------------------------------|---------------|--------------------|-----------|------------|
| BE-7    | -1.362E-01                          | 6.614E-01     | 5.809E-01          | 3.375E-01 | NOT IDENT. |
| NA-22   | -5.265E-02                          | 5.282E-02     | 3.192E-02          | 2.695E-02 | NOT IDENT. |
| NA-24   | -7.890E+02                          | 2.350E+03     | 0.000E+00          | 1.199E+03 | SHORT HLIF |
| K-40    | 1.284E+00                           | 6.600E-01     | 7.266E-01          | 3.368E-01 | NOT IDENT. |
| SC-46   | -3.609E-02                          | 1.015E-01     | 8.590E-02          | 5.179E-02 | NOT IDENT. |
| V-48    | -3.411E-02                          | 1.606E-01     | 1.358E-01          | 8.194E-02 | NOT IDENT. |
| CR-51   | 3.914E-01                           | 5.649E-01     | 5.122E-01          | 2.882E-01 | NOT IDENT. |
| MN-54   | 3.288E-02                           | 9.069E-02     | 8.185E-02          | 4.627E-02 | NOT IDENT. |
| CO-56   | -2.877E-02                          | 9.580E-02     | 8.196E-02          | 4.888E-02 | NOT IDENT. |
| CO-58   | -4.718E-02                          | 8.879E-02     | 7.469E-02          | 4.530E-02 | NOT IDENT. |
| FE-59   | -9.652E-02                          | 2.110E-01     | 1.707E-01          | 1.077E-01 | NOT IDENT. |
| ZN-65   | -1.018E-01                          | 2.462E-01     | 2.010E-01          | 1.256E-01 | NOT IDENT. |

|         |            |           |           |           |            |
|---------|------------|-----------|-----------|-----------|------------|
| SE-75   | -1.067E-02 | 6.733E-02 | 5.914E-02 | 3.435E-02 | FAIL ABUN  |
| SR-85   | -1.648E-01 | 7.891E-02 | 5.806E-02 | 4.026E-02 | NOT IDENT. |
| Y-88    | 3.418E-02  | 6.250E-02 | 5.955E-02 | 3.189E-02 | NOT IDENT. |
| Y-91    | 1.133E+01  | 3.055E+01 | 2.708E+01 | 1.558E+01 | NOT IDENT. |
| NB-94   | 8.226E-03  | 6.993E-02 | 6.006E-02 | 3.568E-02 | NOT IDENT. |
| NB-95   | 7.417E-03  | 8.915E-02 | 7.548E-02 | 4.549E-02 | NOT IDENT. |
| NB-95M  | -7.008E-02 | 1.963E-01 | 1.541E-01 | 1.001E-01 | NOT IDENT. |
| ZR-95   | -2.586E-02 | 1.547E-01 | 1.280E-01 | 7.895E-02 | NOT IDENT. |
| MO-99   | -9.174E+00 | 7.977E+00 | 5.858E+00 | 4.070E+00 | NOT IDENT. |
| TC-99M  | 1.590E+10  | 2.027E+10 | 0.000E+00 | 1.034E+10 | SHORT HLIF |
| RU-103  | 2.942E-03  | 7.266E-02 | 6.458E-02 | 3.707E-02 | NOT IDENT. |
| RH-106  | 2.799E-02  | 6.235E-01 | 5.400E-01 | 3.181E-01 | NOT IDENT. |
| RU-106  | 2.799E-02  | 6.235E-01 | 5.400E-01 | 3.181E-01 | NOT IDENT. |
| AG-108M | -1.784E-02 | 5.985E-02 | 5.283E-02 | 3.054E-02 | NOT IDENT. |
| AG-110M | -3.002E-03 | 8.946E-02 | 6.678E-02 | 4.564E-02 | NOT IDENT. |
| SN-113  | -3.664E-02 | 8.704E-02 | 7.138E-02 | 4.441E-02 | NOT IDENT. |
| CD-115  | -4.437E+00 | 4.344E+00 | 3.473E+00 | 2.216E+00 | NOT IDENT. |
| SN-117M | -1.611E-02 | 5.004E-02 | 4.607E-02 | 2.553E-02 | NOT IDENT. |
| TE-123M | 6.419E-03  | 3.310E-02 | 3.124E-02 | 1.689E-02 | NOT IDENT. |
| SB-124  | -5.121E-02 | 1.318E-01 | 9.828E-02 | 6.727E-02 | NOT IDENT. |
| SB-125  | -8.614E-02 | 1.782E-01 | 1.555E-01 | 9.091E-02 | NOT IDENT. |
| TE-125M | 2.404E+00  | 9.468E+00 | 8.440E+00 | 4.831E+00 | NOT IDENT. |
| I-126   | -3.615E-02 | 4.074E-01 | 3.013E-01 | 2.079E-01 | NOT IDENT. |
| SB-126  | 1.587E-01  | 2.321E-01 | 2.087E-01 | 1.184E-01 | NOT IDENT. |
| SB-127  | 8.523E-01  | 1.109E+00 | 1.007E+00 | 5.660E-01 | NOT IDENT. |
| I-131   | -7.188E-03 | 1.430E-01 | 1.218E-01 | 7.298E-02 | NOT IDENT. |
| TE-132  | 7.632E-02  | 3.400E-01 | 3.101E-01 | 1.735E-01 | FAIL ABUN  |
| BA-133  | 5.813E-02  | 8.632E-02 | 6.982E-02 | 4.404E-02 | NOT IDENT. |
| I-133   | -5.548E+01 | 1.674E+02 | 0.000E+00 | 8.541E+01 | SHORT HLIF |
| CS-134  | -1.120E-02 | 1.135E-01 | 9.397E-02 | 5.790E-02 | NOT IDENT. |
| CS-135  | -1.620E-01 | 2.441E-01 | 2.069E-01 | 1.245E-01 | NOT IDENT. |
| I-135   | -4.489E+09 | 1.329E+10 | 0.000E+00 | 6.782E+09 | SHORT HLIF |
| CS-136  | -4.118E-02 | 2.235E-01 | 1.878E-01 | 1.141E-01 | NOT IDENT. |
| CE-139  | 1.255E-02  | 3.800E-02 | 3.592E-02 | 1.939E-02 | NOT IDENT. |
| BA-140  | -3.200E-02 | 4.112E-01 | 3.587E-01 | 2.098E-01 | NOT IDENT. |
| LA-140  | -8.488E-02 | 1.005E-01 | 6.449E-02 | 5.128E-02 | NOT IDENT. |
| CE-141  | -2.132E-02 | 7.344E-02 | 5.613E-02 | 3.747E-02 | NOT IDENT. |
| CE-143  | 2.336E+01  | 1.551E+01 | 1.305E+01 | 7.911E+00 | NOT IDENT. |
| CE-144  | -2.122E-01 | 2.719E-01 | 2.006E-01 | 1.387E-01 | NOT IDENT. |
| PM-144  | -4.182E-02 | 7.965E-02 | 6.450E-02 | 4.064E-02 | NOT IDENT. |
| PR-144  | -3.132E+00 | 5.944E+00 | 4.812E+00 | 3.033E+00 | NOT IDENT. |
| PM-146  | 4.484E-02  | 9.548E-02 | 8.774E-02 | 4.872E-02 | NOT IDENT. |
| ND-147  | 5.434E-01  | 7.884E-01 | 7.276E-01 | 4.023E-01 | NOT IDENT. |
| PM-149  | 4.440E-01  | 2.884E+01 | 2.539E+01 | 1.471E+01 | NOT IDENT. |
| EU-152  | -2.551E-02 | 1.820E-01 | 1.551E-01 | 9.284E-02 | FAIL ABUN  |
| GD-153  | -8.822E-02 | 7.963E-02 | 6.569E-02 | 4.063E-02 | NOT IDENT. |
| EU-154  | -1.366E-01 | 1.448E-01 | 8.790E-02 | 7.387E-02 | FAIL ABUN  |
| EU-155  | 4.733E-02  | 1.126E-01 | 1.016E-01 | 5.747E-02 | FAIL ABUN  |
| TB-160  | -3.682E-01 | 3.459E-01 | 2.728E-01 | 1.765E-01 | FAIL ABUN  |
| HO-166M | 6.122E-02  | 1.389E-01 | 1.223E-01 | 7.088E-02 | FAIL ABUN  |
| TA-182  | 3.633E-02  | 2.562E-01 | 2.198E-01 | 1.307E-01 | NOT IDENT. |
| IR-192  | 1.313E-02  | 6.096E-02 | 5.371E-02 | 3.110E-02 | FAIL ABUN  |
| HG-203  | -3.303E-02 | 5.605E-02 | 4.749E-02 | 2.860E-02 | NOT IDENT. |
| BI-207  | -9.188E-02 | 1.494E-01 | 1.203E-01 | 7.624E-02 | FAIL ABUN  |
| PB-210  | 7.211E-01  | 8.206E-01 | 7.486E-01 | 4.186E-01 | NOT IDENT. |
| PB-211  | 8.208E-02  | 1.516E+00 | 1.284E+00 | 7.736E-01 | NOT IDENT. |
| BI-212  | 1.949E+00  | 1.162E+00 | 1.031E+00 | 5.928E-01 | FAIL ABUN  |
| BI-214  | 9.401E-01  | 2.712E-01 | 2.041E-01 | 1.384E-01 | FAIL ABUN  |
| RN-219  | 8.226E-01  | 8.375E-01 | 7.507E-01 | 4.273E-01 | NOT IDENT. |
| RA-223  | -3.893E-02 | 1.117E+00 | 9.662E-01 | 5.699E-01 | FAIL ABUN  |
| RA-226  | 9.401E-01  | 2.712E-01 | 2.041E-01 | 1.384E-01 | FAIL ABUN  |
| AC-227  | 7.201E-02  | 4.092E-01 | 3.679E-01 | 2.088E-01 | NOT IDENT. |
| TH-227  | 7.201E-02  | 4.092E-01 | 3.679E-01 | 2.088E-01 | NOT IDENT. |
| AC-228  | 1.972E+00  | 8.781E-01 | 4.712E-01 | 4.480E-01 | FAIL ABUN  |
| RA-228  | 1.972E+00  | 8.781E-01 | 4.712E-01 | 4.480E-01 | FAIL ABUN  |
| TH-229  | -5.290E-01 | 7.086E-01 | 6.237E-01 | 3.615E-01 | FAIL ABUN  |
| PA-231  | 1.179E+00  | 2.356E+00 | 2.134E+00 | 1.202E+00 | NOT IDENT. |
| TH-231  | -3.893E-02 | 1.117E+00 | 9.662E-01 | 5.699E-01 | FAIL ABUN  |
| TH-232  | 1.972E+00  | 8.781E-01 | 4.712E-01 | 4.480E-01 | FAIL ABUN  |
| PA-233  | -7.594E-02 | 1.141E-01 | 9.475E-02 | 5.823E-02 | NOT IDENT. |
| PA-234  | -2.210E-01 | 9.594E-01 | 8.156E-01 | 4.895E-01 | NOT IDENT. |
| PA-234M | 1.068E+01  | 1.190E+01 | 1.096E+01 | 6.071E+00 | NOT IDENT. |
| TH-234  | 3.815E-01  | 6.598E-01 | 6.228E-01 | 3.366E-01 | FAIL ABUN  |
| U-238   | 3.815E-01  | 6.598E-01 | 6.228E-01 | 3.366E-01 | FAIL ABUN  |
| NP-239  | -2.122E-01 | 4.384E-01 | 3.699E-01 | 2.237E-01 | NOT IDENT. |
| CM-247  | 2.362E-02  | 7.858E-02 | 6.779E-02 | 4.009E-02 | NOT IDENT. |
| CF-249  | 1.868E-02  | 7.574E-02 | 6.547E-02 | 3.864E-02 | NOT IDENT. |
| CF-251  | 4.634E-02  | 1.628E-01 | 1.528E-01 | 8.308E-02 | NOT IDENT. |

|         |           |           |           |                      |
|---------|-----------|-----------|-----------|----------------------|
| ANH-511 | 5.354E-02 | 7.197E-02 | 7.086E-02 | 3.672E-02 NOT IDENT. |
|---------|-----------|-----------|-----------|----------------------|

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*****
*                               GEL Laboratories LLC                               *
*                               2040 SAVAGE ROAD                               *
*                               CHARLESTON ,SC 29417                           *
*                               GAMMA SPECTROSCOPY BACKGROUND REPORT           *
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| ENERGY | MDA COUNTS |
|--------|------------|
| 46.54  | 305.4245   |
| 49.72  | 546.9866   |
| 57.36  | 718.7045   |
| 59.54  | 478.9696   |
| 63.29  | 211.1297   |
| 63.29  | 211.1297   |
| 64.28  | 184.6222   |
| 67.75  | 238.6447   |
| 69.67  | 289.2765   |
| 70.83  | 281.8506   |
| 72.81  | 279.8756   |
| 72.87  | 279.9359   |
| 72.87  | 279.9359   |
| 74.82  | 278.5217   |
| 74.82  | 278.5217   |
| 74.82  | 278.5217   |
| 74.97  | 278.6722   |
| 77.11  | 280.7794   |
| 77.11  | 280.7794   |
| 77.11  | 280.7794   |
| 79.69  | 249.5102   |
| 79.80  | 239.9509   |
| 80.12  | 240.2111   |
| 80.19  | 240.2678   |
| 80.57  | 246.1080   |
| 81.00  | 271.3862   |
| 81.07  | 271.4500   |
| 81.07  | 271.4500   |
| 83.79  | 227.7894   |
| 83.79  | 227.7894   |
| 85.43  | 282.3925   |
| 86.48  | 281.9336   |
| 86.55  | 281.9966   |
| 86.79  | 282.2103   |
| 86.94  | 226.5848   |
| 87.57  | 227.0370   |
| 88.03  | 227.3668   |
| 88.47  | 227.6803   |
| 89.96  | 222.3267   |
| 91.11  | 216.6793   |
| 92.59  | 200.4163   |
| 92.59  | 200.4163   |
| 93.35  | 200.8761   |
| 94.67  | 156.1322   |
| 94.87  | 148.9929   |
| 94.87  | 148.9929   |
| 95.86  | 153.7811   |
| 97.43  | 185.8247   |
| 98.44  | 151.2876   |
| 99.53  | 138.5652   |
| 100.11 | 140.9980   |
| 103.18 | 159.9972   |
| 103.37 | 160.0818   |
| 105.31 | 167.6456   |
| 106.12 | 157.9355   |
| 109.28 | 151.3746   |
| 111.00 | 164.5466   |
| 111.76 | 163.7369   |
| 116.30 | 153.0030   |
| 117.23 | 156.8204   |
| 121.12 | 166.4904   |
| 121.78 | 166.7593   |
| 122.06 | 166.8733   |
| 123.07 | 170.0120   |
| 131.20 | 146.2712   |
| 133.52 | 183.8077   |
| 136.00 | 144.6533   |

|        |          |
|--------|----------|
| 136.47 | 161.6992 |
| 140.51 | 133.1115 |
| 140.51 | 0.0000   |
| 143.76 | 142.2193 |
| 144.24 | 142.3644 |
| 144.24 | 142.3644 |
| 145.44 | 152.5706 |
| 152.43 | 166.0349 |
| 153.25 | 146.7204 |
| 154.21 | 139.4877 |
| 154.21 | 139.4877 |
| 156.02 | 178.5574 |
| 158.56 | 162.6101 |
| 159.00 | 153.4736 |
| 162.66 | 182.5982 |
| 163.33 | 170.9289 |
| 165.86 | 171.7591 |
| 176.60 | 163.8766 |
| 177.52 | 145.8124 |
| 181.07 | 130.4828 |
| 184.41 | 147.1593 |
| 185.72 | 162.1113 |
| 193.51 | 172.3555 |
| 197.04 | 150.7950 |
| 205.31 | 166.0999 |
| 210.85 | 159.7114 |
| 215.65 | 175.7821 |
| 222.11 | 191.5945 |
| 227.38 | 151.4469 |
| 228.16 | 146.8814 |
| 228.18 | 146.8861 |
| 235.69 | 178.1800 |
| 235.96 | 172.4991 |
| 235.96 | 172.4991 |
| 238.63 | 155.8367 |
| 238.63 | 155.8367 |
| 240.99 | 156.3525 |
| 242.00 | 156.5733 |
| 244.70 | 139.6963 |
| 252.40 | 145.0883 |
| 252.80 | 145.1666 |
| 256.23 | 139.9199 |
| 256.23 | 139.9199 |
| 260.90 | 143.7580 |
| 264.66 | 126.5272 |
| 268.22 | 141.1176 |
| 269.46 | 133.3220 |
| 269.46 | 133.3220 |
| 271.23 | 116.5405 |
| 273.65 | 151.1597 |
| 276.40 | 132.4685 |
| 277.37 | 127.5637 |
| 277.60 | 140.7675 |
| 278.00 | 116.5184 |
| 279.20 | 131.9122 |
| 279.54 | 145.1646 |
| 280.46 | 125.0045 |
| 283.69 | 114.2741 |
| 284.31 | 130.6979 |
| 285.41 | 122.6929 |
| 285.90 | 125.8353 |
| 287.50 | 106.6025 |
| 293.27 | 91.3412  |
| 295.22 | 120.0003 |
| 295.96 | 120.1041 |
| 298.57 | 129.3000 |
| 299.98 | 118.5876 |
| 299.98 | 118.5876 |
| 300.09 | 118.6039 |
| 300.09 | 118.6039 |
| 300.13 | 118.6085 |
| 301.36 | 141.6999 |
| 302.85 | 148.2056 |
| 304.50 | 98.2953  |
| 304.50 | 98.2953  |
| 304.85 | 99.3797  |
| 308.46 | 111.3440 |
| 311.90 | 129.7040 |

|        |          |
|--------|----------|
| 316.51 | 124.0126 |
| 319.41 | 112.7134 |
| 320.08 | 102.1563 |
| 323.87 | 114.3341 |
| 323.87 | 114.3341 |
| 328.76 | 129.9780 |
| 333.37 | 136.0181 |
| 334.37 | 131.2987 |
| 334.37 | 131.2987 |
| 338.28 | 130.2124 |
| 338.28 | 130.2124 |
| 338.32 | 130.2173 |
| 338.32 | 130.2173 |
| 338.32 | 130.2173 |
| 340.48 | 104.4102 |
| 340.55 | 104.4180 |
| 344.28 | 119.0169 |
| 351.06 | 109.9487 |
| 351.93 | 110.0464 |
| 356.01 | 96.1351  |
| 364.49 | 110.3196 |
| 366.42 | 109.4126 |
| 383.85 | 102.1747 |
| 388.16 | 92.3280  |
| 388.63 | 103.7728 |
| 391.69 | 112.0723 |
| 400.66 | 114.1485 |
| 401.81 | 92.3372  |
| 402.40 | 108.5555 |
| 404.85 | 113.4242 |
| 410.95 | 94.2594  |
| 414.70 | 99.8265  |
| 423.72 | 101.4971 |
| 427.09 | 107.9879 |
| 427.87 | 105.4015 |
| 433.94 | 105.0577 |
| 453.88 | 111.3355 |
| 463.37 | 110.3652 |
| 468.07 | 105.2856 |
| 473.00 | 117.6445 |
| 476.78 | 101.3995 |
| 477.60 | 105.1529 |
| 487.02 | 78.9754  |
| 492.35 | 74.6326  |
| 497.08 | 77.7074  |
| 511.00 | 81.3533  |
| 514.00 | 135.5692 |
| 527.90 | 80.4368  |
| 529.87 | 0.0000   |
| 531.02 | 58.5427  |
| 537.26 | 74.2248  |
| 546.56 | 0.0000   |
| 563.25 | 66.7300  |
| 569.33 | 60.1064  |
| 569.50 | 70.9519  |
| 569.70 | 70.9607  |
| 583.19 | 55.6855  |
| 600.60 | 51.2864  |
| 602.73 | 56.3914  |
| 604.72 | 45.1691  |
| 609.32 | 55.6143  |
| 609.32 | 55.6143  |
| 610.33 | 53.4236  |
| 614.28 | 48.6870  |
| 618.01 | 56.9331  |
| 621.93 | 56.0524  |
| 621.93 | 56.0524  |
| 633.25 | 65.6797  |
| 635.95 | 66.8150  |
| 636.99 | 75.0852  |
| 645.85 | 64.1116  |
| 657.76 | 69.9788  |
| 661.66 | 67.8426  |
| 661.66 | 67.8426  |
| 664.57 | 75.2761  |
| 666.33 | 63.6314  |
| 666.50 | 53.5906  |
| 677.62 | 60.0441  |



|         |          |
|---------|----------|
| 685.70  | 50.7964  |
| 695.00  | 60.6373  |
| 696.49  | 77.7229  |
| 696.51  | 77.7251  |
| 697.00  | 73.4852  |
| 702.65  | 55.5547  |
| 706.68  | 62.1029  |
| 711.68  | 59.0518  |
| 720.70  | 49.6331  |
| 721.93  | 57.0072  |
| 722.78  | 55.3047  |
| 722.91  | 55.3094  |
| 723.31  | 60.5083  |
| 724.19  | 60.5356  |
| 727.33  | 38.9817  |
| 733.00  | 64.5466  |
| 735.93  | 52.2158  |
| 739.50  | 78.4709  |
| 747.24  | 55.8108  |
| 752.31  | 53.7642  |
| 753.82  | 51.6099  |
| 756.73  | 58.2874  |
| 763.94  | 56.2964  |
| 765.81  | 60.7706  |
| 766.42  | 64.1048  |
| 777.92  | 51.1407  |
| 778.90  | 50.0537  |
| 783.70  | 62.4395  |
| 785.37  | 61.3765  |
| 795.86  | 67.3077  |
| 801.95  | 60.3082  |
| 810.29  | 66.8818  |
| 810.76  | 66.8981  |
| 815.77  | 63.4358  |
| 818.51  | 68.0566  |
| 832.01  | 56.6265  |
| 834.85  | 65.8477  |
| 836.80  | 0.0000   |
| 846.77  | 69.8992  |
| 856.80  | 61.6016  |
| 860.56  | 62.9432  |
| 871.09  | 66.9691  |
| 873.19  | 58.6549  |
| 875.33  | 0.0000   |
| 879.36  | 75.6251  |
| 880.51  | 65.3892  |
| 883.24  | 67.3400  |
| 884.68  | 52.4098  |
| 889.28  | 72.2119  |
| 898.04  | 65.9053  |
| 911.20  | 64.3958  |
| 911.20  | 64.3958  |
| 911.20  | 64.3958  |
| 926.50  | 83.8922  |
| 937.49  | 89.0788  |
| 944.13  | 90.2914  |
| 946.00  | 93.2465  |
| 949.00  | 86.6294  |
| 962.29  | 103.5700 |
| 964.08  | 129.7994 |
| 966.15  | 95.0093  |
| 968.97  | 104.8280 |
| 968.97  | 104.8280 |
| 968.97  | 104.8280 |
| 983.53  | 71.2819  |
| 996.26  | 57.9110  |
| 1001.03 | 50.1558  |
| 1004.73 | 69.9288  |
| 1037.84 | 71.8488  |
| 1038.76 | 0.0000   |
| 1048.07 | 64.1219  |
| 1050.41 | 60.1670  |
| 1050.41 | 60.1670  |
| 1063.66 | 72.5695  |
| 1085.87 | 55.9023  |
| 1099.45 | 56.1843  |
| 1112.07 | 59.5265  |
| 1115.54 | 75.0175  |

|         |         |
|---------|---------|
| 1120.29 | 54.5579 |
| 1120.29 | 54.5579 |
| 1120.55 | 51.4746 |
| 1121.30 | 58.6978 |
| 1131.51 | 0.0000  |
| 1173.23 | 30.4217 |
| 1177.93 | 24.5171 |
| 1189.05 | 27.4244 |
| 1204.77 | 18.0285 |
| 1221.41 | 15.9976 |
| 1231.02 | 18.1887 |
| 1235.36 | 12.8578 |
| 1238.28 | 16.0876 |
| 1260.41 | 0.0000  |
| 1271.85 | 8.6754  |
| 1274.44 | 13.0236 |
| 1274.54 | 14.1096 |
| 1291.59 | 3.2739  |
| 1298.22 | 0.0000  |
| 1312.11 | 9.8864  |
| 1332.49 | 11.9764 |
| 1365.19 | 5.5833  |
| 1368.63 | 0.0000  |
| 1384.29 | 10.2955 |
| 1408.01 | 13.1962 |
| 1457.56 | 0.0000  |
| 1460.82 | 3.8286  |
| 1489.16 | 10.6137 |
| 1505.03 | 12.5990 |
| 1596.21 | 10.9270 |
| 1620.50 | 3.9989  |
| 1678.03 | 0.0000  |
| 1690.97 | 8.1426  |
| 1764.49 | 1.0363  |
| 1764.49 | 1.0363  |
| 1770.23 | 10.3772 |
| 1771.35 | 7.2660  |
| 1791.20 | 0.0000  |
| 1836.06 | 4.2158  |

TOTAL URANIUM BY GAMMA SPEC REPORT  
Sample:G1202054950

|                             |            |      |
|-----------------------------|------------|------|
| Total Uranium Activity      | 1.3408E+00 | ug/g |
| Total Uranium Counting Unc. | 1.9681E+00 | ug/g |
| Total Uranium Tpu           | 1.0041E-06 | ug/g |
| Total Uranium Mda           | 1.8551E+00 | ug/g |

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*****
*
*               GEL Laboratories LLC               *
*               2040 SAVAGE ROAD                   *
*               CHARLESTON , SC 29417               *
*               GROSS GAMMA REPORT                 *
*
*****
*
*  BATCH ID      : 958216                          SAMPLE ID   : G1202054950
*  ANALYST       : MXR1                             DETECTOR    : GAM21
*  SAMPLE DATE   : 2-MAR-2010 00:00:00.00          COUNT TIME   : 0 01:00:00.00
*  ANALYSIS DATE : 11-MAR-2010 19:35:21.56         SAMPLE ALQT  : 155.440 GRAM
*
*****

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GROSS GAMMA ACTIVITY (pCi/GRAM ) : 2.776E+01
GROSS GAMMA ERROR   (pCi/GRAM ) : 2.589E+00
GROSS GAMMA MDA     (pCi/GRAM ) : 3.647E+00
GROSS GAMMA DLC     (pCi/GRAM ) : 1.762E+00

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# Radiochemistry Batch Checklist, Rev10

Batch# 964049 Product: H3 Date: 3/23/10

| Criteria:   | Yes | No | Comments |
|---|-----|----|----------|
| Sample Solids are less than or equal to 100 mg for GAB.   |     |    | N/A      |
| Samples have been blank corrected (if required)   |     |    | N/A      |
| If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay. | ✓   |    |          |
| Instrument source check is within limits.   | ✓   |    |          |
| Instrument bkg check is within limits.  | ✓   |    |          |
| Method RDL/ LLD has been met.   | ✓   |    |          |
| If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.   | ✓   |    |          |
| Or meets the client's required RER acceptance criteria.   |     |    |          |
| Tracer yield is 15-125% . Carrier yield 25-125%.  |     |    | N/A      |
| Or meets the client's contract acceptance criteria.   |     |    |          |
| Method blank is less than the RDL/ LLD.   | ✓   |    |          |
| (If rad samples, < 5% of lowest activity)   | ✓   |    |          |
| Sample was run within hold time.  | ✓   |    |          |
| Sample was correctly preserved if required.   | ✓   |    |          |
| Smears Taken for Radioactive batches.   | ✓   |    |          |
| Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.   | ✓   |    |          |
| No blank spaces on data forms.  | ✓   |    |          |
| All line outs initialed and dated.  | ✓   |    |          |
| No transcription errors are apparent.   |     |    |          |
| Aux data is correct.  |     |    | N/A      |
| Client Special requirements page has been checked.  | ✓   |    |          |
| Raw Data and/ or spectrum are included and properly stasured.   | ✓   |    |          |
| QC data entered into QC database and batch is in REVW   | ✓   |    |          |
| Hit notification complete (if necessary)  |     |    | N/A      |
| Batch entered into Case Narrative.  | ✓   |    |          |
| Batch Data Exception Reports (DER) completed, if applicable.  |     |    | N/A      |
| Batch Data Exception Reports (DER) second reviewed and disposition verified to be completed.  |     |    | N/A      |
| Aliquot Correction completed if required.   |     |    | N/A      |
| Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)                  | ✓   |    |          |

GEL Laboratories, LLC

RADchecklistrev10, revised 1/13/2010

Primary Review Performed By

Secondary Review Performed By

LANL

3/12 - 3/23/10 5 of 562

# Tritium Que Sheet

17-MAR-10

Batch #: 964049

Analyst: KXK First Client Due Date: 23-MAR-10

Internal Due Date: 12-MAR-10

Spike Isotope: Hydrogen-3

Spike Code: 0134-K

Expiration Date: 3/27/10

Vol: 0.1

LCS Isotope: Hydrogen-3

LCS Code: 0134-K

Expiration Date: 3/27/10

Vol: 0.1

Prep Date: 3/12/10

Initials: JK

Pipet ID: 29709108

Witness: EK

\* recopied: 28 3/17/10

| Sample ID    | Client Samp ID             | Type   | Hazard Code | Min CRDL    | Matrix     | Client     | Sample Date | Aliquot in vial (g/mL) | LSC Rack # | Dist Rig # | Vol added for Dist (mL) | Initial Sample Aliquot (g/mL) | Final Wt (g) | Total Moisture Dist (mL) |
|--------------|----------------------------|--------|-------------|-------------|------------|------------|-------------|------------------------|------------|------------|-------------------------|-------------------------------|--------------|--------------------------|
| 247524003-1  | RE35-10-8489               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 16-FEB-10   | 10                     | 1          | 1          |                         | 551.32                        | 544.70       | 10.62                    |
| 247564001-1  | RE36-10-8489               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 2          | 2          |                         | 453.93                        | 432.14       | 21.79                    |
| 247564002-1  | RE36-10-8486               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 3          | 3          |                         | 414.45                        | 448.60       | 15.19                    |
| 247564003-1  | RE36-10-8487               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 4          | 4          |                         | 471.93                        | 446.45       | 25.48                    |
| 247564004-1  | RE36-10-8462               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 5          | 5          |                         | 473.97                        | 416.86       | 7.11                     |
| 247564005-1  | RE36-10-8463               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 6          | 6          |                         | 421.30                        | 409.92       | 11.38                    |
| 247569001-1  | RE36-10-8490               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 20-FEB-10   | 10                     | 7          | 7          |                         | 537.59                        | 510.17       | 27.42                    |
| 247569002-1  | RE36-10-8470               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 20-FEB-10   | 10                     | 8          | 8          |                         | 498.47                        | 417.56       | 30.91                    |
| 247569003-1  | RE36-10-8476               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 20-FEB-10   | 10                     | 9          | 9          |                         | 485.30                        | 414.92       | 20.38                    |
| 247569004-1  | RE36-10-8480               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 20-FEB-10   | 10                     | 10         | 10         |                         | 441.61                        | 393.92       | 47.69                    |
| 247569005-1  | RE36-10-8474               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 20-FEB-10   | 10                     | 11         | 11         |                         | 402.71                        | 351.16       | 51.55                    |
| 247569006-1  | RE36-10-8478               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 20-FEB-10   | 10                     | 12         | 12         |                         | 545.30                        | 519.67       | 25.63                    |
| 247569007-1  | RE36-10-8483               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 20-FEB-10   | 10                     | 13         | 13         |                         | 423.95                        | 414.20       | 9.75                     |
| 247569008-1  | RE36-10-8482               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 20-FEB-10   | 10                     | 14         | 14         |                         | 497.38                        | 472.51       | 24.87                    |
| 248028001-1  | RE15-10-8389               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 15         | 15         |                         | 421.49                        | 382.71       | 38.78                    |
| 248028002-1  | RE15-10-8388               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 16         | 16         |                         | 446.11                        | 412.21       | 33.90                    |
| 248028003-1  | RE15-10-8390               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 17         | 17         |                         | 478.79                        | 406.01       | 72.78                    |
| 248028004-1  | RE15-10-8392               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 18         | 18         |                         | 440.35                        | 394.48       | 45.87                    |
| 248028005-1  | RE15-10-8391               | SAMPLE | 25          | pCi/mL SOIL | LANL010    | LANL010    | 19-FEB-10   | 10                     | 19         | 19         |                         | 445.60                        | 397.03       | 48.57                    |
| 1202068192-1 | MB for batch 964049        | MB     |             |             | QC ACCOUNT | QC ACCOUNT |             | 10                     | 20         | 20         |                         | 20.00                         | 0            | 20.00                    |
| 1202068193-1 | RE15-10-8391(248028005DUP) | DUP    |             |             | QC ACCOUNT | QC ACCOUNT | 19-FEB-10   | 10                     | 19         | 19         |                         | 445.60                        | 397.03       | 48.57                    |
| 1202068194-1 | LCS for batch 964049       | LCS    |             |             | QC ACCOUNT | QC ACCOUNT |             | 10                     | 21         | 21         |                         | 20.00                         | 0            | 20.00                    |

Bkg Rack #: 37, 37, 47, 58-1  
dailies

Bkg prepared with dead water? (Yes/No)

Comments:

Instrument Used (circle as appropriate): LS6000 (Red) 7065155, LS6500 (Blue) 7067083, LS6500 (Gold) 7070506, LS6500 (Green) 7067404, Wallac (Yellow) 4140123, LS6000 (Brown) 7060655, Wallac (Pink) 2200082, Wallac (White) 4140299, Purple 7069123, Silver 7060656, Orange DG06095768

Calibration Used: Ecosint Ultra 10 mL sample/13 mL Ecosint Ultra  
Data Reviewed By: JK 3/23/10

GEL Laboratories LLC, Radiochemistry Division

Page 1 of 1

| DATE      | 3/12/2010 | INITIALS       | KXK2                   | BATCH NUMBER  | 964049                        |                |                        |                             |                        |
|-----------|-----------|----------------|------------------------|---|-------------------------------|----------------|------------------------|-----------------------------|------------------------|
| Sample #  | Flask (g) | Sample Wet (g) | Sample Wet & Flask (g) | % Moisture of Sample (Balance Interface using % Moisture Batch) | Total Moisture in Sample (mL) | Sample Dry (g) | Sample Dry & Flask (g) | mLs aliquoted into LSC vial | Collection Tube Number |
| 247774003 | 200       | 551.32         | 751.32                 | 0.012   | 6.62                          | 544.70         | 744.70                 | 10                          |                        |
| 247964001 | 200       | 453.93         | 653.93                 | 0.048   | 21.79                         | 432.14         | 632.14                 | 10                          |                        |
| 247964002 | 200       | 464.45         | 664.45                 | 0.034   | 15.79                         | 448.66         | 648.66                 | 10                          |                        |
| 247964003 | 200       | 471.93         | 671.93                 | 0.054   | 25.48                         | 446.45         | 646.45                 | 10                          |                        |
| 247964004 | 200       | 473.97         | 673.97                 | 0.015   | 7.11                          | 466.86         | 666.86                 | 7                           |                        |
| 247964005 | 200       | 421.30         | 621.30                 | 0.027   | 11.38                         | 408.92         | 608.92                 | 8                           |                        |
| 247969001 | 200       | 537.59         | 737.59                 | 0.051   | 27.42                         | 510.17         | 710.17                 | 10                          |                        |
| 247969002 | 200       | 498.47         | 698.47                 | 0.062   | 30.91                         | 487.56         | 687.56                 | 10                          |                        |
| 247969003 | 200       | 485.30         | 685.30                 | 0.042   | 20.38                         | 464.92         | 664.92                 | 10                          |                        |
| 247969004 | 200       | 441.61         | 641.61                 | 0.108   | 47.69                         | 393.92         | 593.92                 | 10                          |                        |
| 247969005 | 200       | 402.71         | 602.71                 | 0.128   | 51.55                         | 351.16         | 551.16                 | 10                          |                        |
| 247969006 | 200       | 545.30         | 745.30                 | 0.047   | 25.63                         | 519.67         | 719.67                 | 10                          |                        |
| 247969007 | 200       | 423.95         | 623.95                 | 0.023   | 9.75                          | 414.20         | 614.20                 | 8                           |                        |
| 247969008 | 200       | 497.38         | 697.38                 | 0.050   | 24.87                         | 472.51         | 672.51                 | 10                          |                        |
| 248028001 | 200       | 421.49         | 621.49                 | 0.092   | 38.78                         | 382.71         | 582.71                 | 10                          |                        |
| 248028002 | 200       | 446.11         | 646.11                 | 0.076   | 33.90                         | 412.21         | 612.21                 | 10                          |                        |
| 248028003 | 200       | 478.79         | 678.79                 | 0.152   | 72.78                         | 406.01         | 606.01                 | 10                          |                        |
| 248028004 | 200       | 440.35         | 640.35                 | 0.195   | 85.87                         | 354.48         | 554.48                 | 10                          |                        |
| 248028005 | 200       | 445.60         | 645.60                 | 0.109   | 48.57                         | 397.03         | 597.03                 | 10                          |                        |
| MB        | 200       | 20.00          | 220.00                 | 1.000   | 20.00                         | 0.00           | 200.00                 | 10                          |                        |
| DUP       | 200       | 445.60         | 645.60                 | 0.109   | 48.57                         | 397.03         | 597.03                 | 10                          |                        |
| LCS       | 200       | 20.00          | 220.00                 | 1.000   | 20.00                         | 0.00           | 200.00                 | 10                          |                        |

## Tritium Solid

Filename : H3VAC.XLS  
File type : Excel  
Version # : 1.2.6

Batch : 964049  
Analyst : KXK2  
Prep Date : 3/12/2010

Spike S/N :  
Spike Exp Date :  
Spike Activity (dpm/ml):  
Spike Volume Added:

LCS S/N : 0134-K  
LCS Exp Date : 3/27/2010  
LCS Activity (dpm/ml): 2457.20  
LCS Volume Added: 0.10

Procedure Code : LSC\_VH3S  
Paramname : Tritium  
Required MDC : 250 pCi/L  
Half-life of Tritium : 12.32 years

H-3 Abundance : 1  
Method Uncertainty : 0.0691  
Geometry: 10mL DW/13mL  
Eosclint Ultra

Pipet, 0.1 ml Stdev : +/-  
Pipet, 0.5 ml Stdev : +/-  
Pipet, 1.0 ml Stdev : +/-  
Pipet, 5.0 ml Stdev : +/-

0.000701 ml  
0.002564 ml  
0.005480 ml  
0.025729 ml

| Sample Characteristics |              | Wet Sample Weight (g) | Total Moisture L | Sample Aliquot In Vial L | Sample Aliquot Stdev. L | Dry Sample Weight (g) | % Moisture of Sample | Rig number | Sample Date/Time |
|------------------------|--------------|-----------------------|------------------|--------------------------|-------------------------|-----------------------|----------------------|------------|------------------|
| Pos.                   | Sample ID    |                       |                  |                          |                         |                       |                      |            |                  |
| 1                      | 247964001.1  | 453.93                | 0.0218           | 0.0100                   | 2.5729E-05              | 432.14                | 4.80%                | 2          | 2/19/2010 12:00  |
| 2                      | 247964002.1  | 464.45                | 0.0158           | 0.0100                   | 2.5729E-05              | 448.66                | 3.40%                | 3          | 2/19/2010 12:00  |
| 3                      | 247964003.1  | 471.93                | 0.0255           | 0.0100                   | 2.5729E-05              | 446.45                | 5.40%                | 4          | 2/19/2010 12:00  |
| 4                      | 247964004.1  | 473.97                | 0.0071           | 0.0070                   | 2.5729E-05              | 466.86                | 1.50%                | 5          | 2/19/2010 12:00  |
| 5                      | 247964005.1  | 421.30                | 0.0114           | 0.0080                   | 2.5729E-05              | 409.92                | 2.70%                | 6          | 2/19/2010 12:00  |
| 6                      | 247969001.1  | 537.59                | 0.0274           | 0.0100                   | 2.5729E-05              | 510.17                | 5.10%                | 7          | 2/20/2010 12:00  |
| 7                      | 247969002.1  | 498.47                | 0.0309           | 0.0100                   | 2.5729E-05              | 467.56                | 6.20%                | 8          | 2/20/2010 12:00  |
| 8                      | 247969003.1  | 485.30                | 0.0204           | 0.0100                   | 2.5729E-05              | 464.92                | 4.20%                | 9          | 2/20/2010 12:00  |
| 9                      | 247969004.1  | 441.61                | 0.0477           | 0.0100                   | 2.5729E-05              | 393.82                | 10.80%               | 10         | 2/20/2010 12:00  |
| 10                     | 247969005.1  | 402.71                | 0.0516           | 0.0100                   | 2.5729E-05              | 351.16                | 12.80%               | 11         | 2/20/2010 12:00  |
| 11                     | 247969006.1  | 545.30                | 0.0256           | 0.0100                   | 2.5729E-05              | 519.67                | 4.70%                | 12         | 2/20/2010 12:00  |
| 12                     | 247969007.1  | 423.95                | 0.0098           | 0.0080                   | 2.5729E-05              | 414.20                | 2.30%                | 13         | 2/20/2010 12:00  |
| 13                     | 247969008.1  | 497.38                | 0.0249           | 0.0100                   | 2.5729E-05              | 472.51                | 5.00%                | 14         | 2/20/2010 12:00  |
| 14                     | 248028001.1  | 421.49                | 0.0388           | 0.0100                   | 2.5729E-05              | 382.71                | 9.20%                | 15         | 2/19/2010 12:00  |
| 15                     | 248028002.1  | 446.11                | 0.0339           | 0.0100                   | 2.5729E-05              | 412.21                | 7.60%                | 16         | 2/19/2010 12:00  |
| 16                     | 248028003.1  | 478.79                | 0.0728           | 0.0100                   | 2.5729E-05              | 406.01                | 15.20%               | 17         | 2/19/2010 12:00  |
| 17                     | 248028004.1  | 440.35                | 0.0659           | 0.0100                   | 2.5729E-05              | 354.48                | 19.50%               | 18         | 2/19/2010 12:00  |
| 18                     | 248028005.1  | 445.60                | 0.0486           | 0.0100                   | 2.5729E-05              | 397.03                | 10.90%               | 19         | 2/19/2010 12:00  |
| 19                     | 1202068192.1 | 20.00                 | 0.0200           | 0.0100                   | 2.5729E-05              | 0.00                  | 100.00%              | 20         | 3/12/2010 0:00   |
| 20                     | 1202068193.1 | 445.60                | 0.0486           | 0.0100                   | 2.5729E-05              | 397.03                | 10.90%               | 19         | 2/19/2010 12:00  |
| 21                     | 1202068194.1 | 20.00                 | 0.0200           | 0.0100                   | 2.5729E-05              | 0.00                  | 100.00%              | 21         | 3/12/2010 0:00   |



| Count raw Data |                 |                      |         | Background |      |                   | Calibration Data      |              |            |                  | Detector Efficiency Error |                               | Backgrounds     |                 |                       |
|----------------|-----------------|----------------------|---------|------------|------|-------------------|-----------------------|--------------|------------|------------------|---------------------------|-------------------------------|-----------------|-----------------|-----------------------|
| Pos.           | Rack Position # | Counting Time (min.) | Quench# | Gross cpm  | cpm  | Count Time (min.) | Count Start Date/Time | Sample Decay | Counted on | Calibration Date | Calibration Due Date      | Detector Efficiency (cpm/dpm) | Error (cpm/dpm) | Rack Position # | Count Start Date/Time |
| 1              | 47-2            | 120                  | 117.3   | 3.27       | 2.72 | 120               | 3/19/2010 14:45       | 0.996        | LSCGOLD    | 8/20/2009        | 8/31/2010                 | 0.1811                        | 0.00792         | 47-1            | 3/19/2010 12:41       |
| 2              | 41              | 35.0297              | 762.66  | 1.75       | 1.86 | 50                | 3/15/2010 10:24       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2754                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 3              | 42              | 35.0297              | 761.36  | 1.81       | 1.86 | 50                | 3/15/2010 11:02       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2733                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 4              | 40              | 60.0297              | 759.63  | 1.43       | 1.04 | 60                | 3/22/2010 17:53       | 0.995        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2705                        | 0.00792         | 39              | 3/22/2010 16:51       |
| 5              | 44              | 50.0297              | 763.97  | 1.82       | 1.86 | 50                | 3/15/2010 12:17       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2775                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 6              | 45              | 35.0297              | 764.73  | 1.87       | 1.86 | 50                | 3/15/2010 13:09       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2787                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 7              | 48              | 35.0297              | 759.12  | 2.68       | 1.86 | 50                | 3/15/2010 13:47       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2697                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 8              | 47              | 35.0297              | 756.76  | 1.43       | 1.86 | 50                | 3/15/2010 14:25       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2658                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 9              | 48              | 35.0297              | 756.01  | 2.16       | 1.86 | 50                | 3/15/2010 15:02       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2645                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 10             | 49              | 35.0297              | 758.97  | 1.43       | 1.86 | 50                | 3/15/2010 15:40       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2694                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 11             | 50              | 35.0297              | 760.61  | 2.24       | 1.86 | 50                | 3/15/2010 16:17       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2721                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 12             | 51              | 35.0296              | 761.87  | 1.81       | 1.86 | 50                | 3/15/2010 16:55       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2741                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 13             | 52              | 50.0296              | 756.87  | 1.69       | 1.86 | 50                | 3/15/2010 17:32       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2660                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 14             | 53              | 35.0296              | 761.41  | 2.57       | 1.86 | 50                | 3/15/2010 18:25       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2734                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 15             | 54              | 35.013               | 759.42  | 2.39       | 1.86 | 50                | 3/15/2010 19:02       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2685                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 16             | 55              | 35.0296              | 760.82  | 2.62       | 1.86 | 50                | 3/15/2010 19:40       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2724                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 17             | 56              | 35.0296              | 760.37  | 1.19       | 1.86 | 50                | 3/15/2010 20:17       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2717                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 18             | 57              | 35.0296              | 760.94  | 2.39       | 1.86 | 50                | 3/15/2010 20:55       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2726                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 19             | 58-2            | 120                  | 729.69  | 2.53       | 2.69 | 120               | 3/17/2010 15:23       | 0.999        | LSCYELLOW  | 8/21/2009        | 8/31/2010                 | 0.2000                        | 0.00792         | 58-1            | 3/17/2010 13:21       |
| 20             | 59              | 35.0296              | 762.33  | 2.42       | 1.86 | 50                | 3/15/2010 22:10       | 0.996        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2749                        | 0.00792         | 38              | 3/15/2010 8:47        |
| 21             | 60              | 15.0296              | 770.89  | 37.04      | 1.86 | 50                | 3/15/2010 22:48       | 0.998        | LSCORANGE  | 7/23/2009        | 7/31/2010                 | 0.2884                        | 0.00792         | 38              | 3/15/2010 8:47        |

## Notes:

- 1 - Results are decay corrected to Sample Date/Time  
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date  
 3 - Spike Nominals are decay corrected to Sample Date/Time

\* - RPD changed to 0% due to activity below MDC for 1202068193.1

| Results |          | Decision Level |       | Critical Level | Required MDC | MDC    | Sample Act. Conc. | Sample Act. Error | Net Count Rate | Net Count Rate Error | Counting Uncertainty | 1 SIGMA Total Prop. Uncertainty | Sample QC | Sample Type | RPD  | RER    | Nominal pCvL | Recovery |
|---------|----------|----------------|-------|----------------|--------------|--------|-------------------|-------------------|----------------|----------------------|----------------------|---------------------------------|-----------|-------------|------|--------|--------------|----------|
| Pos.    | pCv/L    | pCv/L          | pCv/L | pCv/L          | pCv/L        | pCv/L  | pCv/L             | pCv/L             | CPM            | CPM                  | pCv/L                | pCv/L                           |           |             |      |        |              |          |
| 1       | 123.9121 | 87.4830        | 250   | 181.2104       | 137.3782     | 0.406  | 0.550             | 0.223             | 55.8048        | 0.223                | 55.8048              | 56.6191                         | SAMPLE    |             |      |        |              |          |
| 2       | 114.9300 | 81.1416        | 250   | 176.3429       | -18.0586     | 2.684  | -0.110            | 0.295             | 48.4607        | 0.295                | 48.4607              | 48.4618                         | SAMPLE    |             |      |        |              |          |
| 3       | 115.8139 | 81.7856        | 250   | 177.6980       | -8.2718      | 5.961  | -0.050            | 0.298             | 49.3110        | 0.298                | 49.3110              | 49.3121                         | SAMPLE    |             |      |        |              |          |
| 4       | 103.6821 | 73.2004        | 250   | 158.3477       | 93.2317      | 0.520  | 0.390             | 0.203             | 48.4914        | 0.203                | 48.4914              | 48.9254                         | SAMPLE    |             |      |        |              |          |
| 5       | 129.3834 | 91.3529        | 250   | 184.9177       | -8.1463      | 6.780  | -0.040            | 0.271             | 55.2343        | 0.271                | 55.2343              | 55.2350                         | SAMPLE    |             |      |        |              |          |
| 6       | 113.5442 | 80.1832        | 250   | 174.2165       | 1.6218       | 30.063 | 0.010             | 0.301             | 48.8064        | 0.301                | 48.8064              | 48.8095                         | SAMPLE    |             |      |        |              |          |
| 7       | 117.3825 | 82.8589        | 250   | 180.0752       | 137.4680     | 0.411  | 0.820             | 0.337             | 56.5247        | 0.337                | 56.5247              | 57.3298                         | SAMPLE    |             |      |        |              |          |
| 8       | 119.0712 | 84.0853        | 250   | 182.6989       | -73.1364     | 0.650  | -0.430            | 0.278             | 47.5022        | 0.278                | 47.5022              | 47.5034                         | SAMPLE    |             |      |        |              |          |
| 9       | 119.6278 | 84.4583        | 250   | 183.5510       | 51.2639      | 1.048  | 0.300             | 0.314             | 53.7226        | 0.314                | 53.7226              | 53.8411                         | SAMPLE    |             |      |        |              |          |
| 10      | 117.4706 | 82.9353        | 250   | 180.2411       | -72.1533     | 0.650  | -0.430            | 0.278             | 46.8637        | 0.278                | 46.8637              | 46.8649                         | SAMPLE    |             |      |        |              |          |
| 11      | 116.3177 | 82.1213        | 250   | 178.4721       | 63.1376      | 0.837  | 0.380             | 0.318             | 52.8361        | 0.318                | 52.8361              | 53.0188                         | SAMPLE    |             |      |        |              |          |
| 12      | 144.3148 | 101.8875       | 250   | 221.4294       | -10.3072     | 5.961  | -0.050            | 0.298             | 61.4461        | 0.298                | 61.4461              | 61.4474                         | SAMPLE    |             |      |        |              |          |
| 13      | 107.9921 | 76.2434        | 250   | 162.6791       | -28.8853     | 1.567  | -0.170            | 0.266             | 45.2771        | 0.266                | 45.2771              | 45.2778                         | SAMPLE    |             |      |        |              |          |
| 14      | 115.7851 | 81.7453        | 250   | 177.6549       | 117.4274     | 0.468  | 0.710             | 0.332             | 54.9894        | 0.332                | 54.9894              | 55.5943                         | SAMPLE    |             |      |        |              |          |
| 15      | 117.9013 | 83.2393        | 250   | 180.9067       | 86.2487      | 0.613  | 0.530             | 0.325             | 54.6783        | 0.325                | 54.6783              | 55.0305                         | SAMPLE    |             |      |        |              |          |
| 16      | 116.1926 | 82.0330        | 250   | 178.2801       | 126.1392     | 0.440  | 0.760             | 0.335             | 56.5381        | 0.335                | 56.5381              | 56.2286                         | SAMPLE    |             |      |        |              |          |
| 17      | 116.5056 | 82.2540        | 250   | 178.7604       | -111.5013    | 0.398  | -0.670            | 0.267             | 44.3906        | 0.267                | 44.3906              | 44.3917                         | SAMPLE    |             |      |        |              |          |
| 18      | 116.1105 | 81.9750        | 250   | 178.1542       | 87.9034      | 0.613  | 0.530             | 0.325             | 53.8471        | 0.325                | 53.8471              | 54.1940                         | SAMPLE    |             |      |        |              |          |
| 19      | 111.2132 | 78.5174        | 250   | 162.6705       | -36.0678     | 1.304  | -0.160            | 0.208             | 47.0159        | 0.208                | 47.0159              | 47.0160                         | MB        |             |      |        |              |          |
| 20      | 115.1813 | 81.3049        | 250   | 176.6979       | 92.1198      | 0.582  | 0.560             | 0.326             | 53.6234        | 0.326                | 53.6234              | 54.0059                         | DUP       | 248028005.1 | 0.0% | 0.0185 | 5534.2351    | 99.3%    |
| 21      | 146.0612 | 103.1205       | 250   | 237.4319       | 5487.3234    | 0.046  | 35.180            | 1.582             | 247.1545       | 1.582                | 247.1545             | 455.7176                        | LCS       |             |      |        |              |          |

# REGISTRY

MON 15 MAR 2010 8:45

\*\*\* DIRECTORY PATH :S:\LSC\O\DA\964049A0 \*\*\*

PARAMETER GROUP: 8  
ID: H-3 (1)

00A PROGRAM MODE 6 ->

| ORDER         | POS           | ID                    | CTIME            | COUNTS            | CUCNTS            | MCW          | REP          | STD          | STMS            | STIME           |
|---------------|---------------|-----------------------|------------------|-------------------|-------------------|--------------|--------------|--------------|-----------------|-----------------|
| 1             | 38            | BKG                   | 50:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| <del>2</del>  | <del>39</del> | <del>247774003</del>  | <del>35:00</del> | <del>1.0E04</del> | <del>NO LIM</del> | <del>1</del> | <del>1</del> | <del>Y</del> | <del>1/10</del> | <del>1:00</del> |
| <del>3</del>  | <del>40</del> | <del>247964001</del>  | <del>35:00</del> | <del>1.0E04</del> | <del>NO LIM</del> | <del>1</del> | <del>1</del> | <del>Y</del> | <del>1/10</del> | <del>1:00</del> |
| 4             | 41            | 247964002             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 5             | 42            | 247964003             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| <del>6</del>  | <del>43</del> | <del>247964004</del>  | <del>35:00</del> | <del>1.0E04</del> | <del>NO LIM</del> | <del>1</del> | <del>1</del> | <del>Y</del> | <del>1/10</del> | <del>1:00</del> |
| 7             | 44            | 247964005             | 50:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 8             | 45            | 247969001             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 9             | 46            | 247969002             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 10            | 47            | 247969003             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 11            | 48            | 247969004             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 12            | 49            | 247969005             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 13            | 50            | 247969006             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 14            | 51            | 247969007             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 15            | 52            | 247969008             | 50:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 16            | 53            | 248028001             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 17            | 54            | 248028002             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 18            | 55            | 248028003             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 19            | 56            | 248028004             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 20            | 57            | 248028005             | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| <del>21</del> | <del>58</del> | <del>1202068192</del> | <del>35:00</del> | <del>1.0E04</del> | <del>NO LIM</del> | <del>1</del> | <del>1</del> | <del>Y</del> | <del>1/10</del> | <del>1:00</del> |
| 22            | 59            | 1202068193            | 35:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |
| 23            | 60            | 1202068194            | 15:00            | 1.0E04            | NO LIM            | 1            | 1            | Y            | 1/10            | 1:00            |

NUMBER OF CYCLES 1  
COINCIDENCE BIAS (L/H) L

MCA INPUT TRIGG. INHIBIT  
1 LRSUM DCOS G  
2 GSUM G

MEMORY SPLIT  
L\*R  
L\*R

| WINDOW | CHANNELS | MCA | HALF |
|--------|----------|-----|------|
| 1      | 50- 175  | 1   | 2    |
| 2      | 5- 320   | 1   | 2    |
| 3      | 1- 1024  | 1   | 2    |
| 4      | 50- 320  | 1   | 1    |
| 5      | 50- 270  | 1   | 1    |
| 6      | 60- 220  | 1   | 1    |
| 7      | 1- 1024  | 2   | 1    |
| 8      | 1- 1024  | 2   | 2    |

SELECTED PRINTOUT FOR TERMINAL 1 (A)

SELECTED PRINTOUT FOR TERMINAL 2 (B)

| 1.                         | 2. | 3.    | 4.  | 5.   | 6.   | 7.   |
|----------------------------|----|-------|-----|------|------|------|
| POS                        | ID | CTIME | SQP | CPM1 | CPM2 | CPM3 |
| SEND SPECTRA 12            |    |       |     |      |      |      |
| RESOLUTION OF SPECTRA 1024 |    |       |     |      |      |      |

Page 1

LISTING  
INSTRUMENT NUMBER

Y  
1

REGISTRY

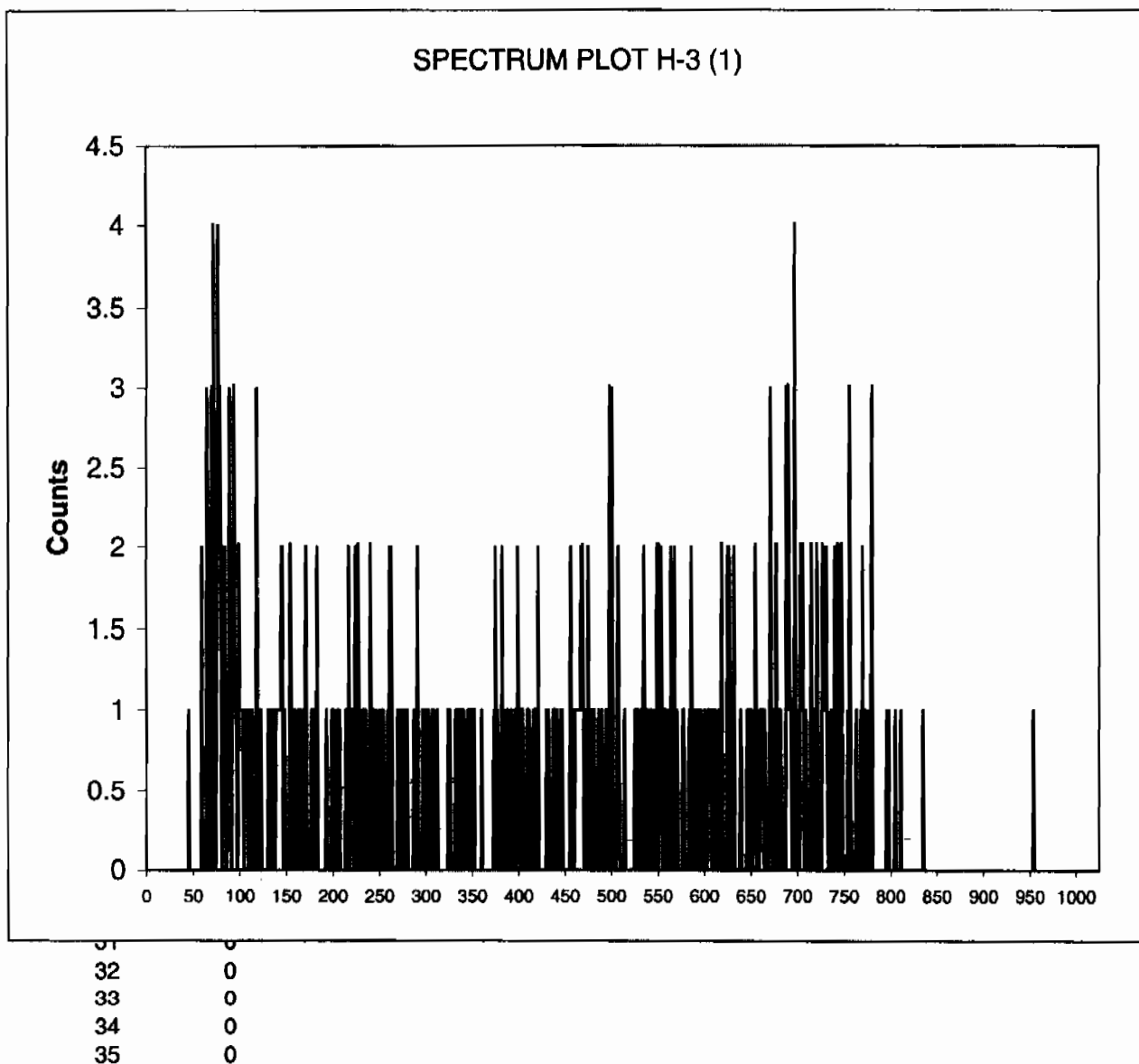
| POS                     | ID                     | CTIME            | SQP    | CPM1    | CPM2    | CPM3    |
|-------------------------|------------------------|------------------|--------|---------|---------|---------|
| Q013801N.001            | 15 MAR 2010            | 9:38             |        |         |         |         |
| 38                      | BKG                    | 50:01.780        | 732.56 | 1.86    | 3.06    | 7.91    |
| <del>Q023901N.001</del> | <del>15 MAR 2010</del> | <del>9:45</del>  |        |         |         |         |
| 39                      | 247774003              | 4:10.780         | 766.60 | 2467.18 | 2712.90 | 2717.55 |
| <del>Q034001N.001</del> | <del>15 MAR 2010</del> | <del>10:22</del> |        |         |         |         |
| 40                      | 247964001              | 35:00.780        | 763.08 | 3.18    | 4.38    | 8.88    |
| Q044101N.001            | 15 MAR 2010            | 11:00            |        |         |         |         |
| 41                      | 247964002              | 35:01.780        | 762.66 | 1.75    | 2.83    | 7.77    |
| Q054201N.001            | 15 MAR 2010            | 11:38            |        |         |         |         |
| 42                      | 247964003              | 35:01.780        | 761.36 | 1.81    | 2.77    | 7.42    |
| <del>Q064301N.001</del> | <del>15 MAR 2010</del> | <del>12:15</del> |        |         |         |         |
| 43                      | 247964004              | 35:01.780        | 761.06 | 1.95    | 3.21    | 8.21    |
| Q074401N.001            | 15 MAR 2010            | 13:08            |        |         |         |         |
| 44                      | 247964005              | 50:01.779        | 763.97 | 1.82    | 3.10    | 8.01    |
| Q084501N.001            | 15 MAR 2010            | 13:45            |        |         |         |         |
| 45                      | 247969001              | 35:01.779        | 764.73 | 1.87    | 3.06    | 7.77    |
| Q094601N.001            | 15 MAR 2010            | 14:23            |        |         |         |         |
| 46                      | 247969002              | 35:01.779        | 759.12 | 2.68    | 4.29    | 9.08    |
| Q104701N.001            | 15 MAR 2010            | 15:01            |        |         |         |         |
| 47                      | 247969003              | 35:01.779        | 756.76 | 1.43    | 2.68    | 7.53    |
| Q114801N.001            | 15 MAR 2010            | 15:38            |        |         |         |         |
| 48                      | 247969004              | 35:01.779        | 756.01 | 2.16    | 3.44    | 9.17    |
| Q124901N.001            | 15 MAR 2010            | 16:16            |        |         |         |         |
| 49                      | 247969005              | 35:01.779        | 758.97 | 1.43    | 2.68    | 7.56    |
| Q135001N.001            | 15 MAR 2010            | 16:53            |        |         |         |         |
| 50                      | 247969006              | 35:01.779        | 760.61 | 2.24    | 4.03    | 9.55    |
| Q145101N.001            | 15 MAR 2010            | 17:31            |        |         |         |         |
| 51                      | 247969007              | 35:01.778        | 761.87 | 1.81    | 2.92    | 8.50    |
| Q155201N.001            | 15 MAR 2010            | 18:23            |        |         |         |         |
| 52                      | 247969008              | 50:01.778        | 756.87 | 1.69    | 3.04    | 7.46    |
| Q165301N.001            | 15 MAR 2010            | 19:01            |        |         |         |         |
| 53                      | 248028001              | 35:01.778        | 761.41 | 2.57    | 4.03    | 9.75    |
| Q175401N.001            | 15 MAR 2010            | 19:38            |        |         |         |         |
| 54                      | 248028002              | 35:00.778        | 758.42 | 2.39    | 3.88    | 9.29    |
| Q185501N.001            | 15 MAR 2010            | 20:16            |        |         |         |         |
| 55                      | 248028003              | 35:01.777        | 760.82 | 2.62    | 4.14    | 9.43    |
| Q195601N.001            | 15 MAR 2010            | 20:53            |        |         |         |         |
| 56                      | 248028004              | 35:01.777        | 760.37 | 1.19    | 2.60    | 7.48    |
| Q205701N.001            | 15 MAR 2010            | 21:31            |        |         |         |         |
| 57                      | 248028005              | 35:01.777        | 760.94 | 2.39    | 3.71    | 8.76    |
| <del>Q215801N.001</del> | <del>15 MAR 2010</del> | <del>22:00</del> |        |         |         |         |
| 58                      | 1202068192             | 35:01.777        | 771.26 | 1.28    | 2.62    | 7.80    |
| Q225901N.001            | 15 MAR 2010            | 22:46            |        |         |         |         |
| 59                      | 1202068193             | 35:01.776        | 762.33 | 2.42    | 3.94    | 8.94    |
| Q236001N.001            | 15 MAR 2010            | 23:04            |        |         |         |         |
| 60                      | 1202068194             | 15:01.776        | 770.89 | 37.04   | 41.95   | 46.92   |

Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ013801N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 1, BKG, 50.02967:  
Quench: 732.56  
Start, End, X-Axis 50-175

Channel Counts

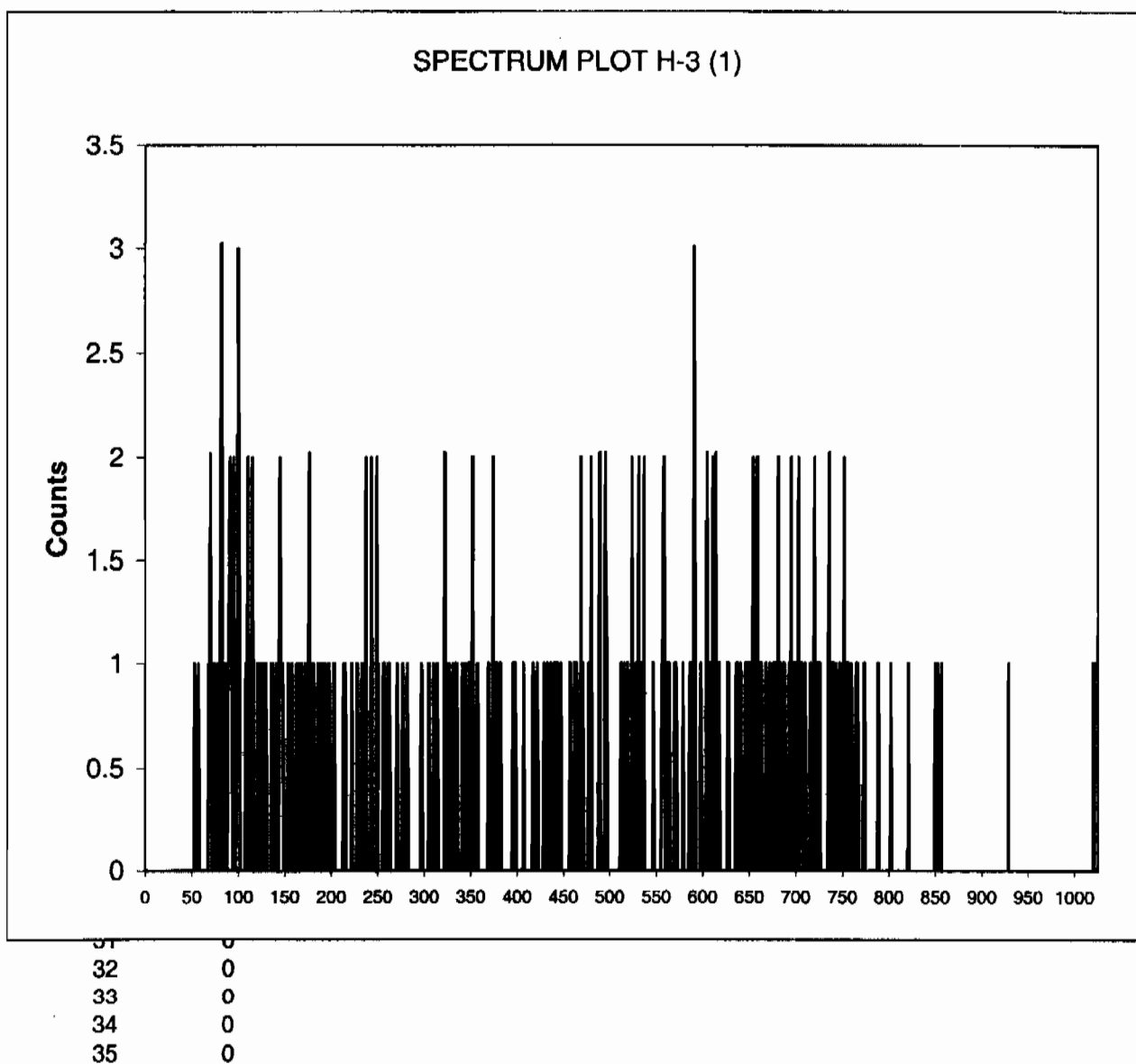


Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\scfiles\orange\964049A0\SQ044101N.001.xls  
File Info: s:\scfiles\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 4, 247964002, 35.02967:  
Quench: 762.66  
Start, End, X-Axis 50-175

Channel Counts



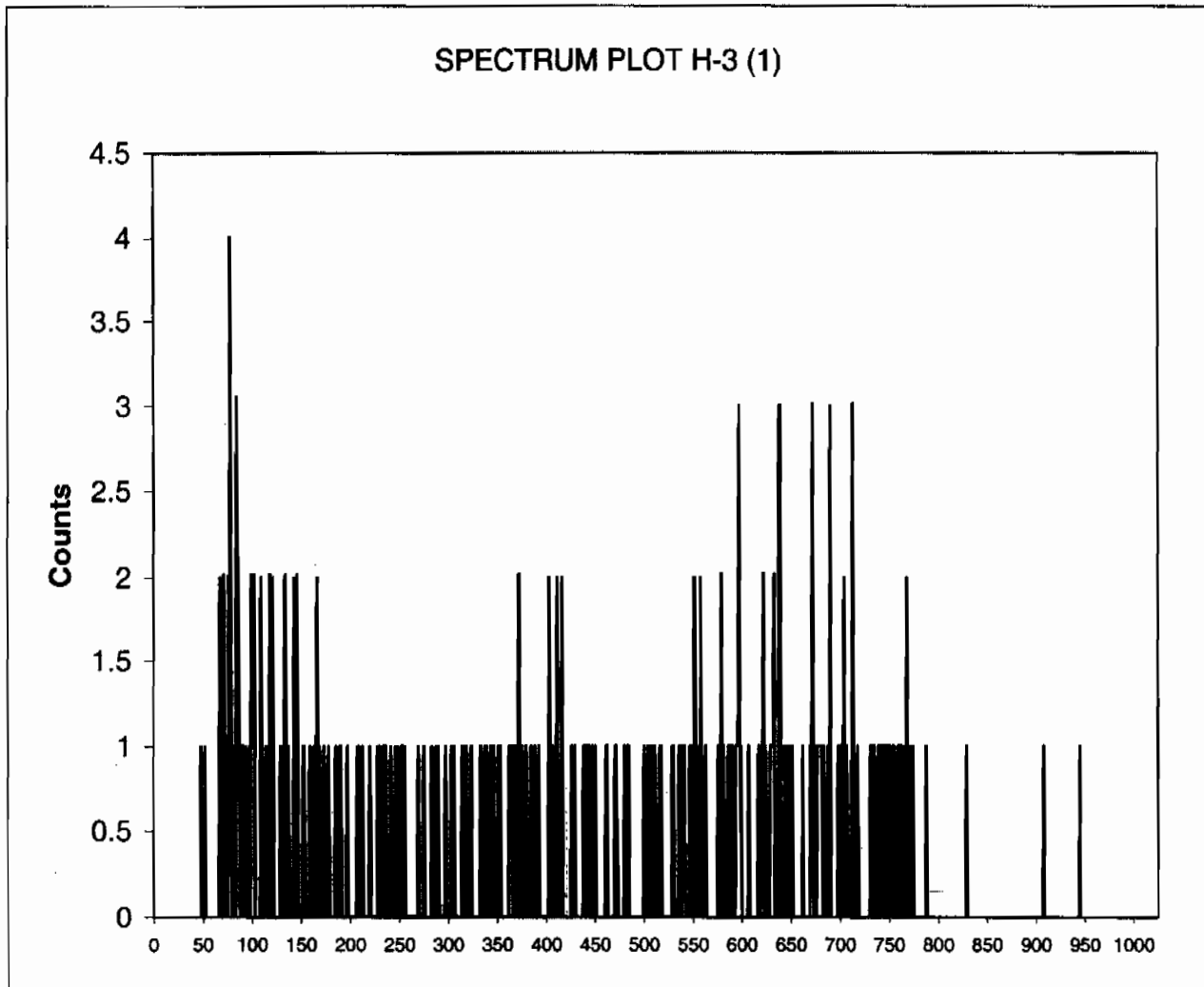
Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 15 MAR 2010 8:45  
s:\lsc\files\orange\964049A0\SQ054201N.001.xls  
s:\lsc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 5, 247964003, 35.02967:  
Quench: 761.36  
Start, End, X-Axis 50-175

Channel Counts



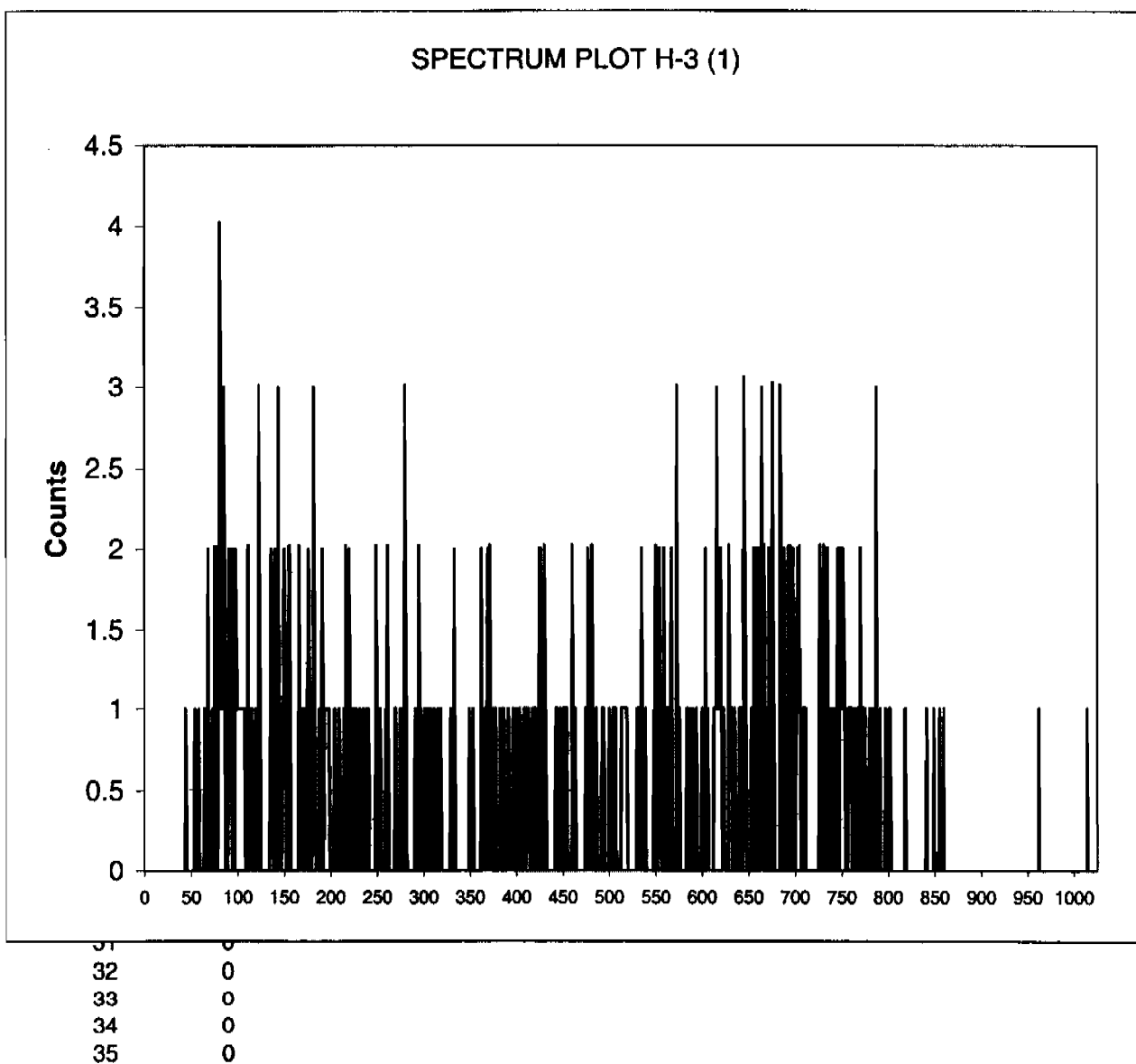
|    |   |
|----|---|
| 31 | 0 |
| 32 | 0 |
| 33 | 0 |
| 34 | 0 |
| 35 | 0 |

Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ074401N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 7, 247964005, 50.02965:  
Quench: 763.97  
Start, End, X-Axis 50-175

Channel Counts





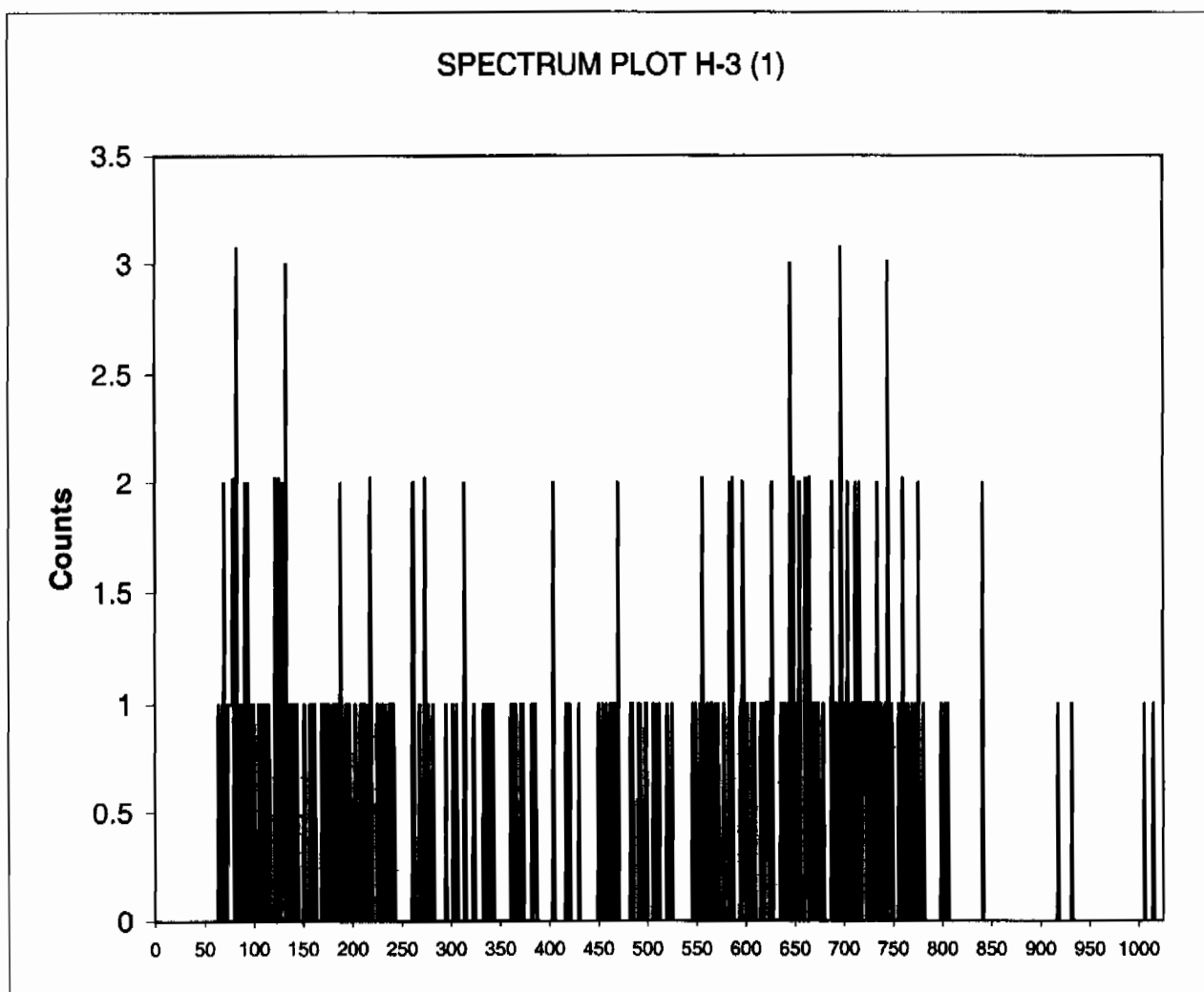
Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 15 MAR 2010 8:45  
s:\sc\files\orange\964049A0\SQ084501N.001.xls  
s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 8, 247969001, 35.02965:  
Quench: 764.73  
Start, End, X-Axis 50-175

Channel Counts



31 0  
32 0  
33 0  
34 0  
35 0

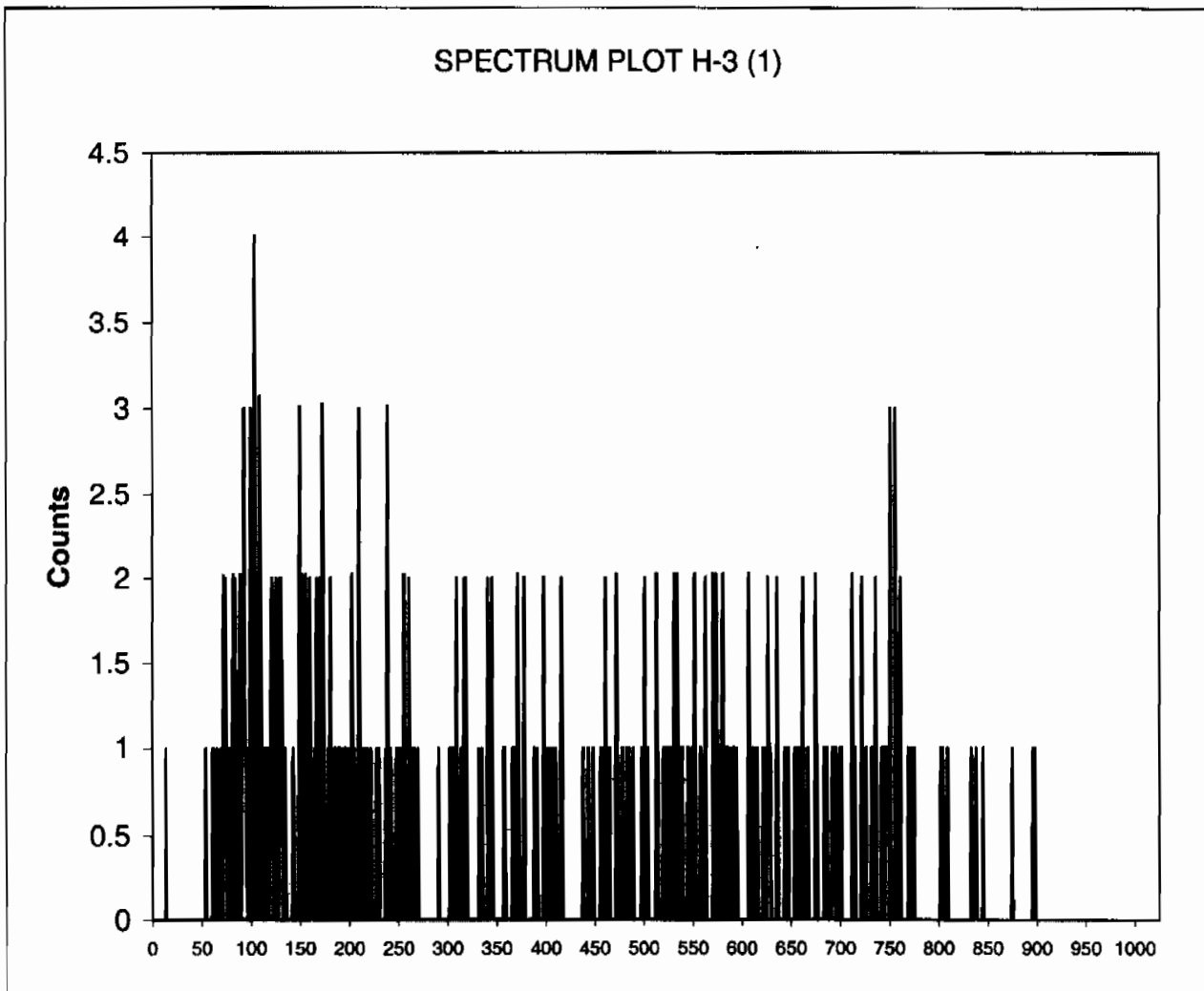
Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 15 MAR 2010 8:45  
s:\sc\files\orange\964049A0\SQ094601N.001.xls  
s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 9, 247969002, 35.02965:  
Quench: 759.12  
Start, End, X-Axis 50-175

Channel Counts



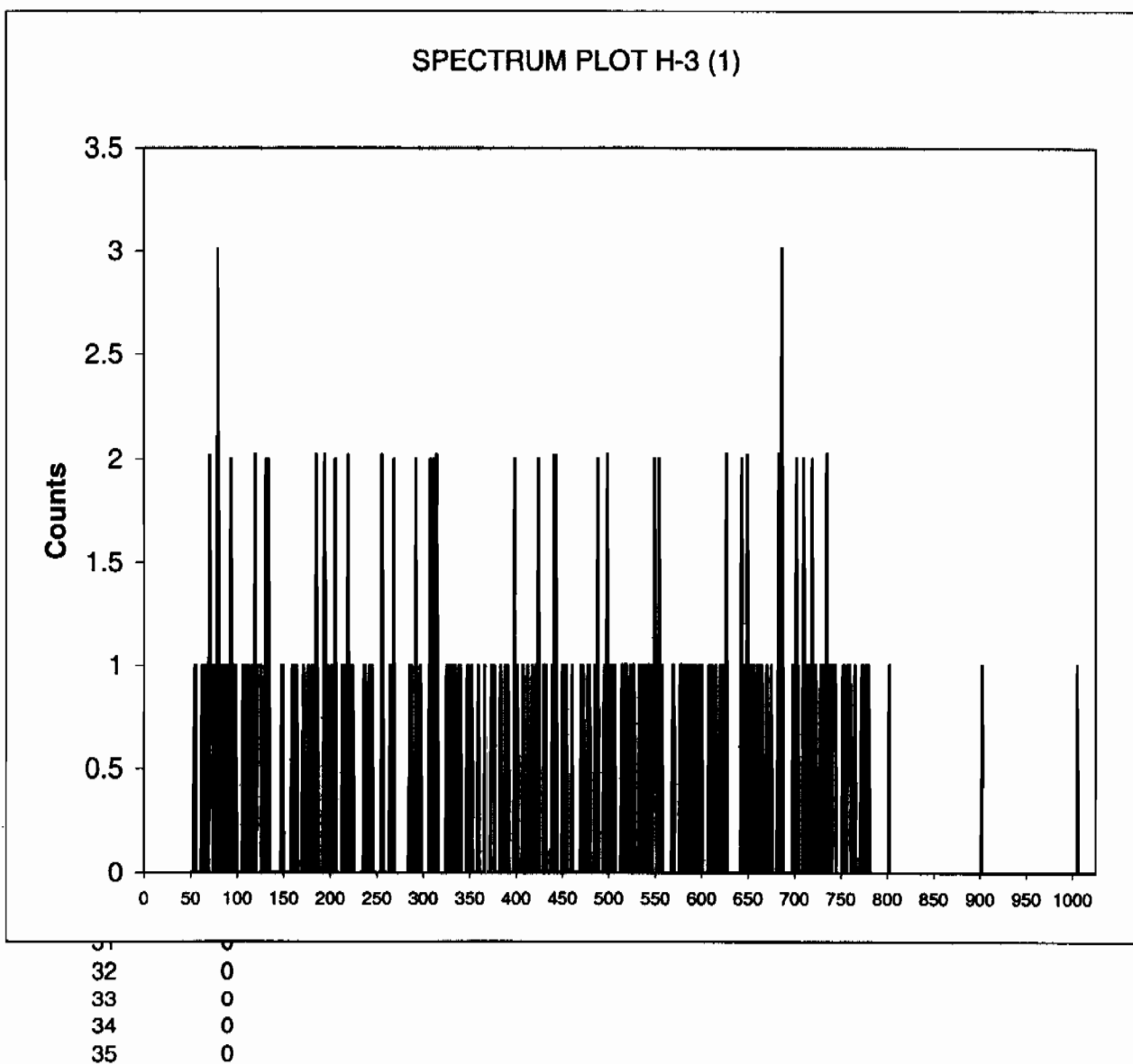
31 0  
32 0  
33 0  
34 0  
35 0

Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\lsc\files\orange\964049A0\SQ104701N.001.xls  
File Info: s:\lsc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 10, 247969003, 35.02965:  
Quench: 756.76  
Start, End, X-Axis 50-175

Channel Counts

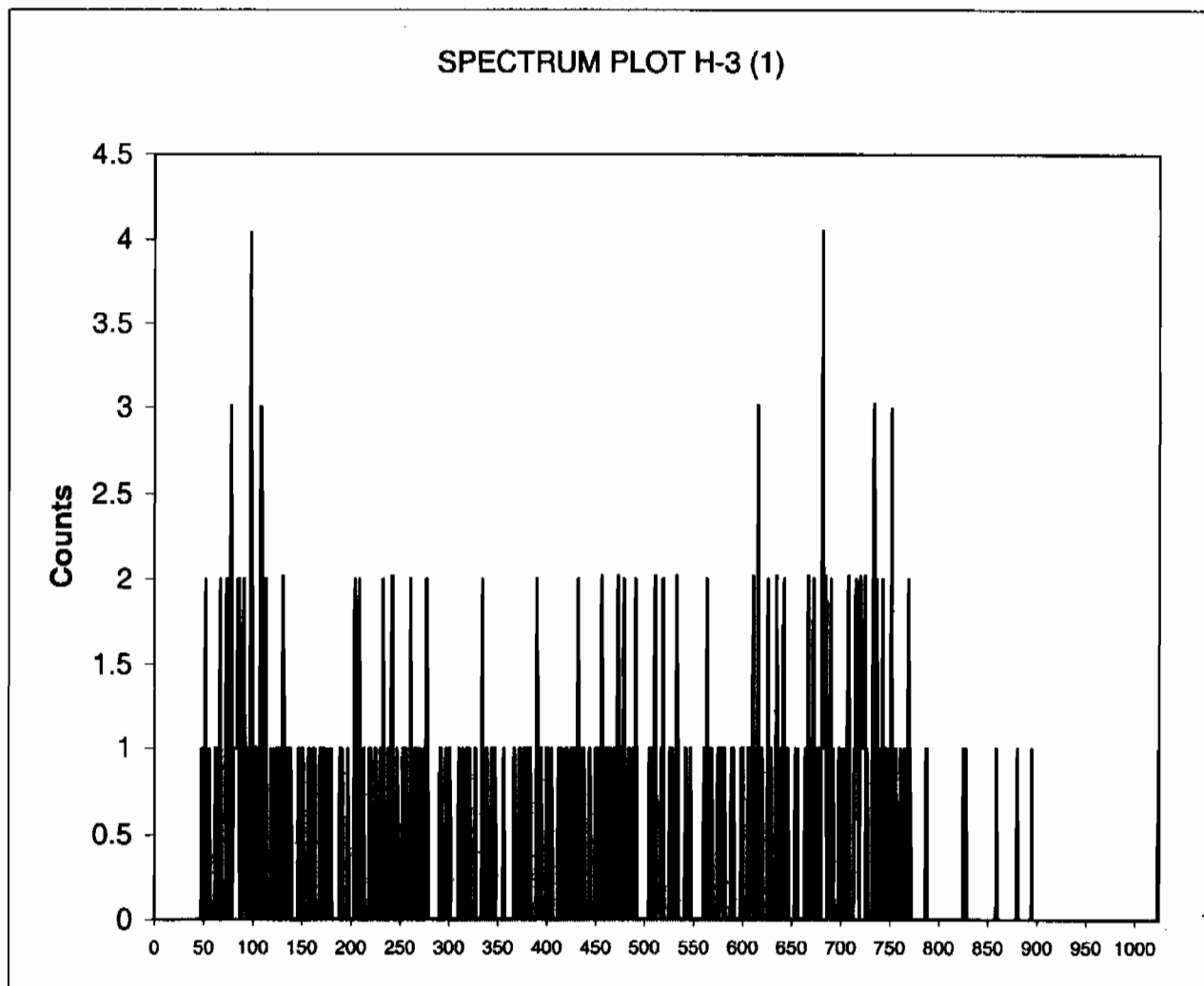


Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ114801N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 11, 247969004, 35.02965:  
Quench: 756.01  
Start, End, X-Axis 50-175

Channel Counts



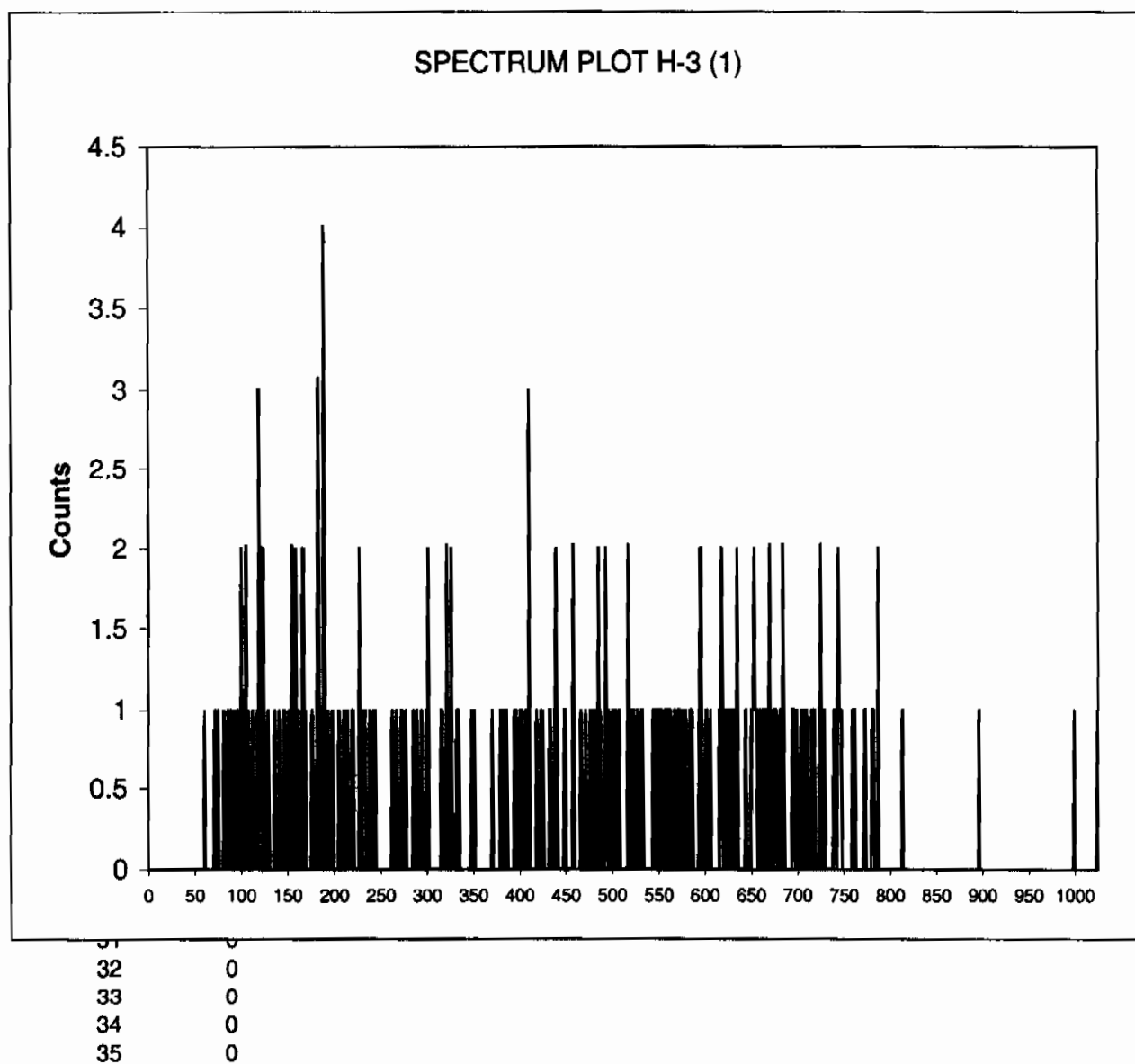
|    |   |
|----|---|
| 31 | 0 |
| 32 | 0 |
| 33 | 0 |
| 34 | 0 |
| 35 | 0 |

Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ124901N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 12, 247969005, 35.02965:  
Quench: 758.97  
Start, End, X-Axis: 50-175

Channel Counts



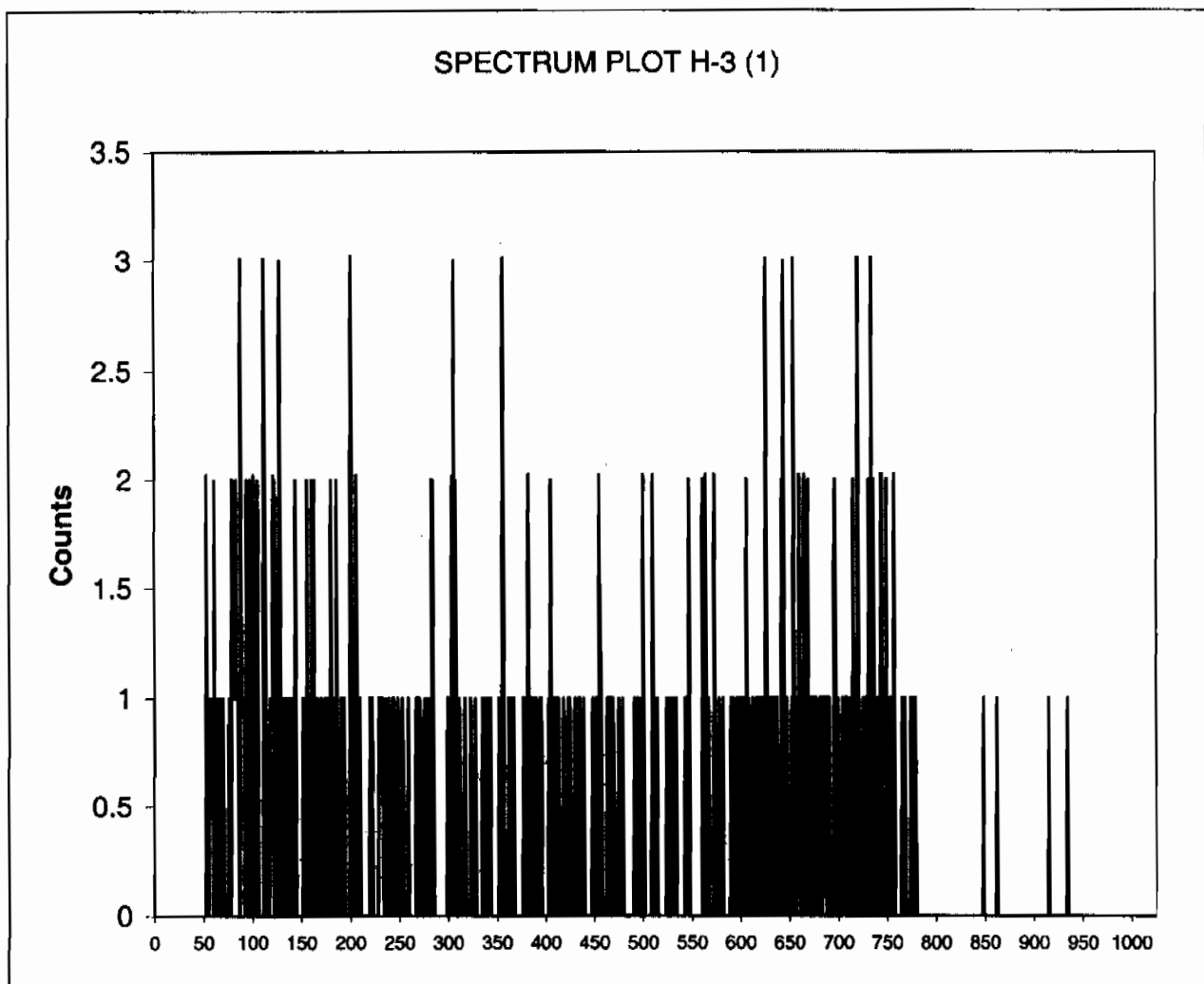
Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 15 MAR 2010 8:45  
s:\sc\files\orange\964049A0\SQ135001N.001.xls  
s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 13, 247969006, 35.02965:  
Quench: 760.61  
Start, End, X-Axis 50-175

Channel Counts



31 0  
32 0  
33 0  
34 0  
35 0

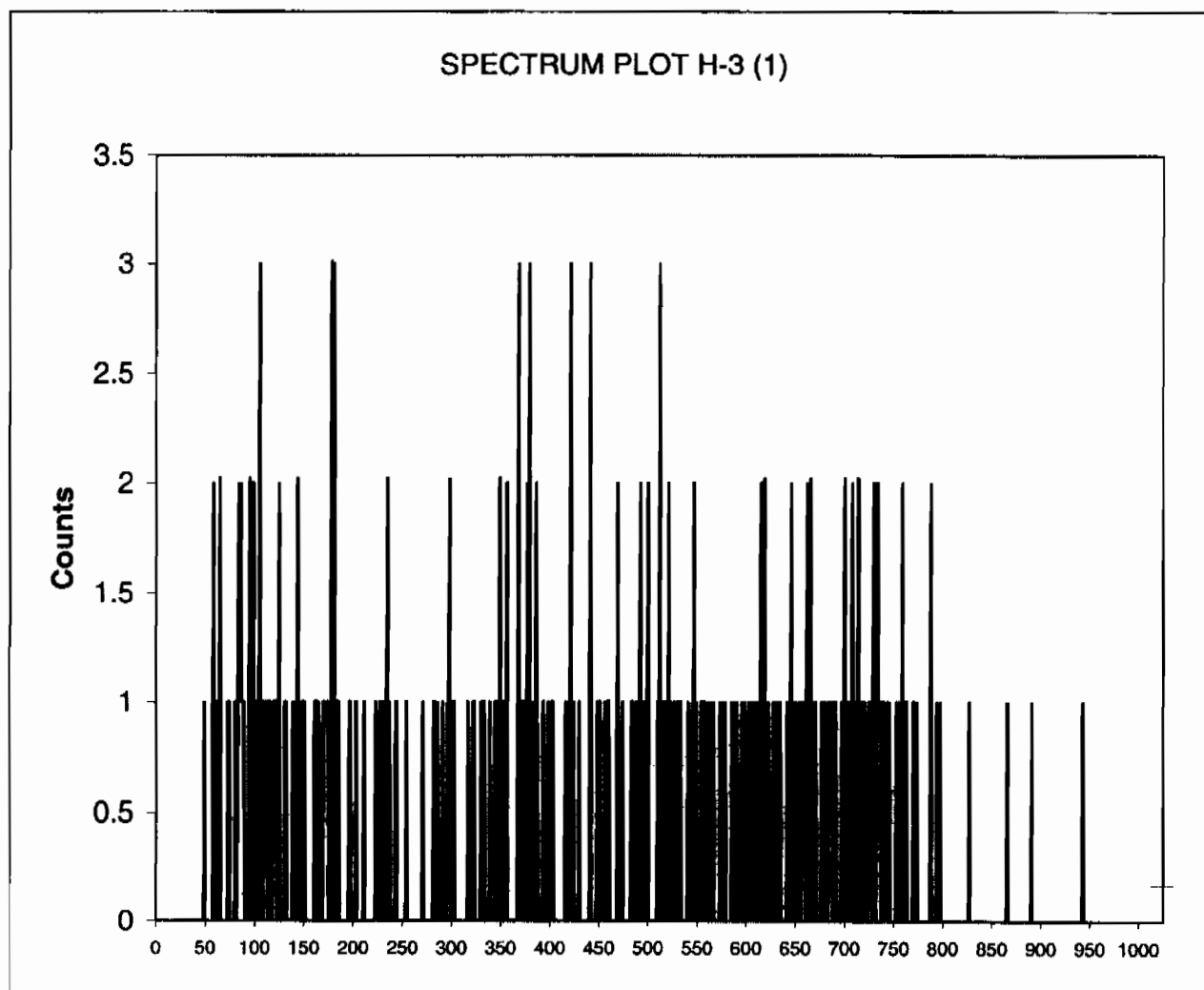
Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 15 MAR 2010 8:45  
s:\sc\files\orange\964049A0\SQ145101N.001.xls  
s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 14, 247969007, 35.02963:  
Quench: 761.87  
Start, End, X-Axis 50-175

Channel Counts



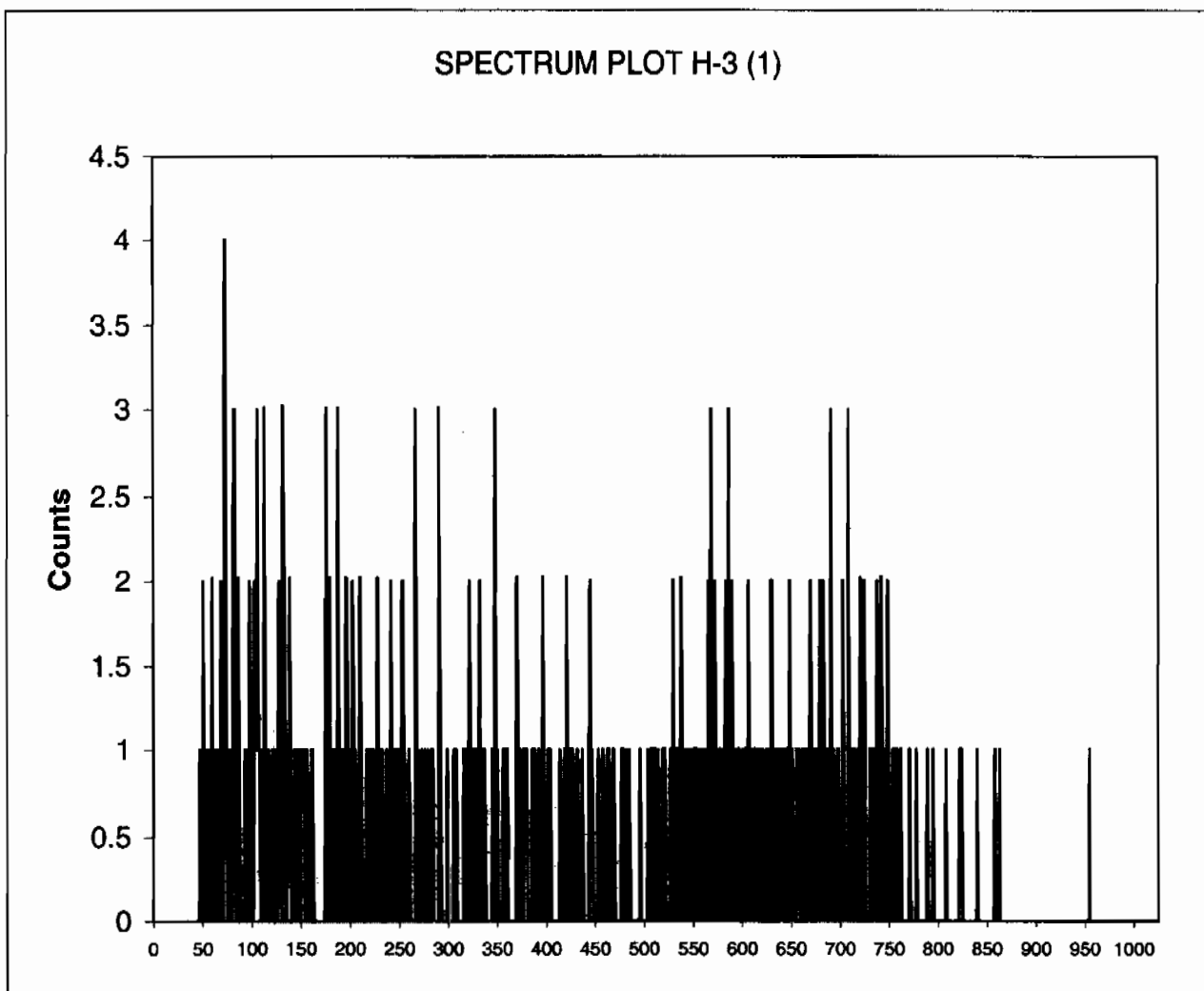
31 0  
32 0  
33 0  
34 0  
35 0

Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ155201N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 15, 247969008, 50.02963:  
Quench: 756.87  
Start, End, X-Axis 50-175

Channel Counts



31 0  
32 0  
33 0  
34 0  
35 0

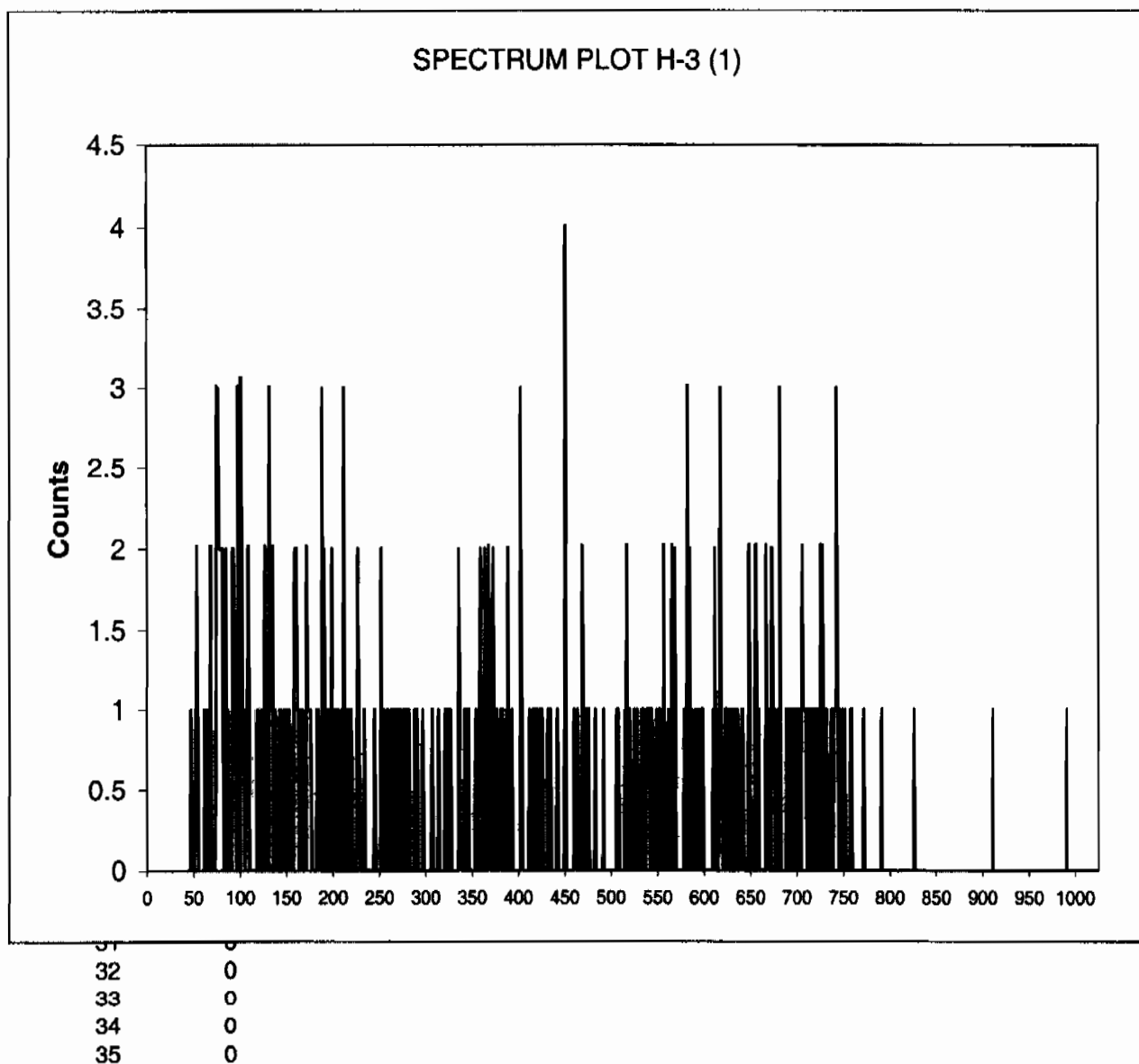


Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ165301N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 16, 248028001, 35.02963:  
Quench: 761.41  
Start, End, X-Axis 50-175

Channel Counts

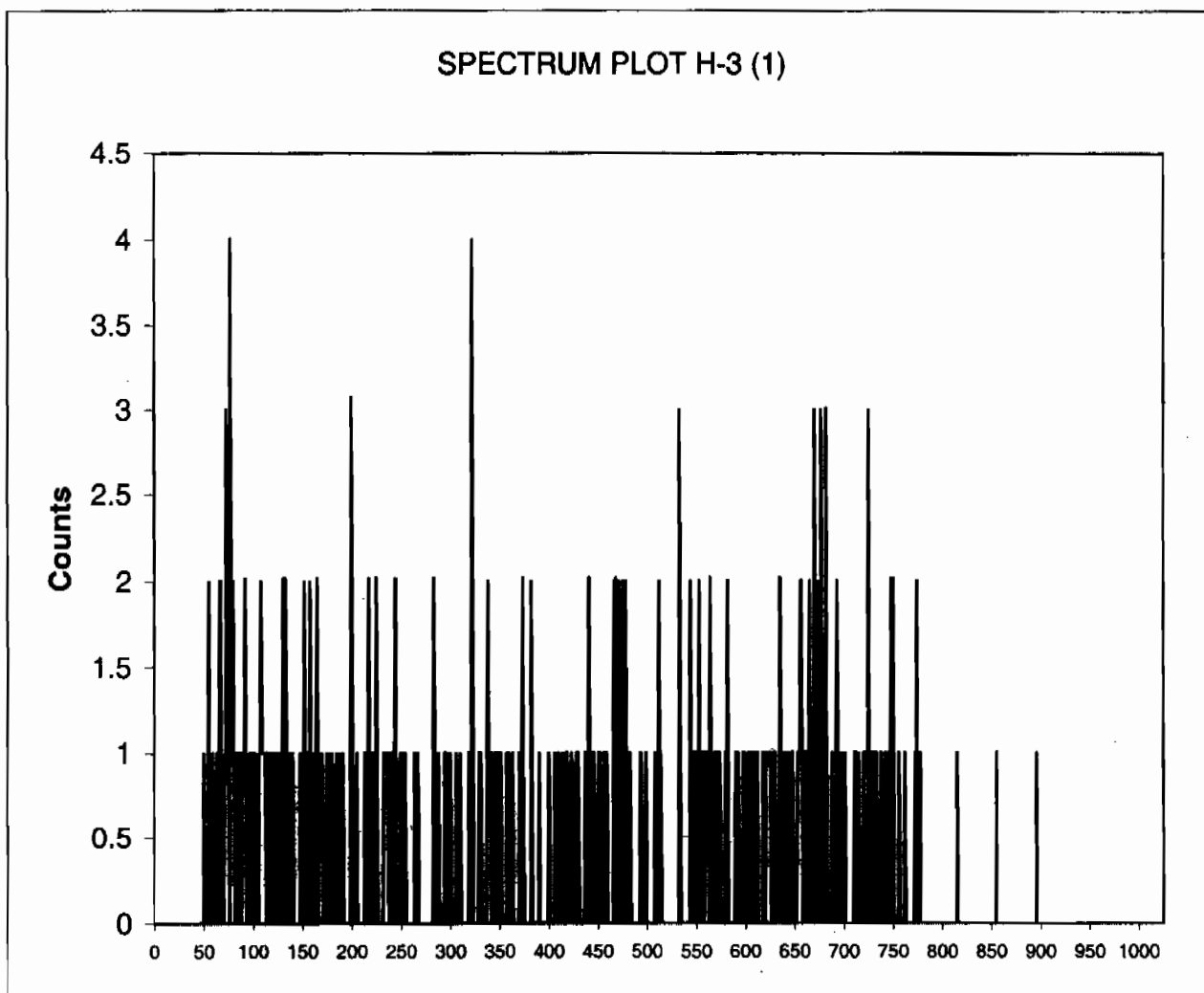


Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ175401N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 17, 248028002, 35.01297:  
Quench: 758.42  
Start, End, X-Axis 50-175

Channel Counts



|    |   |
|----|---|
| 31 | 0 |
| 32 | 0 |
| 33 | 0 |
| 34 | 0 |
| 35 | 0 |

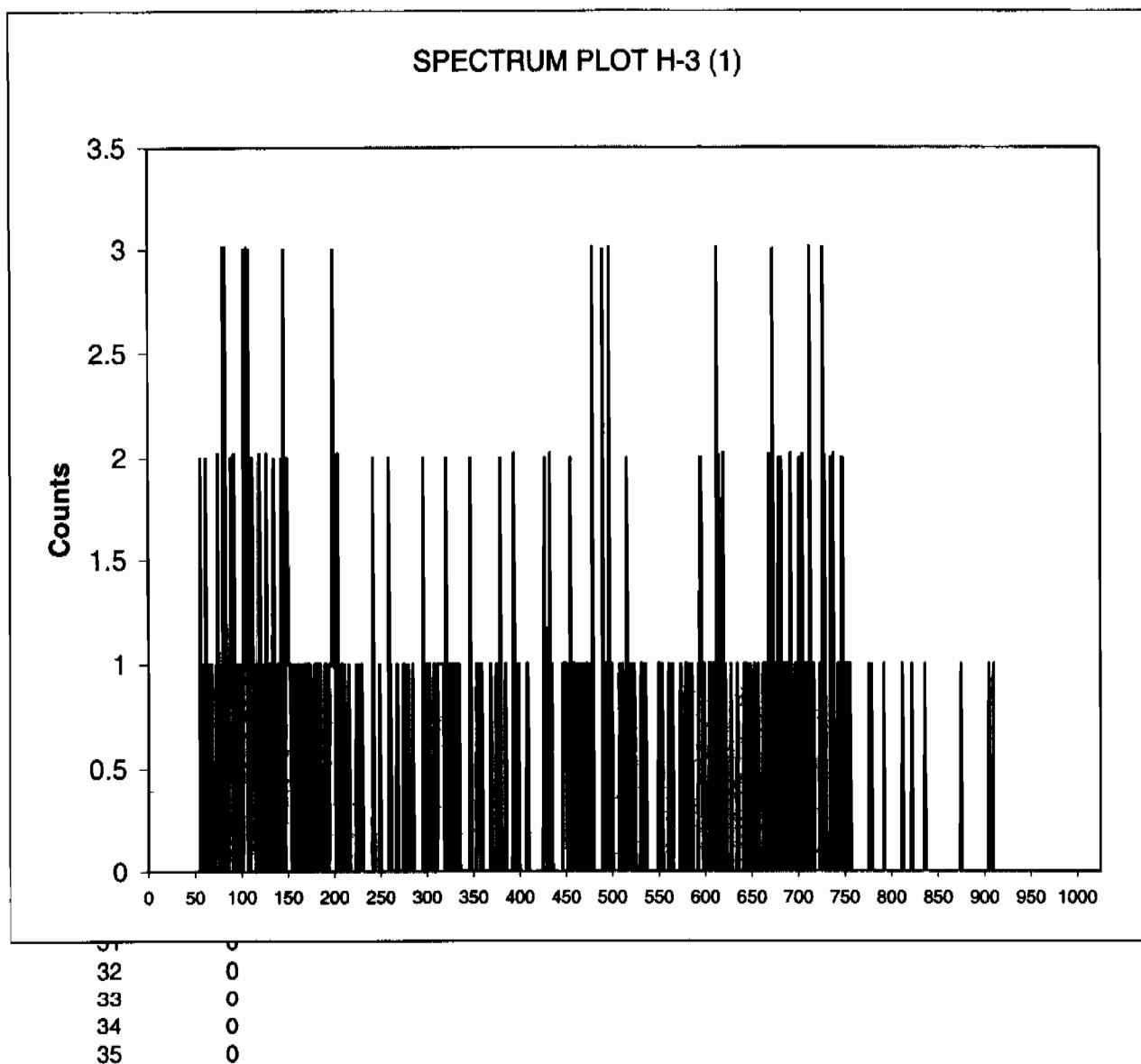
Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 15 MAR 2010 8:45  
s:\sc\files\orange\964049A0\SQ185501N.001.xls  
s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 18, 248028003, 35.02962:  
Quench: 760.82  
Start, End, X-Axis 50-175

Channel Counts

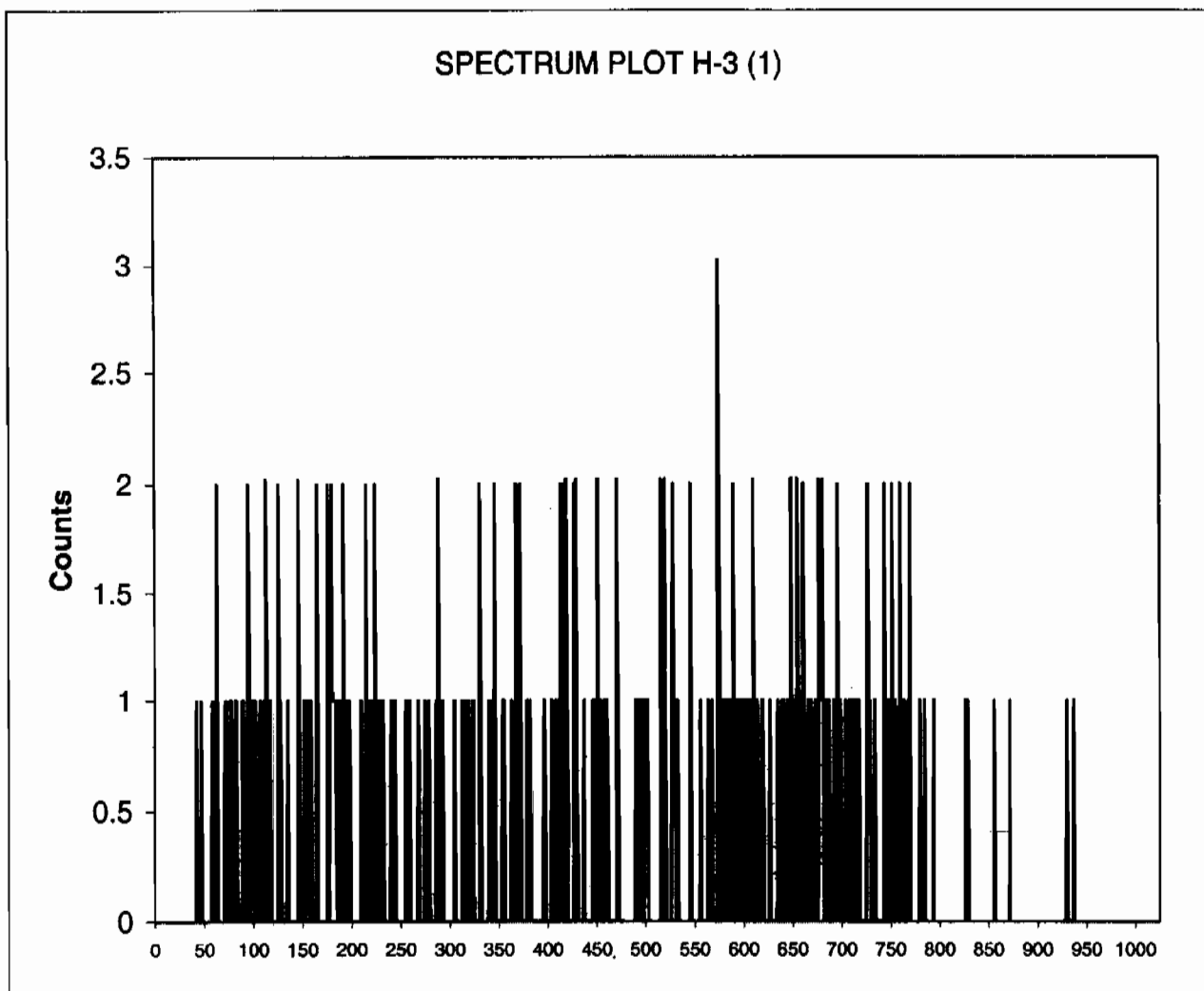


Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ195601N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 19, 248028004, 35.02962:  
Quench: 760.37  
Start, End, X-Axis 50-175

Channel Counts



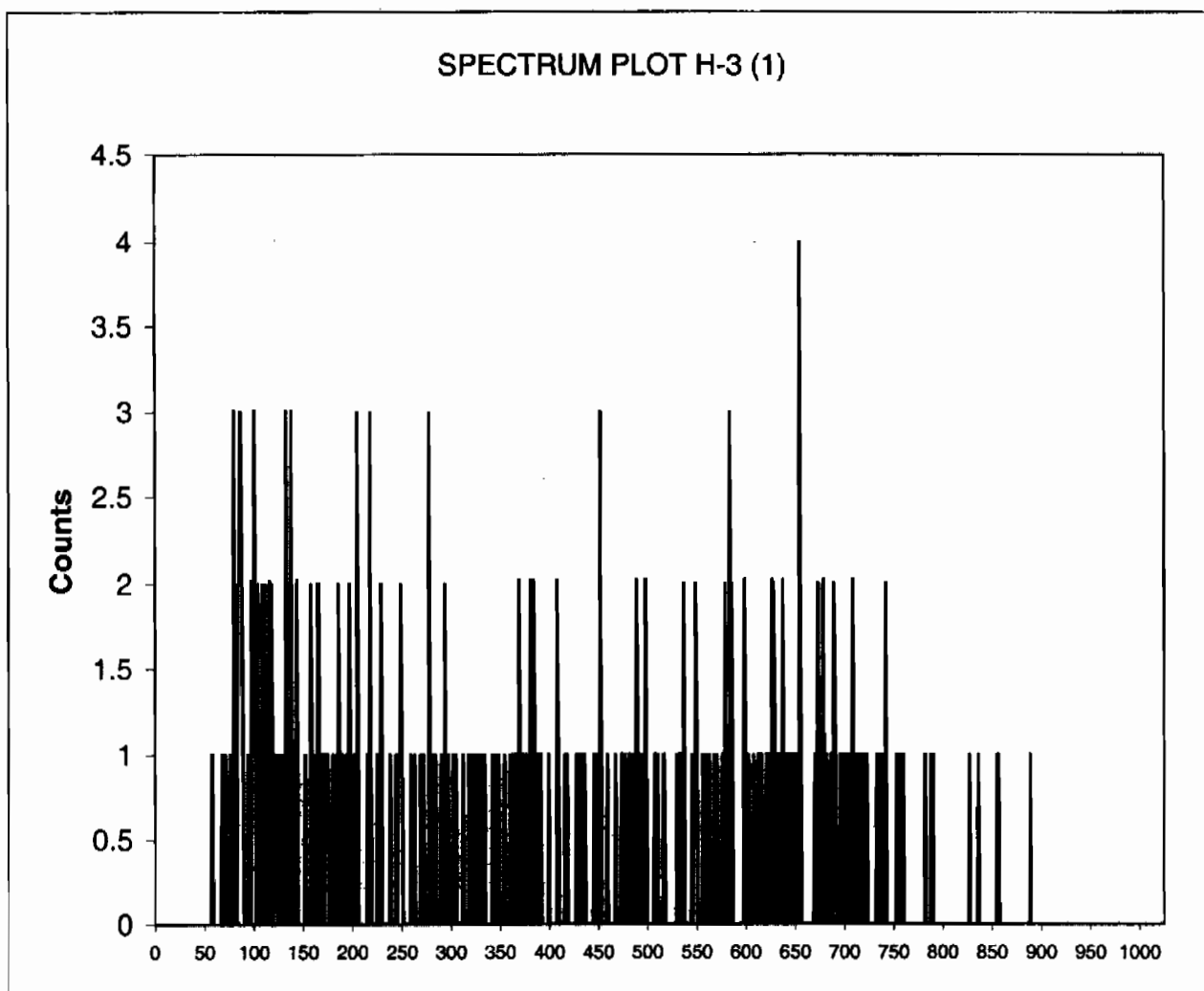
31 0  
32 0  
33 0  
34 0  
35 0

Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ205701N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 20, 248028005, 35.02962:  
Quench: 760.94  
Start, End, X-Axis 50-175

Channel Counts



31 0  
32 0  
33 0  
34 0  
35 0

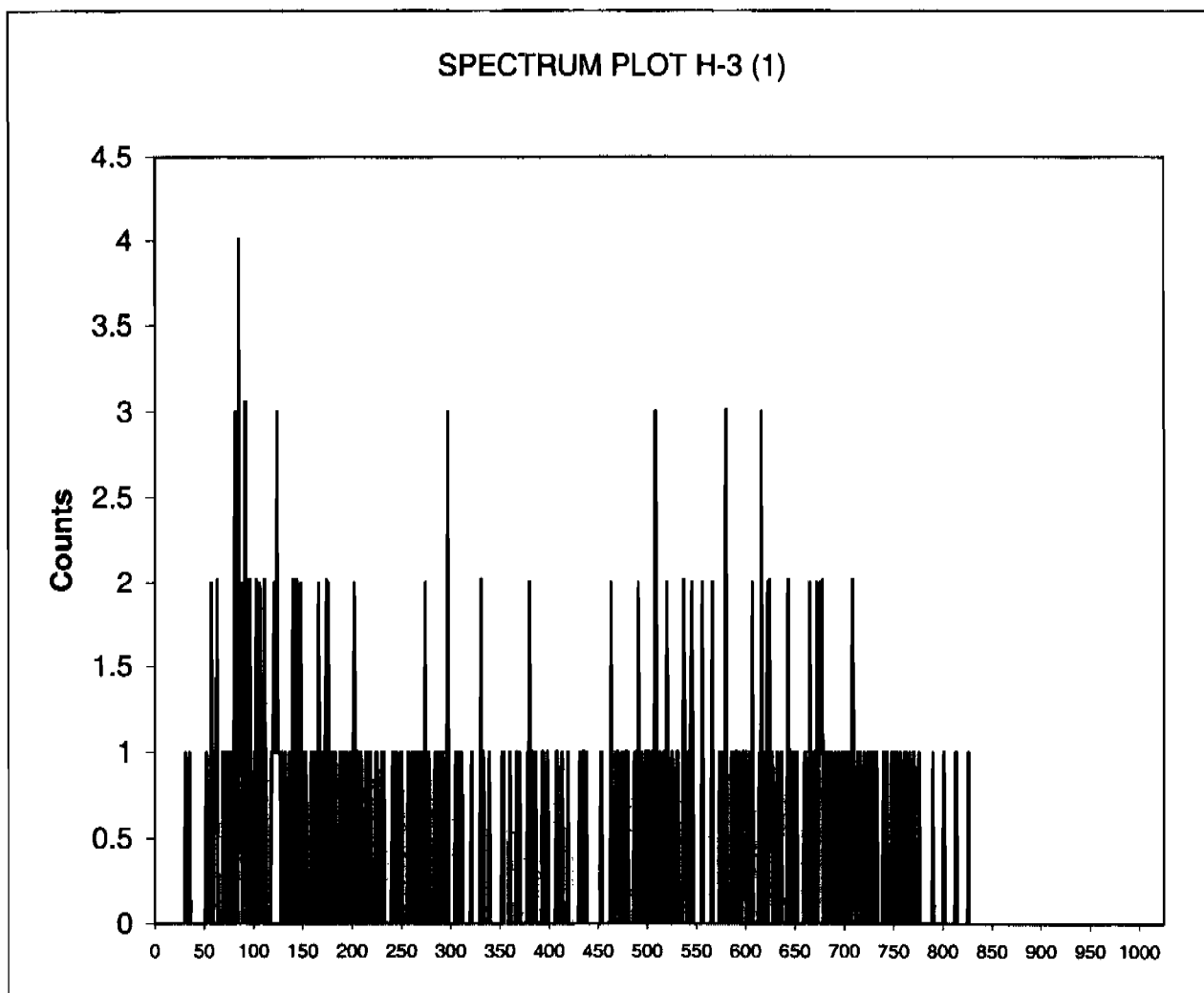
Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 15 MAR 2010 8:45  
s:\sc\files\orange\964049A0\SQ225901N.001.xls  
s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 22, 1202068193, 35.0296:  
Quench: 762.33  
Start, End, X-Axis 50-175

Channel Counts

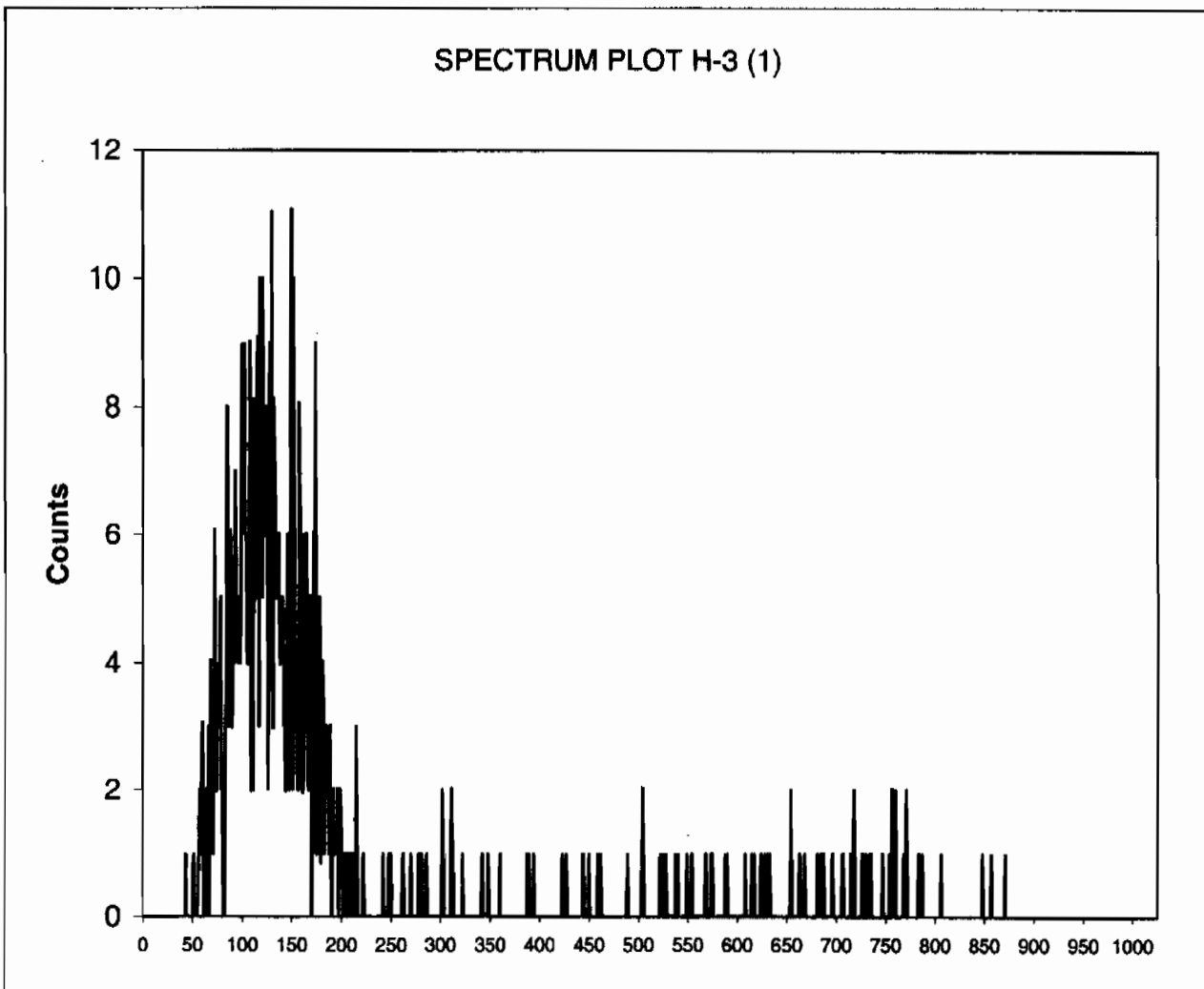


Instrument Type: Quantulus  
Data Capture Date: MON 15 MAR 2010 8:45  
FileName: s:\sc\files\orange\964049A0\SQ236001N.001.xls  
File Info: s:\sc\files\orange\964049A0\U964049A0.xls

ID: H-3 (1)  
Comments: ORANGE

Sample, Rack-Pos, Time: 23, 1202068194, 15.0296:  
Quench: 770.89  
Start, End, X-Axis 50-175

Channel Counts



|    |   |
|----|---|
| 31 | 0 |
| 32 | 0 |
| 33 | 0 |
| 34 | 0 |
| 35 | 0 |

PROTOCOL : 10 H-3 120 min  
DATE : 2010/03/17  
TIME : 13:21  
ID : P10AS259

## H-3

Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : DPM  
Quench Index : SQP(E)  
Isotope(s) : H3  
H3 = ,12.43 y  
Protocol name : H-3 120 min  
Counting time : 7200  
Repeats : 1  
Cycles : 1  
Replicates : 1  
2 sigma % : 0.00  
Minimum cpm : 0.00 Checking time: 10  
Sp. library of Isotope H3 : Wallac  
Vial type : Diffuse  
Liquid system : HiSafe  
Advanced modes : Chemlum  
Output to Display :  
POS,DPM1,CPMw2,CLMM,FNCT2,  
RACK,RACKPOS,FNCT1,SQPE,DATE,  
TIME,CPMw1,CPM,CPM1,CTIME  
Additions to Display : Listing,Header,Spectrum  
Header : H-3  
Spectrum : Rnd.Cos,Beta  
Window 1 : 25- 190 /Beta  
Window 2 : 25- 190 /Rnd.Cos  
Window 3 : 1-1024 /Beta  
Window 4 : 1-1024 /Beta  
Window 5 : 1-1024 /Beta  
Window 6 : 1-1024 /Beta  
FNCT1 = FNCT1 : CTIME/60  
FNCT2 = FNCT2 : CPMW1-CPMW2  
FNCT3 = FNCT3 :  
FNCT4 = FNCT4 :

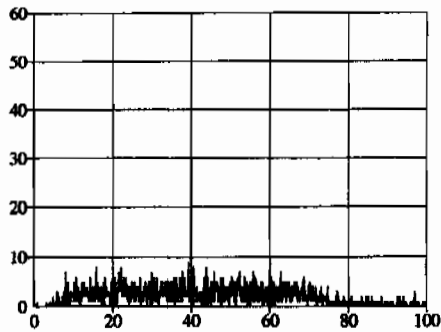
Total activity:

H3 20.6 DPM 0.000 kBq



H-3

6kg Rack\_position 58 1 Count\_Time(min) 120.00 Quench\_number 734.15 H-3\_CPM 2.69 Run\_Date 3/17/2010 1:21 PM



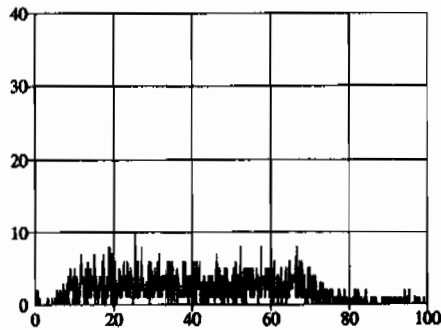
Counts  
Chem

Counts  
Beta

Gross\_B\_CPM 2.80 LUMEX 0.00

Lumex\_CPM 0.10 DPM 10.40

MB Rack\_position 58 2 Count\_Time(min) 120.00 Quench\_number 729.69 H-3\_CPM 2.53 Run\_Date 3/17/2010 3:23 PM



Counts  
Chem

Counts  
Beta

Gross\_B\_CPM 2.60 LUMEX 0.00

Lumex\_CPM 0.10 DPM 10.20

## ID: TRITIUM

19 MAR 2010 12:39

USER: 5

COMMENT: GOLD

PRESET TIME : 120.00

|               |        |                            |     |                 |   |           |      |
|---------------|--------|----------------------------|-----|-----------------|---|-----------|------|
| DATA CALC :   | CPM    | H# :                       | YES | SAMPLE REPEATS: | 1 | PRINTER : | STD  |
| COUNT BLANK : | NO     | IC# :                      | NO  | REPLICATES :    | 1 | RS232 :   | EDIT |
| TWO PHASE :   | NO     | AQC :                      | NO  | CYCLE REPEATS : | 1 | DISK :    | OFF  |
| SCINTILLATOR: | LIQUID | LUMEX:                     | YES | LOW SAMPLE REJ: | 0 |           |      |
| LOW LEVEL :   | NO     | HALF LIFE CORRECTION DATE: |     |                 |   | none      |      |

CHAN: 0.0 - 235.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 1000.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

| SAM<br>NO | POS | TIME<br>MIN | H# | WIND1 |        | WIND2 |        | LUMEX<br>% | ELAPSED<br>TIME |
|-----------|-----|-------------|----|-------|--------|-------|--------|------------|-----------------|
|           |     |             |    | CPM   | %ERROR | CPM   | %ERROR |            |                 |

|   |      |        |       |      |       |       |      |      |        |
|---|------|--------|-------|------|-------|-------|------|------|--------|
| 1 | 47-1 | 120.00 | 118.1 | 2.72 | 11.56 | 44.54 | 2.74 | 0.60 | 123.12 |
| 2 | 47-2 | 120.00 | 117.3 | 3.27 | 10.29 | 42.72 | 2.80 | 0.37 | 246.70 |
| 5 | 47-3 | 120.00 | 117.3 | 3.09 | 10.52 | 44.72 | 2.73 | 0.24 | 370.20 |

MISSING SAMPLE

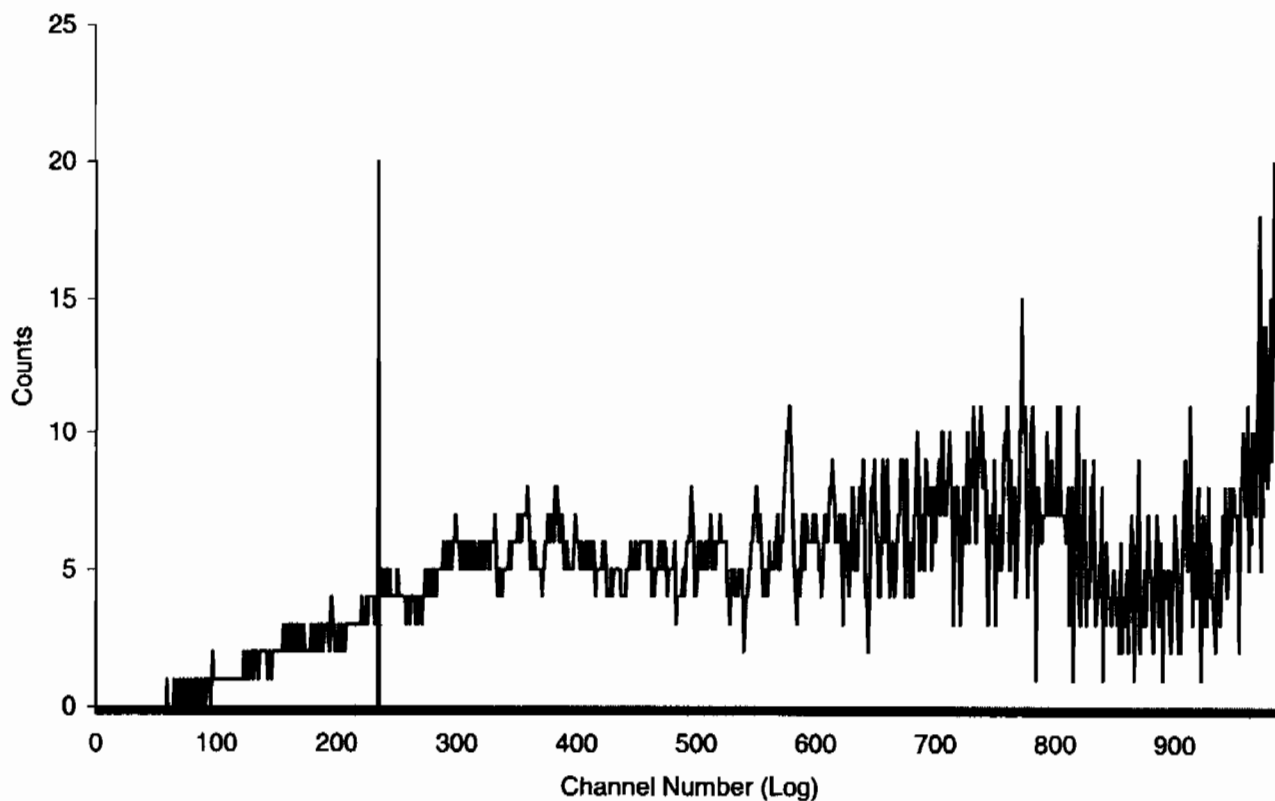
|   |      |  |  |  |  |  |  |  |  |
|---|------|--|--|--|--|--|--|--|--|
| 7 | 47-7 | INVALID SAMPLE COUNT: HW ABORT: COUNT RATE TOO LOW |  |  |  |  |  |  |  |
| 8 | 47-8 | INVALID SAMPLE COUNT: HW ABORT: COUNT RATE TOO LOW |  |  |  |  |  |  |  |
| 9 | 47-9 | INVALID SAMPLE COUNT: HW ABORT: COUNT RATE TOO LOW |  |  |  |  |  |  |  |

17 3/23/10

|                                     |                      |      |        |
|-------------------------------------|----------------------|------|--------|
| Sample Count Start Time:            | 19 Mar 2010 12:41:56 |      |        |
| Data Capture Date                   | 19 Mar 2010 14:42:23 |      |        |
| User Filename                       | S05031947-1A.XLS     |      |        |
|                                     | U05031947-1A.XLS     |      |        |
| Spectrum Type                       | Log Counts           |      |        |
| User Number                         | 05                   |      |        |
| User Id                             | TRITIUM              |      |        |
| User Comment                        | GOLD                 |      |        |
| Scintillator                        | LIQUID               |      |        |
| Sample, Rack-Pos, Time:             | 1                    | 47-1 | 120.00 |
| H#, Total Counts:                   | 118.1                | 5625 |        |
| Win1: Tritium - Start, End, Counts: | 0                    | 235  | 330    |
| Win2: - Start, End, Counts:         | 0                    | 990  | 4841   |

### SPECTRUM PLOT

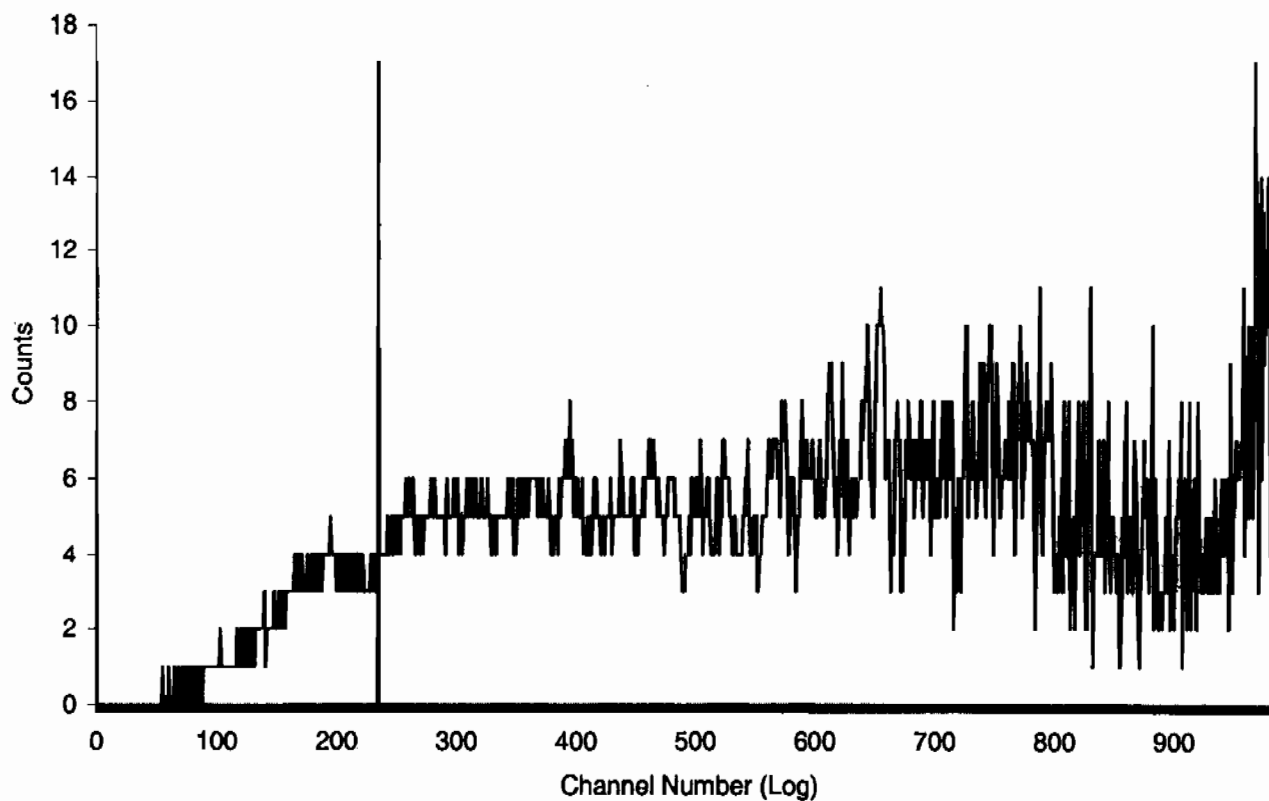
USER 05 - TRITIUM



|                                     |                      |      |        |
|-------------------------------------|----------------------|------|--------|
| Sample Count Start Time:            | 19 Mar 2010 14:45:31 |      |        |
| Data Capture Date                   | 19 Mar 2010 16:45:58 |      |        |
| User Filename                       | S05031947-2A.XLS     |      |        |
|                                     | U05031947-1A.XLS     |      |        |
| Spectrum Type                       | Log Counts           |      |        |
| User Number                         | 05                   |      |        |
| User Id                             | TRITIUM              |      |        |
| User Comment                        | GOLD                 |      |        |
| Scintillator                        | LIQUID               |      |        |
| Sample, Rack-Pos, Time:             | 2                    | 47-2 | 120.00 |
| H#, Total Counts:                   | 117.3                | 5542 |        |
| Win1: Tritium - Start, End, Counts: | 0                    | 235  | 396    |
| Win2: - Start, End, Counts:         | 0                    | 990  | 4663   |

# SPECTRUM PLOT

USER 05 - TRITIUM



# REGISTRY

MON 22 MAR 2010 16:49

\*\*\* DIRECTORY PATH :S:\LSC\O\DA\964049A1 \*\*\*

PARAMETER GROUP: 8  
ID: H-3 (2)

00A PROGRAM MODE 6 ->

| ORDER | POS | ID        | CTIME | COUNTS | CUCNTS | MCW | REP | STD | STMS | STIME |
|-------|-----|-----------|-------|--------|--------|-----|-----|-----|------|-------|
| 1     | 39  | BKG       | 60:00 | 1.0E04 | NO LIM | 1   | 1   | Y   | 1/10 | 1:00  |
| 2     | 40  | 247964005 | 60:00 | 1.0E04 | NO LIM | 1   | 1   | Y   | 1/10 | 1:00  |

NUMBER OF CYCLES 1  
COINCIDENCE BIAS (L/H) L

| MCA INPUT | TRIGG. | INHIBIT | MEMORY SPLIT |
|-----------|--------|---------|--------------|
| 1 LRSUM   | DCOS   | G       | L*R          |
| 2 GSUM    | G      |         | L*R          |

| WINDOW | CHANNELS | MCA | HALF |
|--------|----------|-----|------|
| 1      | 50- 175  | 1   | 2    |
| 2      | 5- 320   | 1   | 2    |
| 3      | 1- 1024  | 1   | 2    |
| 4      | 50- 320  | 1   | 1    |
| 5      | 50- 270  | 1   | 1    |
| 6      | 60- 220  | 1   | 1    |
| 7      | 1- 1024  | 2   | 1    |
| 8      | 1- 1024  | 2   | 2    |

SELECTED PRINTOUT FOR TERMINAL 1 (A)

SELECTED PRINTOUT FOR TERMINAL 2 (B)

| 1.<br>POS                  | 2.<br>ID | 3.<br>CTIME | 4.<br>SQP | 5.<br>CPM1 | 6.<br>CPM2 | 7.<br>CPM3 |
|----------------------------|----------|-------------|-----------|------------|------------|------------|
| SEND SPECTRA 12            |          |             |           |            |            |            |
| RESOLUTION OF SPECTRA 1024 |          |             |           |            |            |            |
| LISTING Y                  |          |             |           |            |            |            |
| INSTRUMENT NUMBER 1        |          |             |           |            |            |            |

| POS          | ID          | CTIME     | SQP    | CPM1 | CPM2 | CPM3 |
|--------------|-------------|-----------|--------|------|------|------|
| Q013901N.001 | 22 MAR 2010 | 17:52     |        |      |      |      |
| 39           | BKG         | 60:01.780 | 761.94 | 1.04 | 2.13 | 7.53 |
| Q024001N.001 | 22 MAR 2010 | 18:54     |        |      |      |      |
| 40           | 247964005   | 60:01.780 | 759.63 | 1.43 | 3.10 | 8.25 |

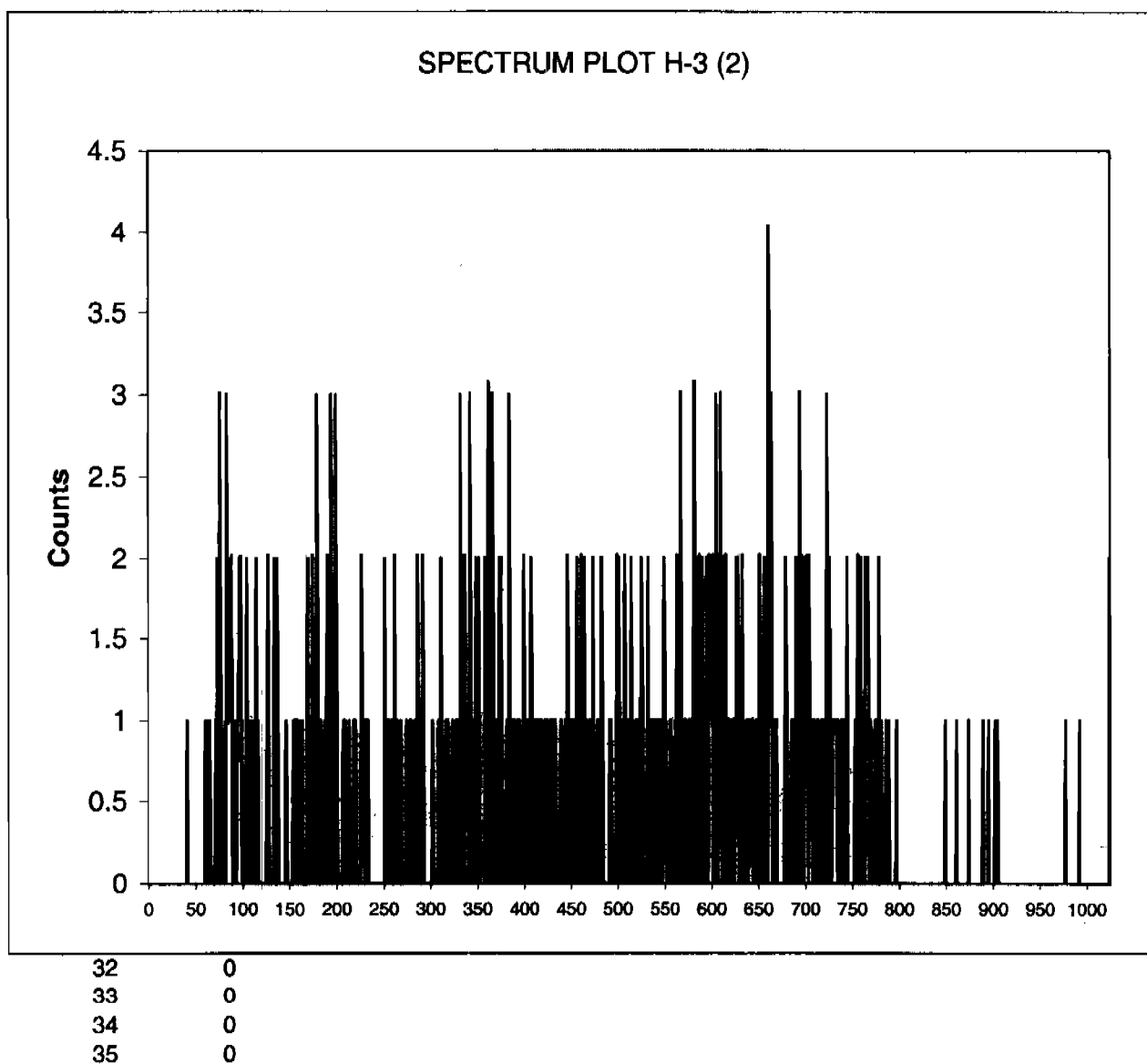
Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 22 MAR 2010 16:49  
s:\sc\files\orange\964049A1\SQ013901N.001.xls  
s:\sc\files\orange\964049A1\U964049A1.xls

ID: H-3 (2)  
Comments: ORANGE

Sample, Rack-Pos, Time: 1, BKG, 60.02967:  
Quench: 761.94  
Start, End, X-Axis 50-175

Channel Counts



Instrument Type:  
Data Capture Date:  
FileName:  
File Info:

Quantulus  
MON 22 MAR 2010 16:49  
s:\scfiles\orange\964049A1\SQ024001N.001.xls  
s:\scfiles\orange\964049A1\U964049A1.xls

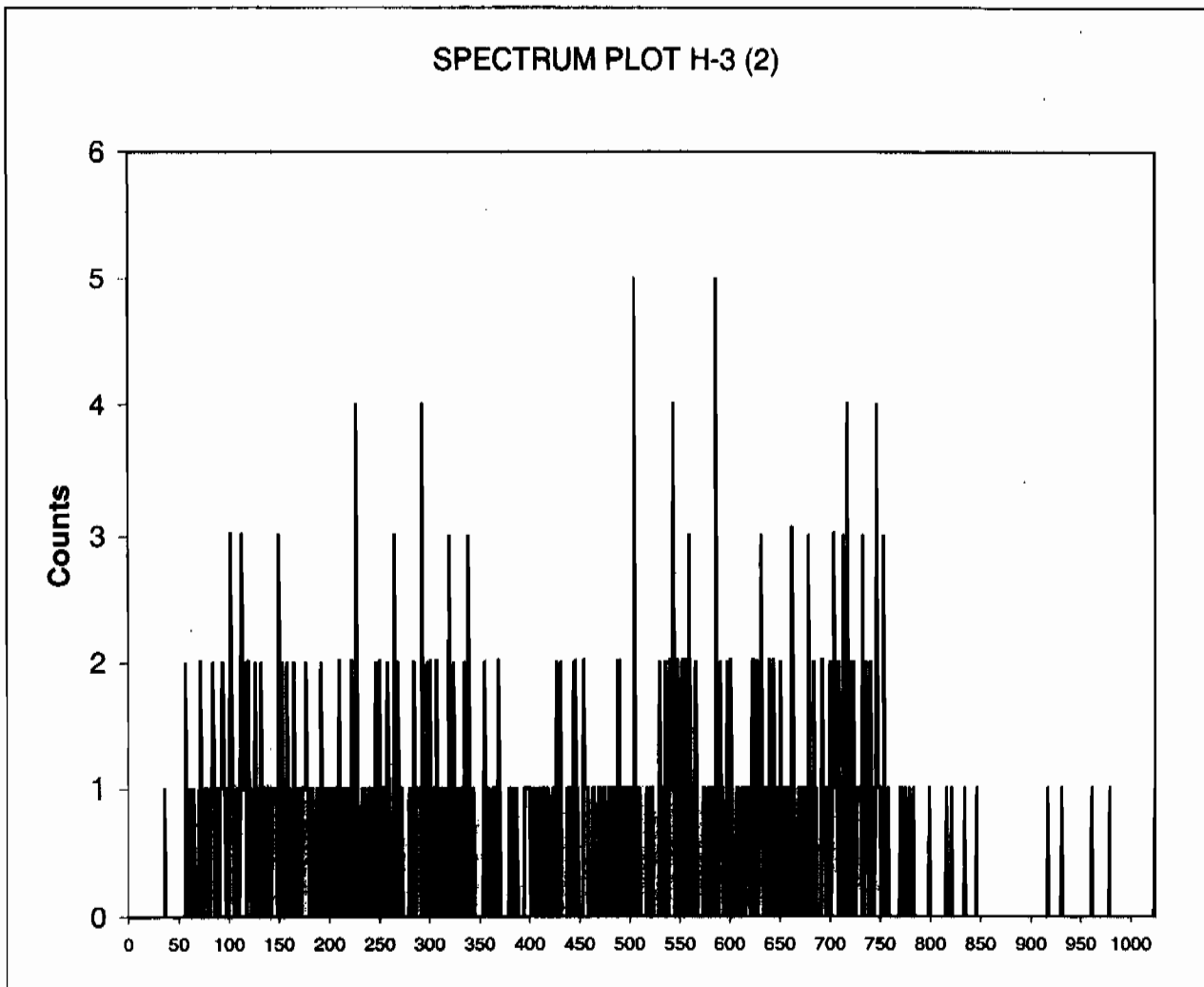
ID:  
Comments:

H-3 (2)  
ORANGE

Sample, Rack-Pos, Time:  
Quench:  
Start, End, X-Axis

2, 247964005, 60.02967:  
759.63  
50-175

Channel    Counts

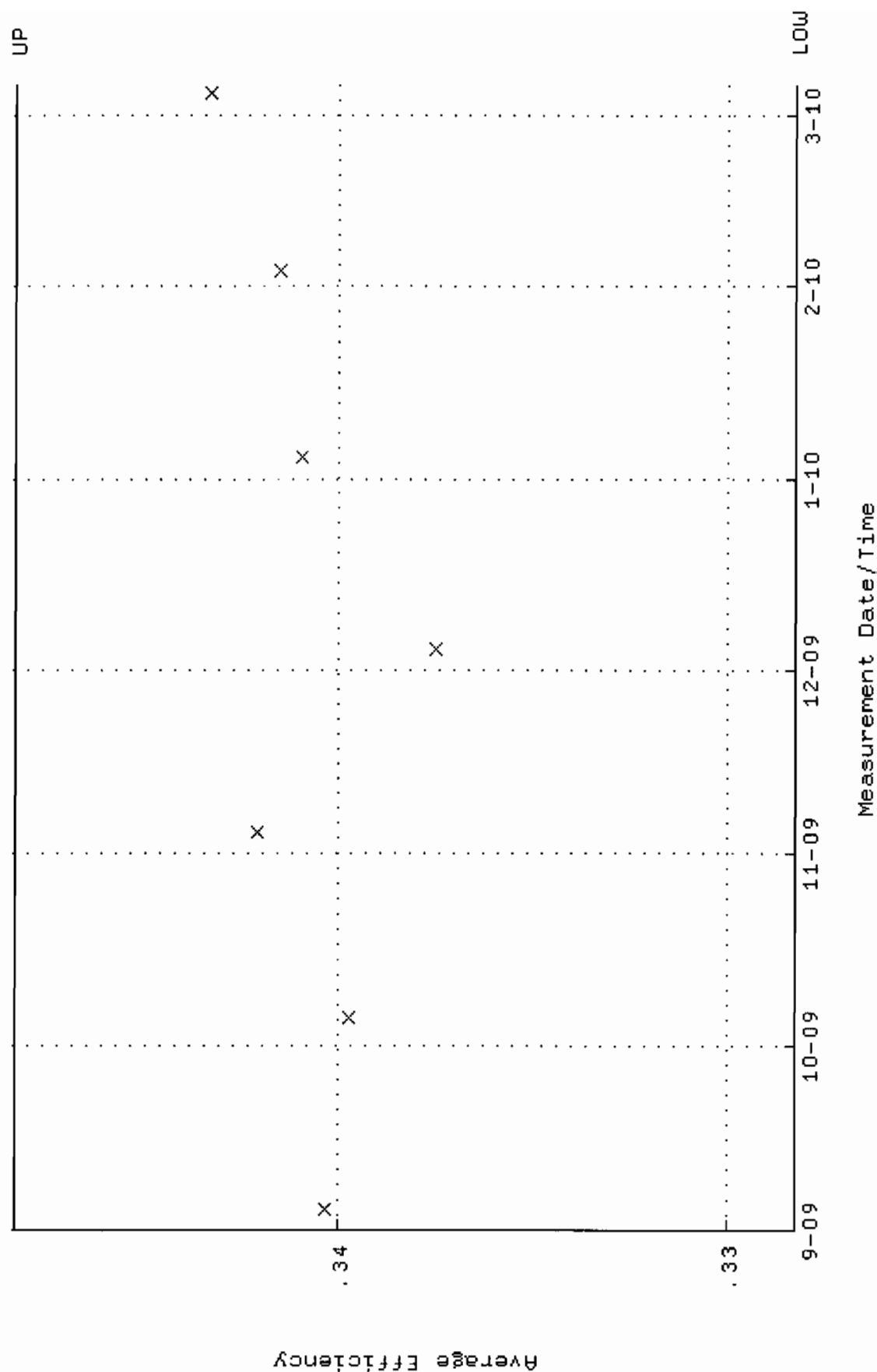


|    |   |
|----|---|
| 32 | 0 |
| 33 | 0 |
| 34 | 0 |
| 35 | 0 |

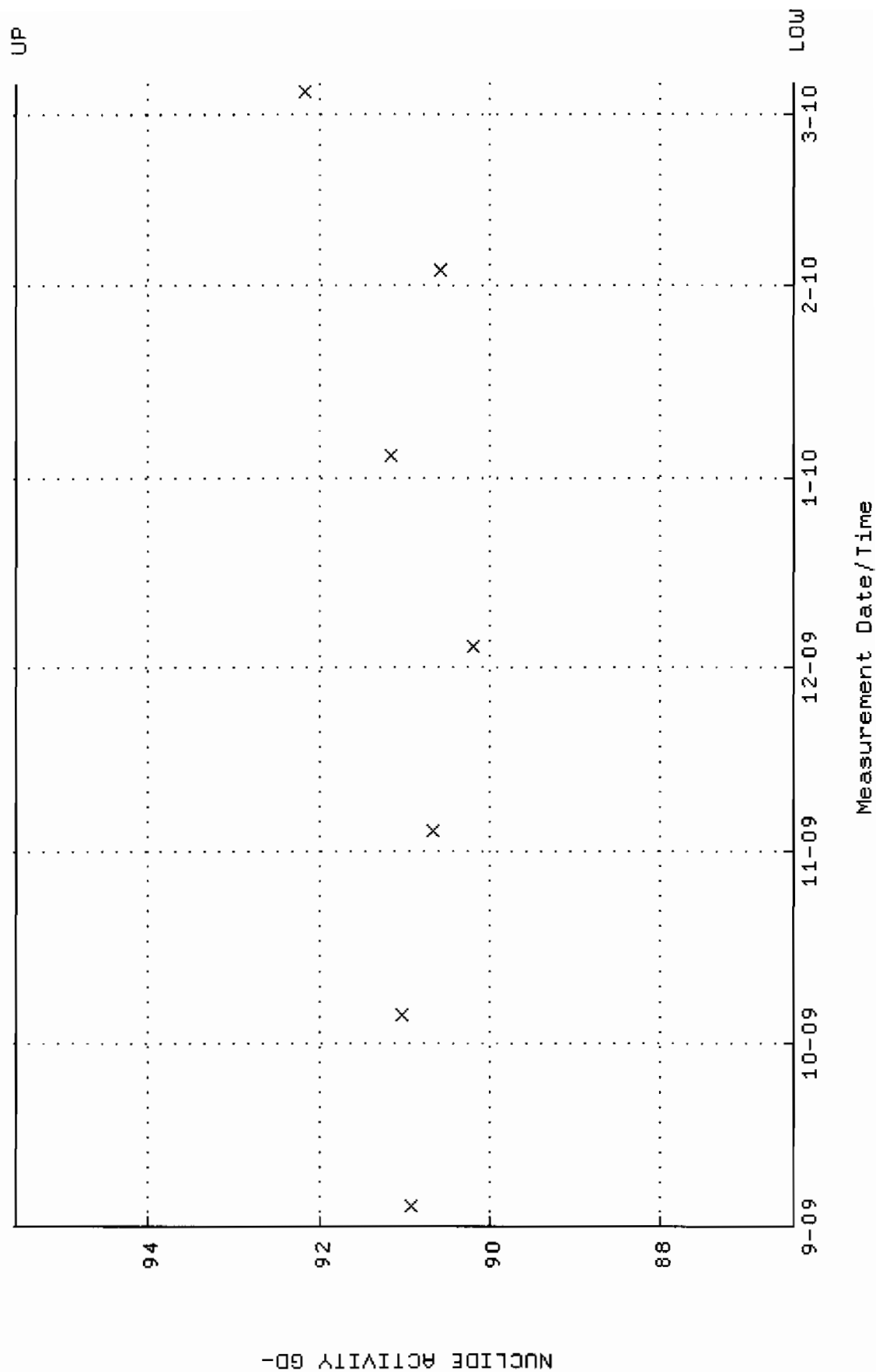
# BACKGROUND AND EFFICIENCY DATA



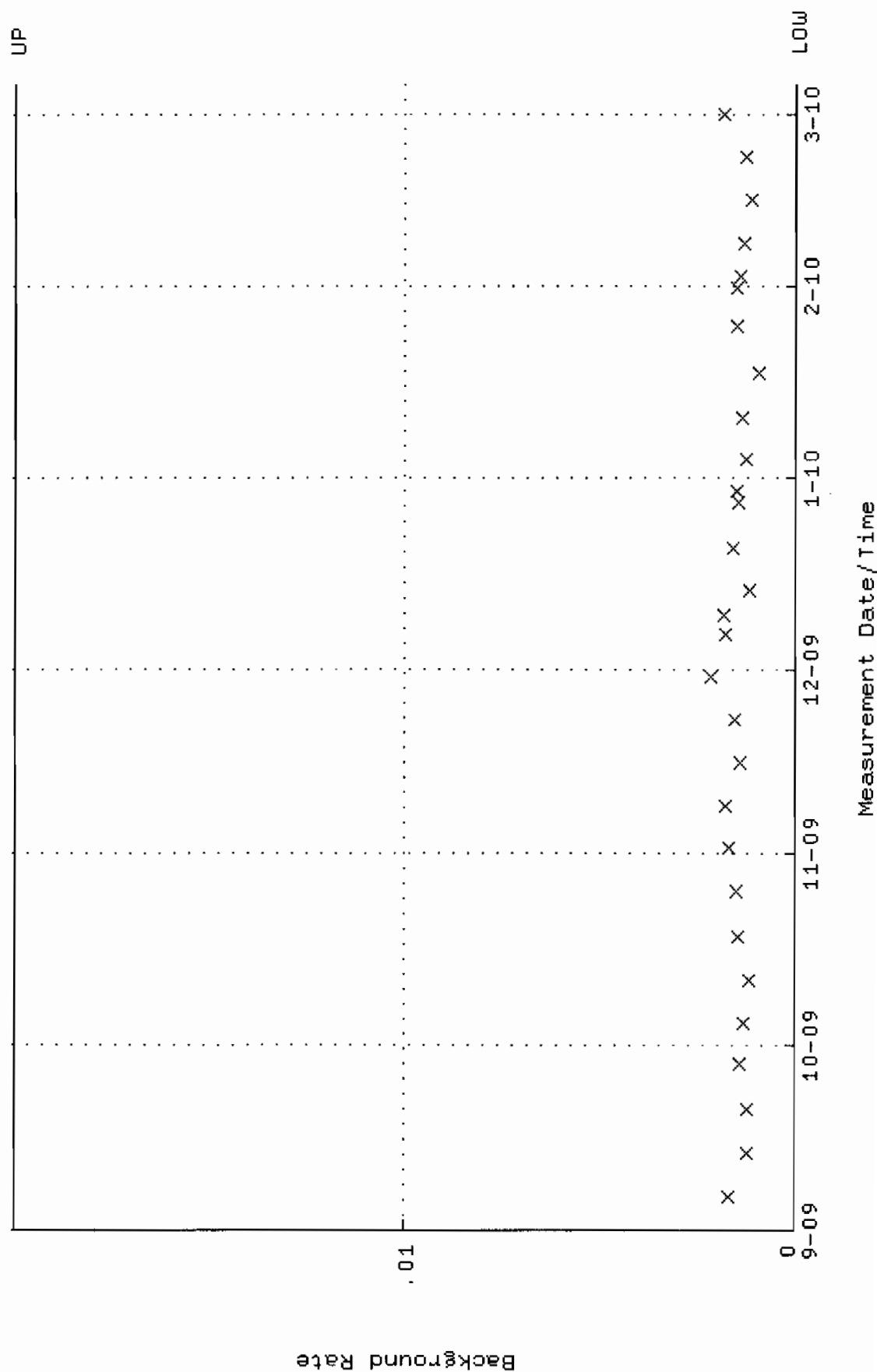
QA filename : DKA100:[ENV\_ALPHA.QA.W]W009.QAF;3  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 4-SEP-2009 07:36:40 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.328261 through 0.348261



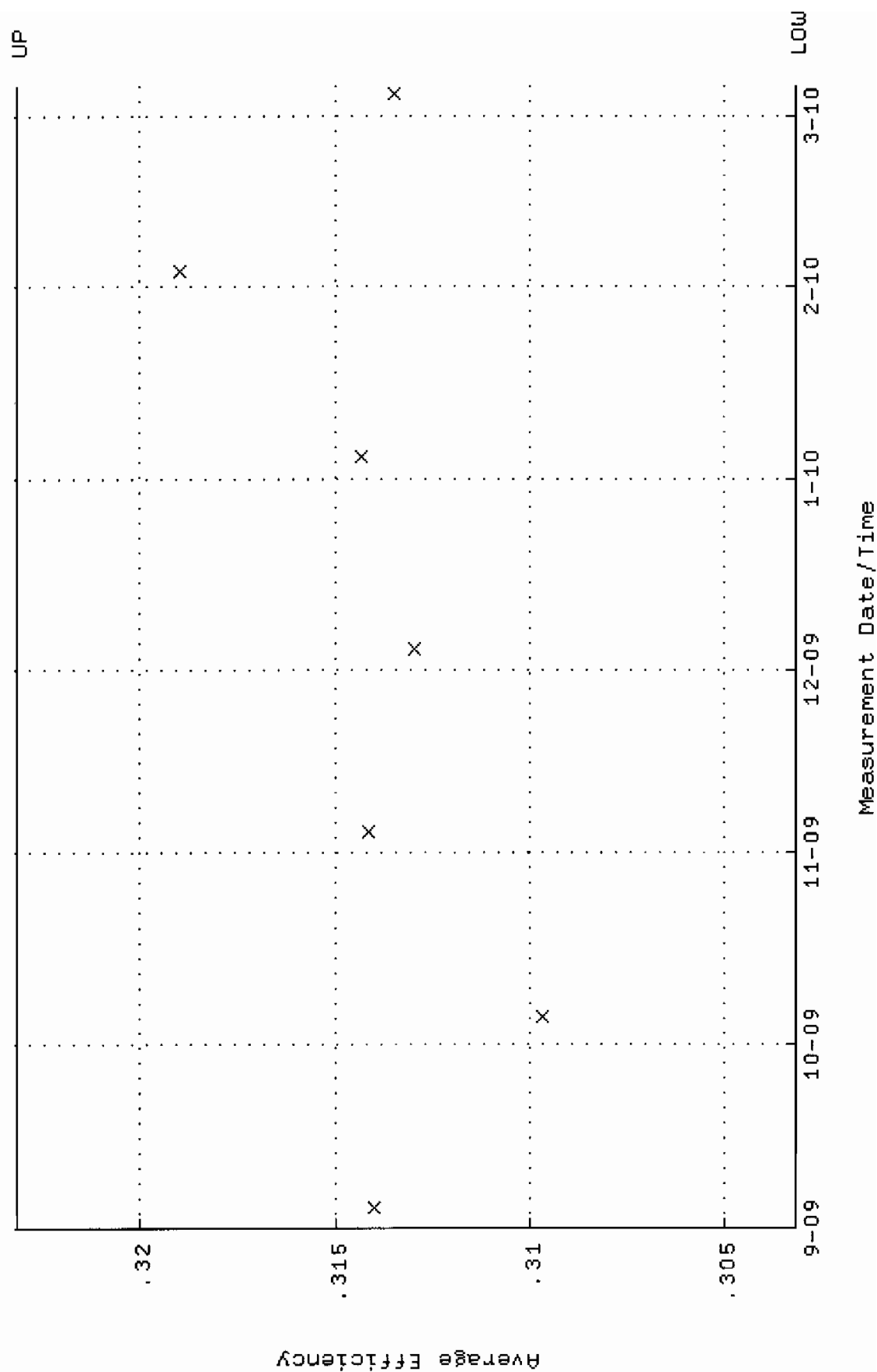
QA filename : DKA100:[ENV\_ALPHA.QA.W]W009.QAF;3  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 4-SEP-2009 07:36:40 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 86.4475 through 95.5473



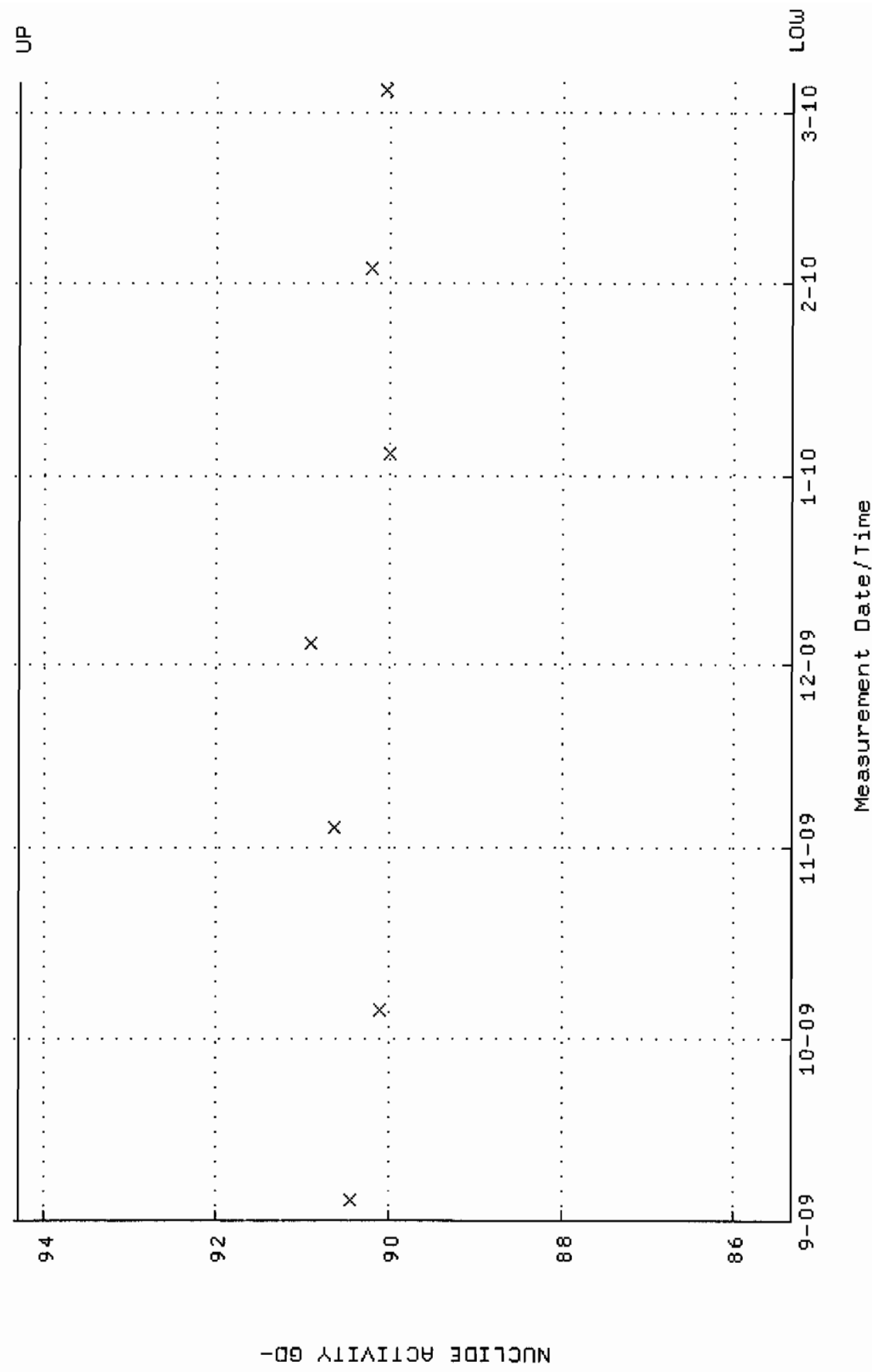
QA filename : DKA100:[ENV\_ALPHA.QA.B]B009.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 14:27:01 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



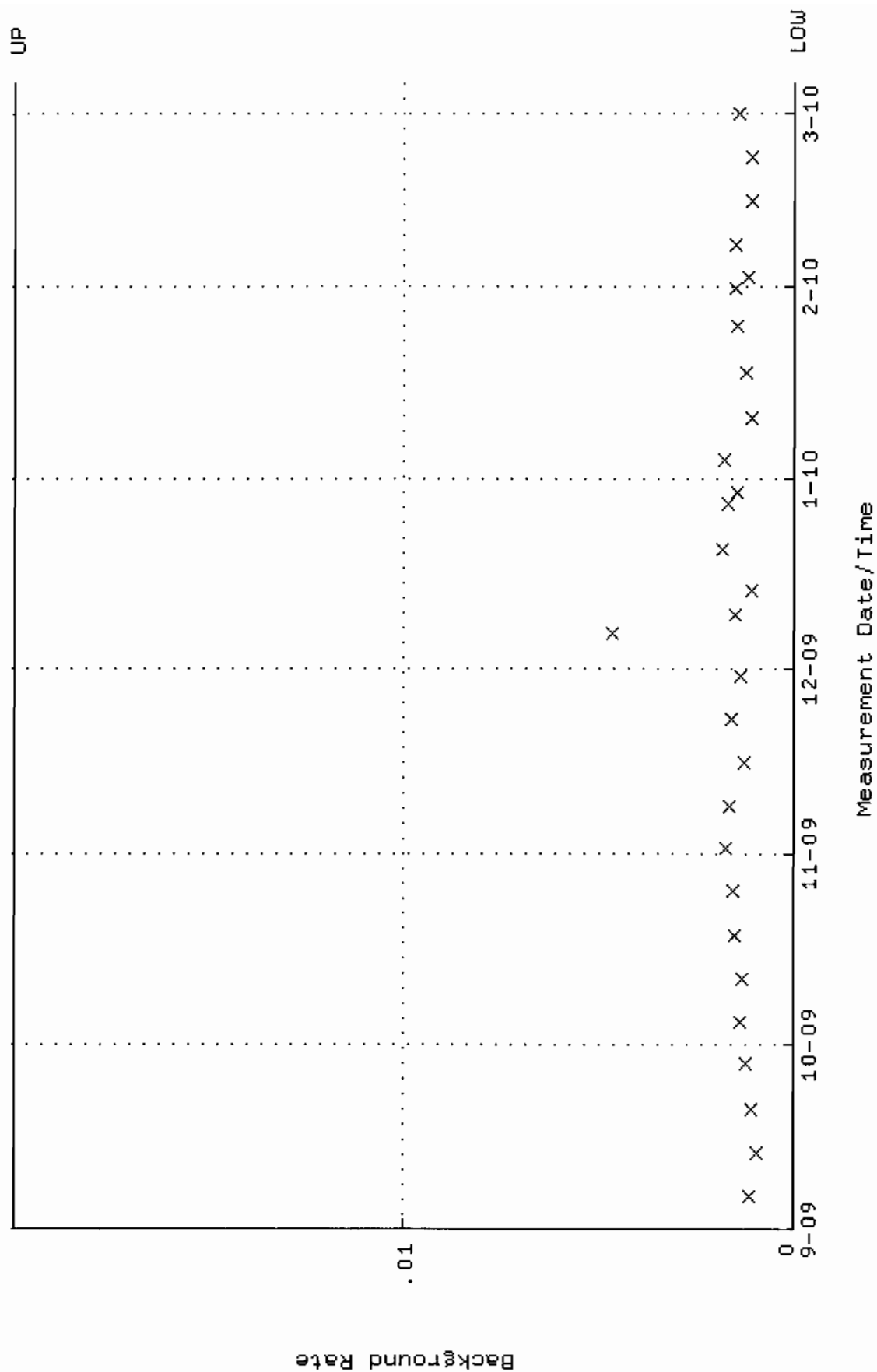
QA filename : DKA100:[ENV-ALPHA.QA.W]W010.QAF;5  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 4-SEP-2009 07:36:40 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.303169 through 0.323169



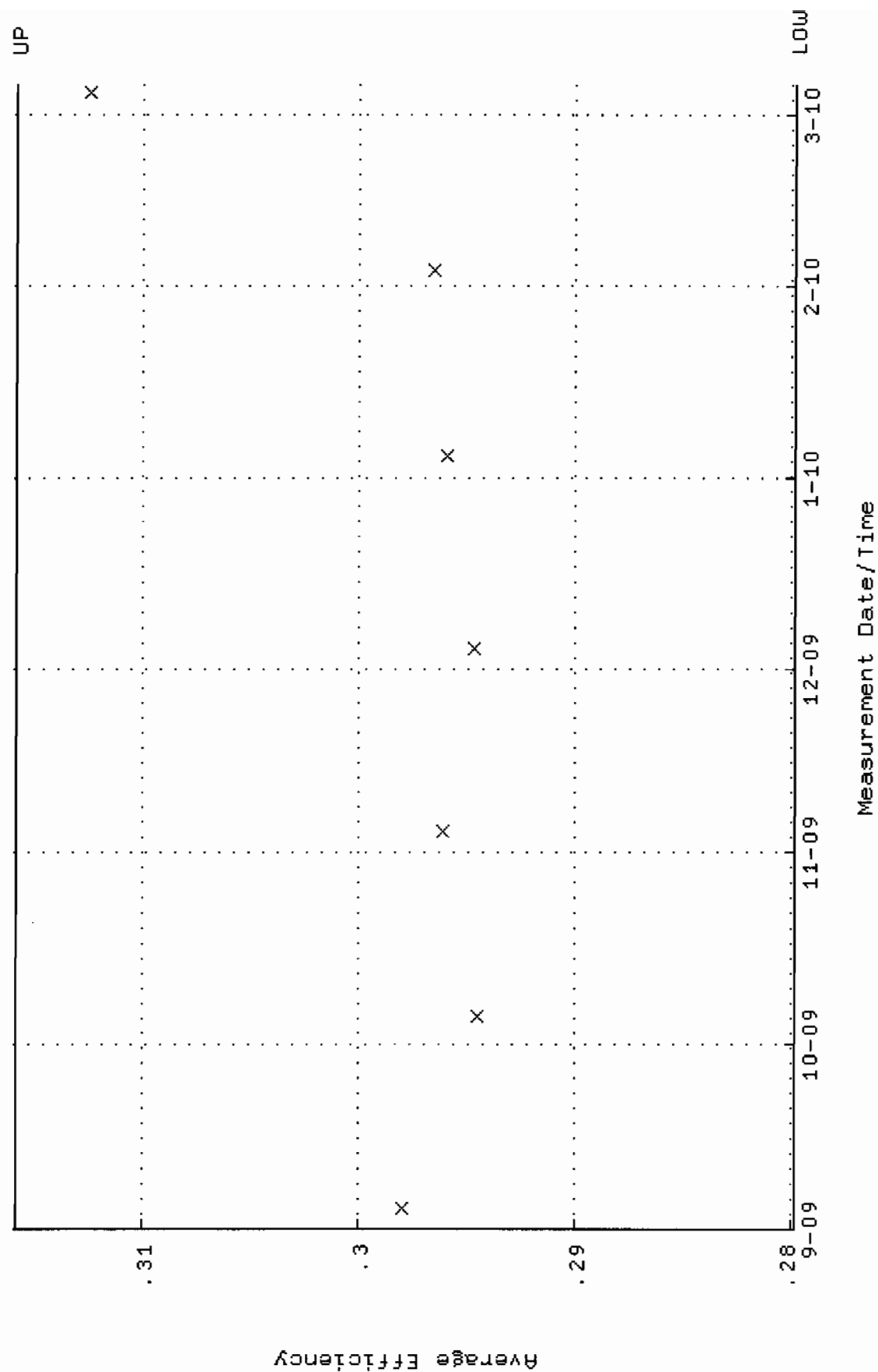
QA filename : DKA100:[ENV\_ALPHA.QA.W]W010.QAF;5  
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
Start/End Dates : 4-SEP-2009 07:36:40 through 5-MAR-2010 12:00:00  
Lower/Upper Lmts: 85.3273 through 94.3091



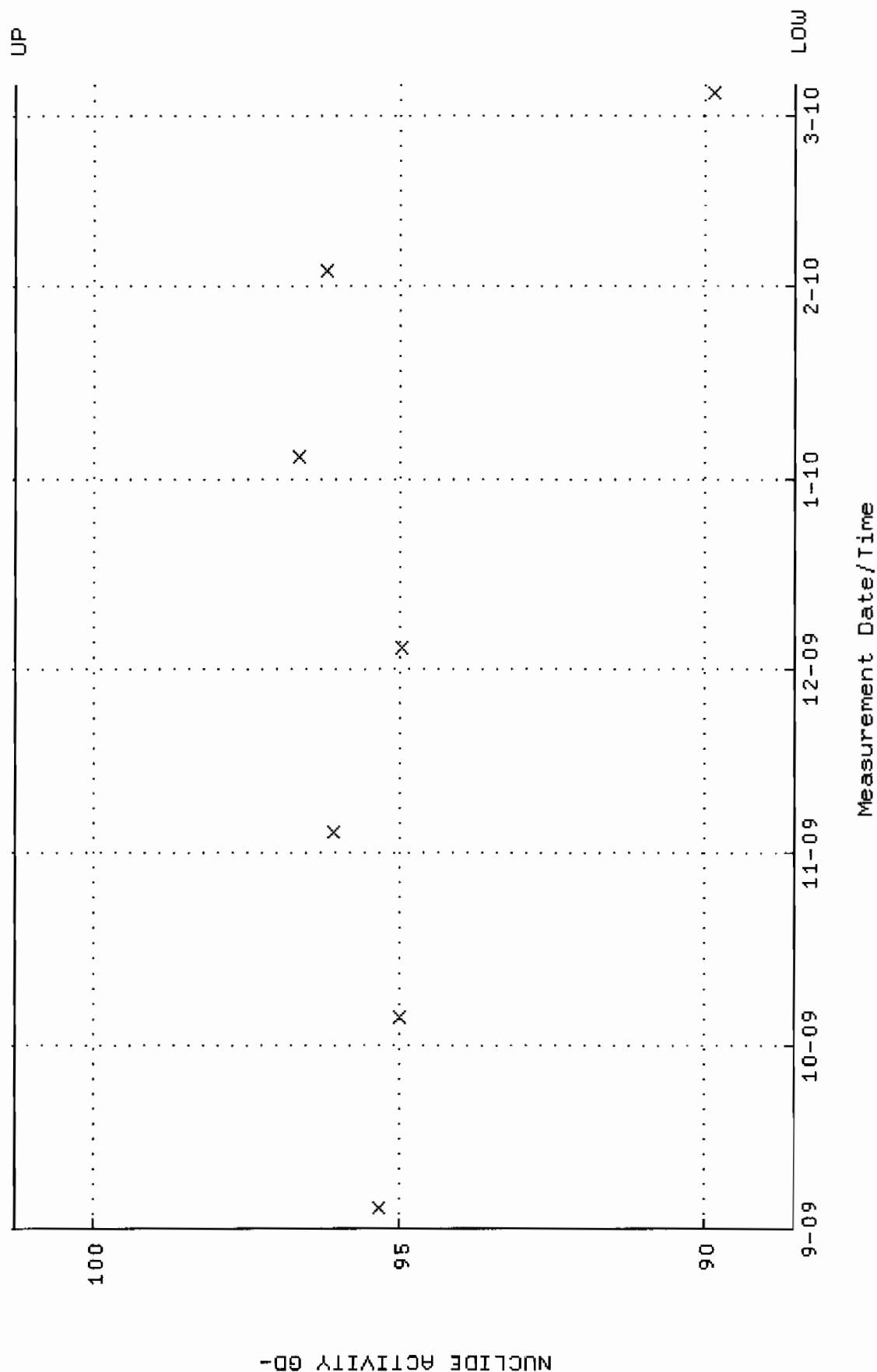
QA filename : DKA100:[ENV\_ALPHA.QA.B]B010.QAF;2  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 14:27:01 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



QA filename : DKA100:[ENV\_ALPHA.QA.W]W011.QAF;4  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 4-SEP-2009 07:36:40 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.279805 through 0.315875

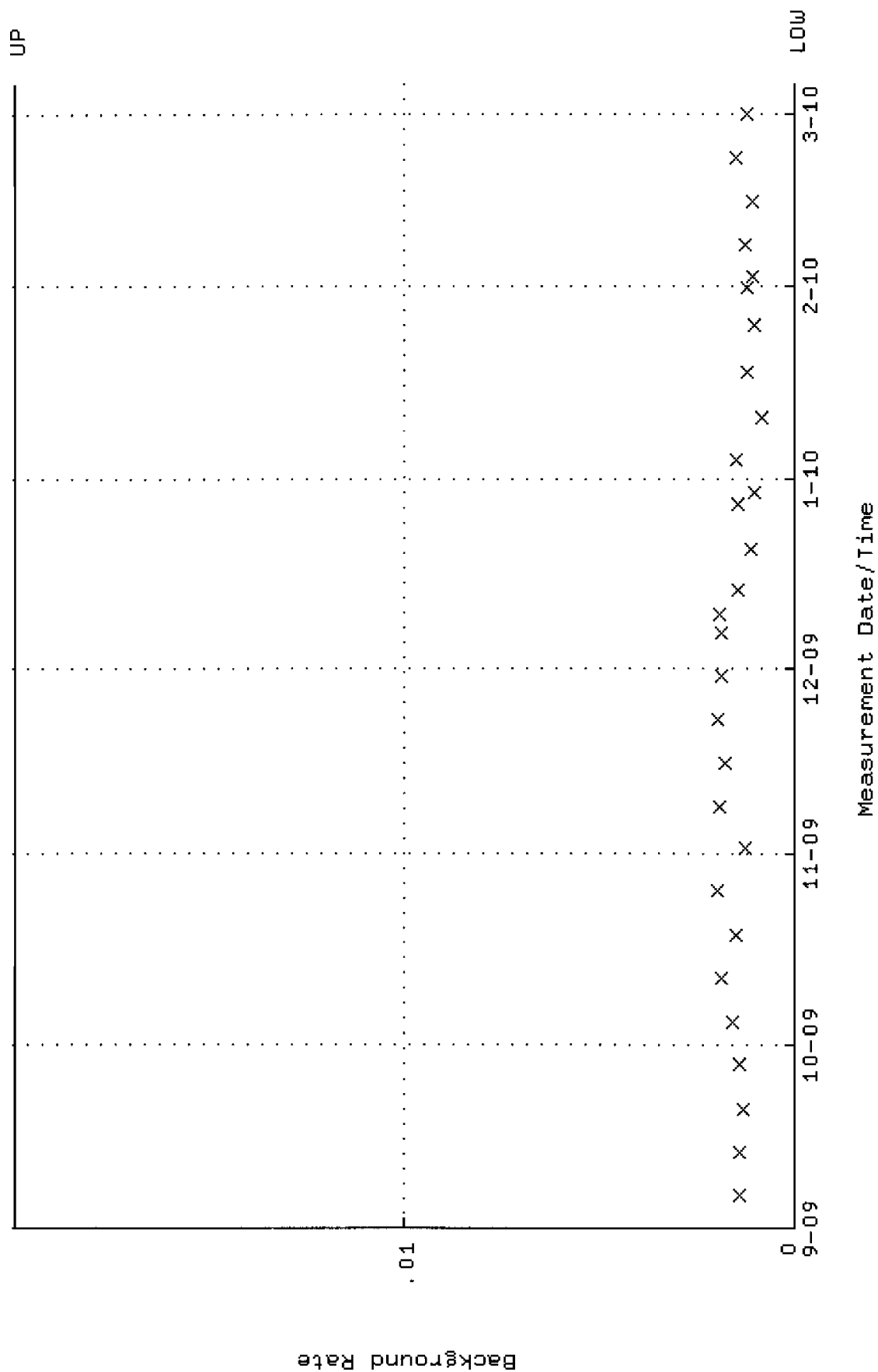


QA filename : OKA100:[ENV\_ALPHA.QA.W]W011.QAF;4  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 4-SEP-2009 07:36:40 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 88.5390 through 101.289

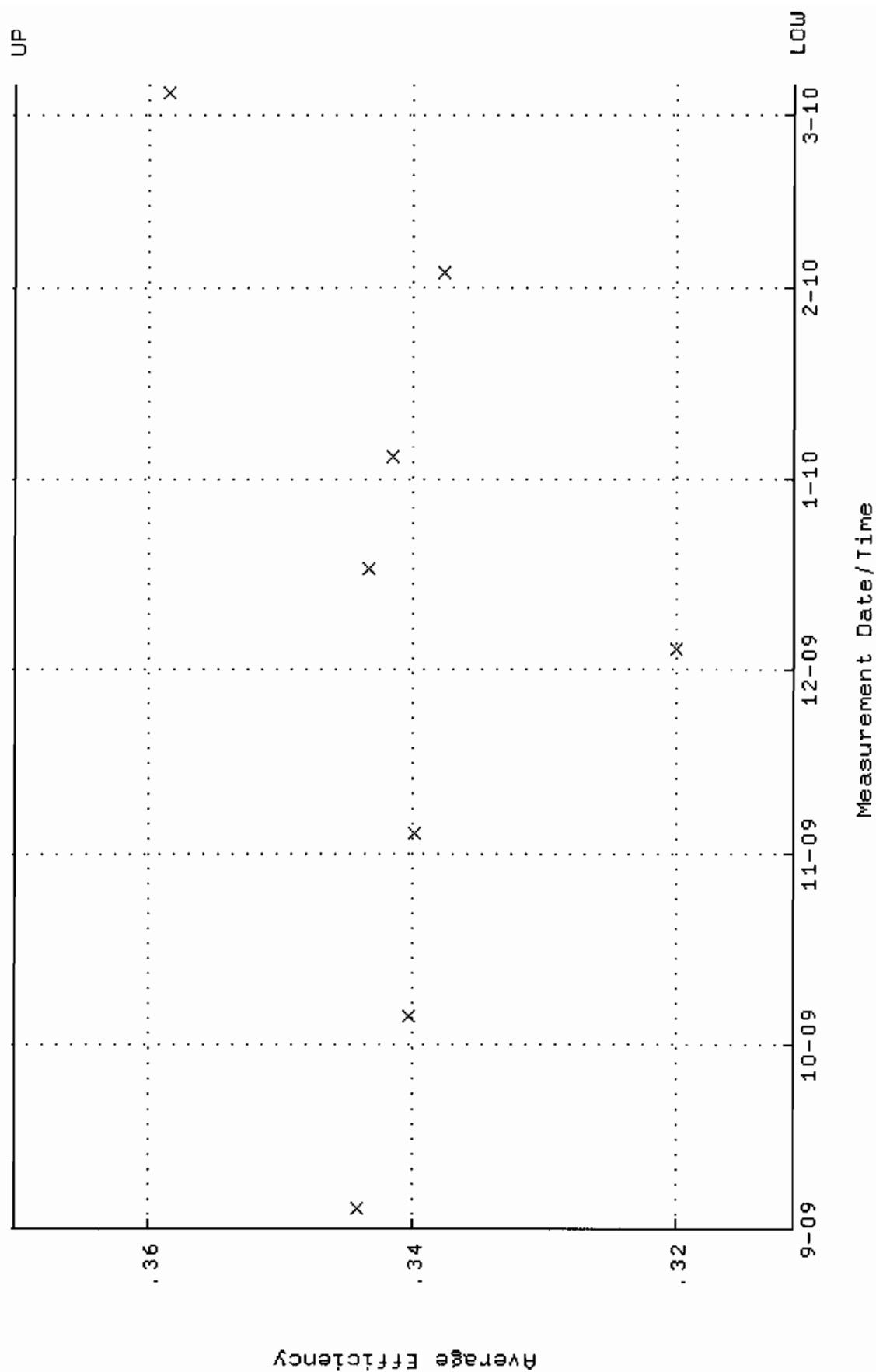




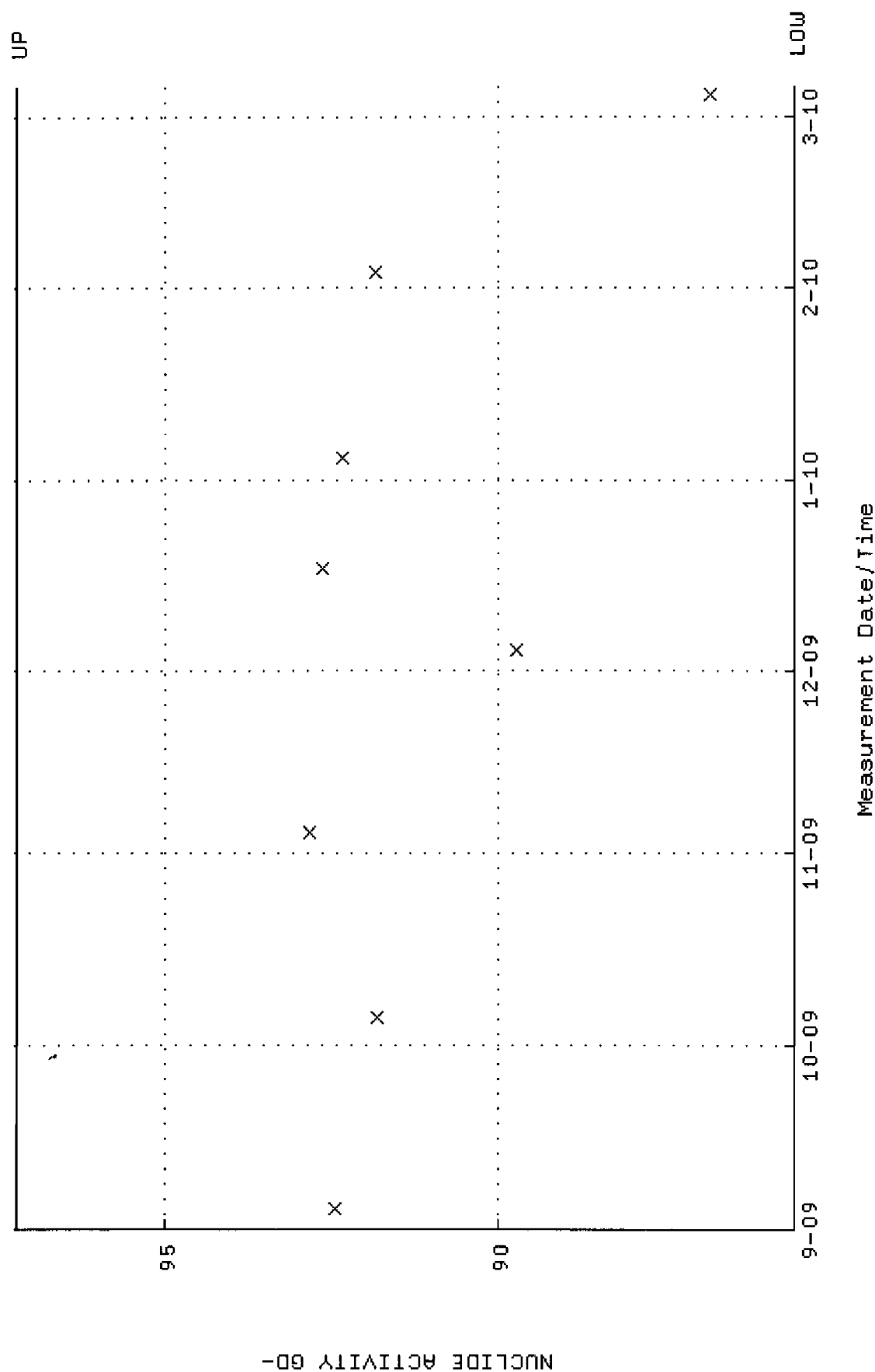
QA filename : DKA100:[ENV\_ALPHA.QA.B]B011.QAF;2  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 14:27:01 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



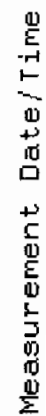
QA filename : DKA100:[ENV\_ALPHA.QA.W]W013.QAF;2  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.311179 through 0.370113



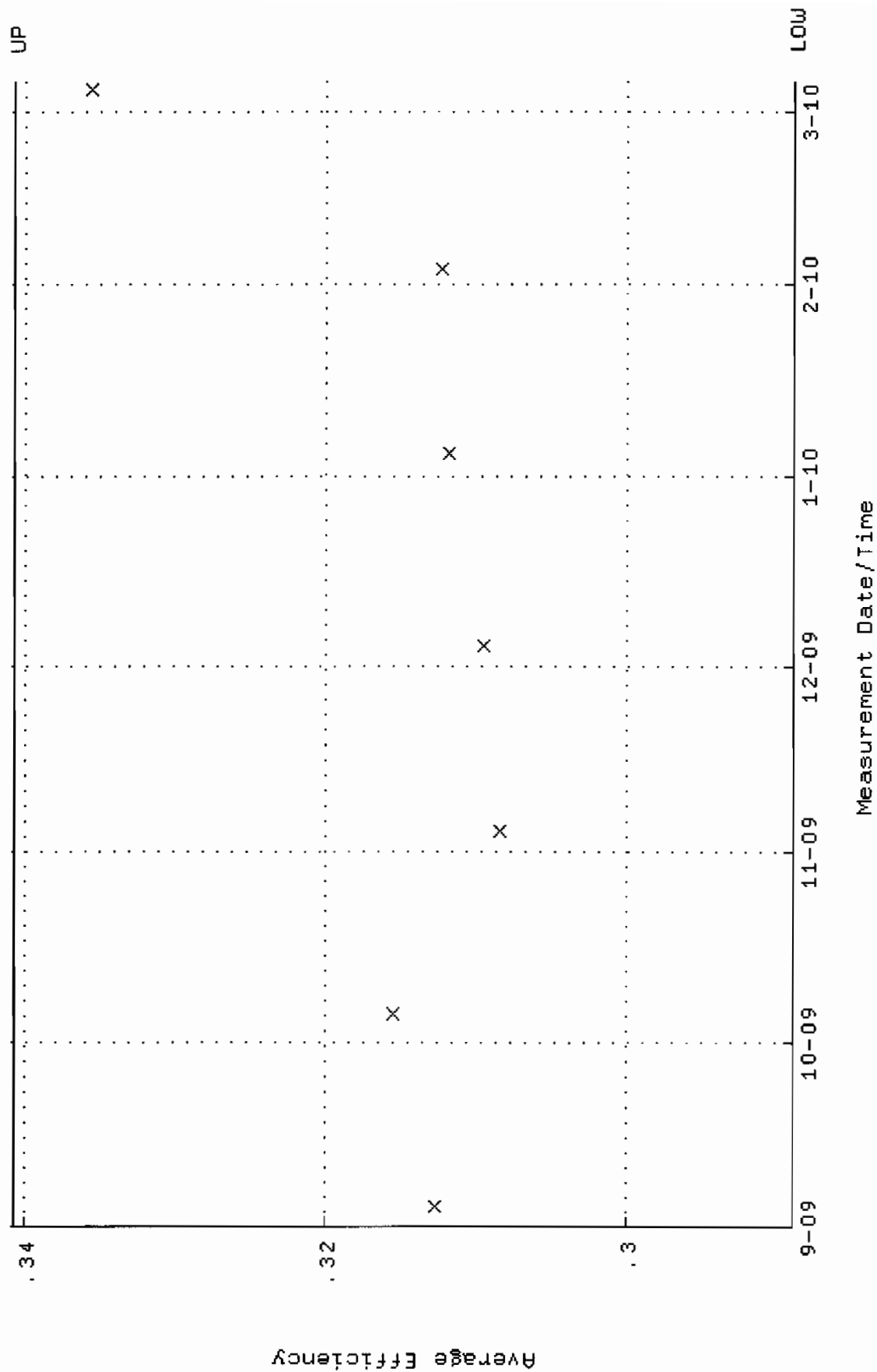
QA filename : DKA100:[ENV\_ALPHA.QA.W]W013.QAF;2  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 85.5651 through 97.2315



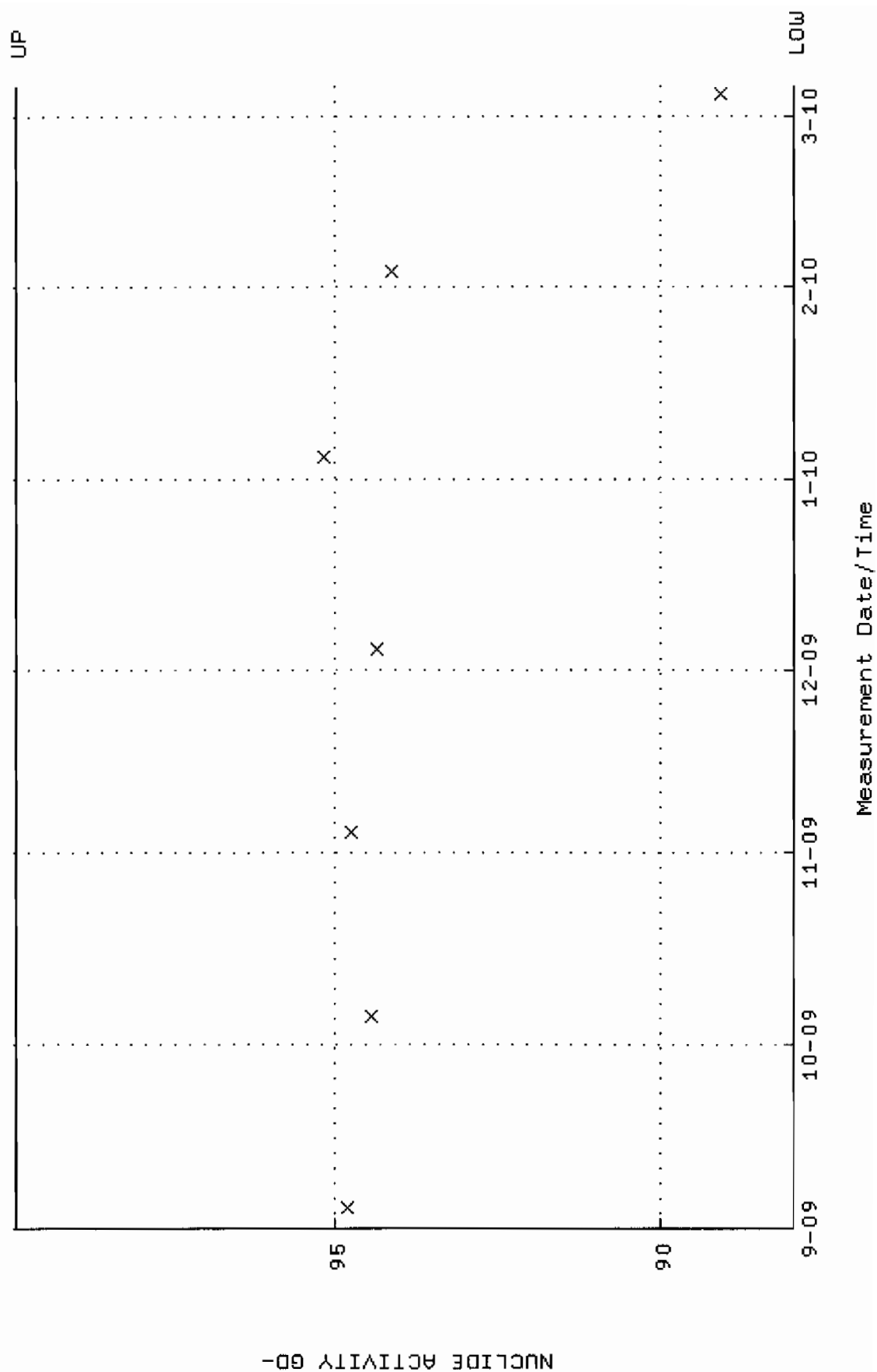
Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



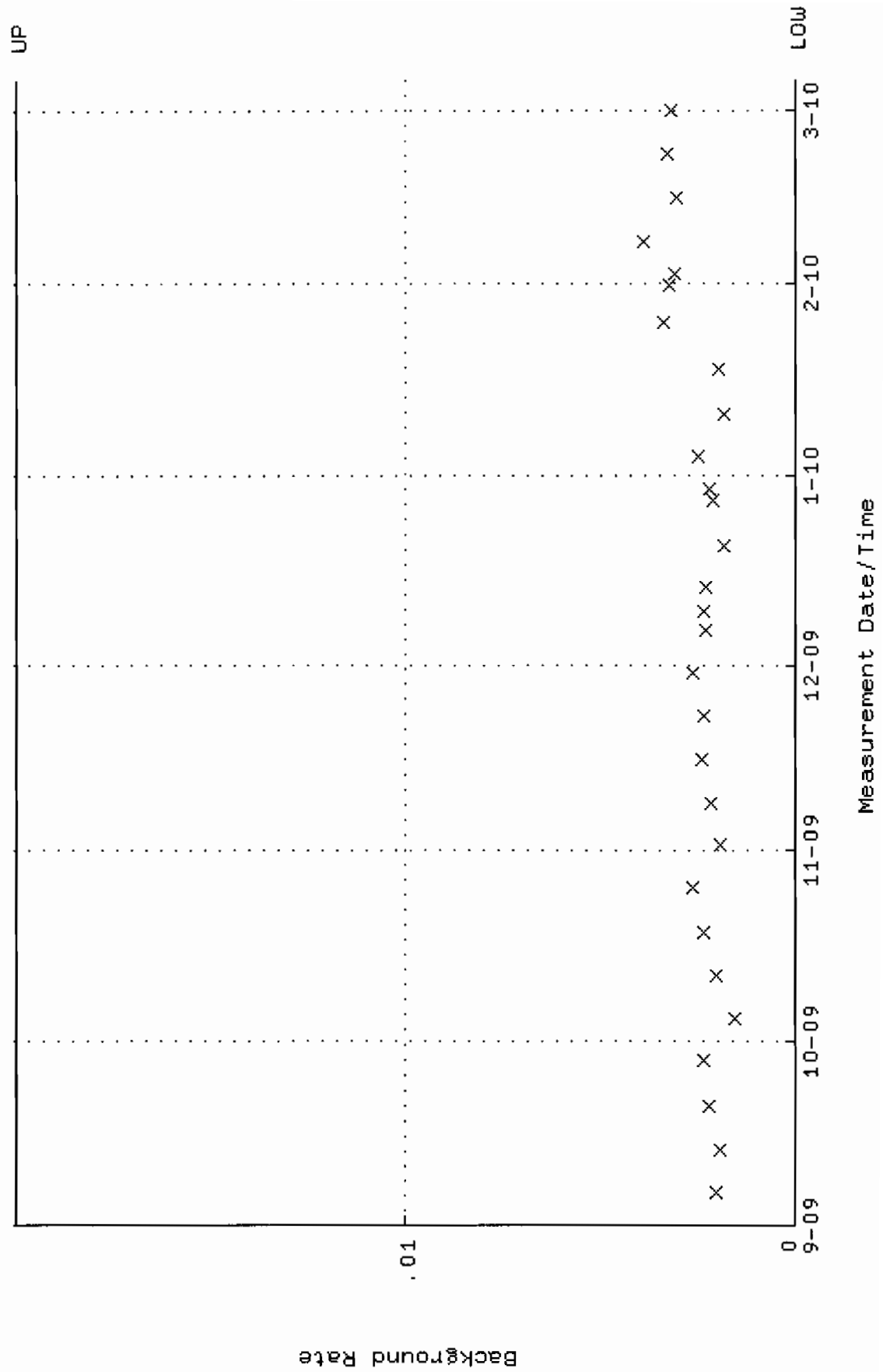
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 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.288973 through 0.340739



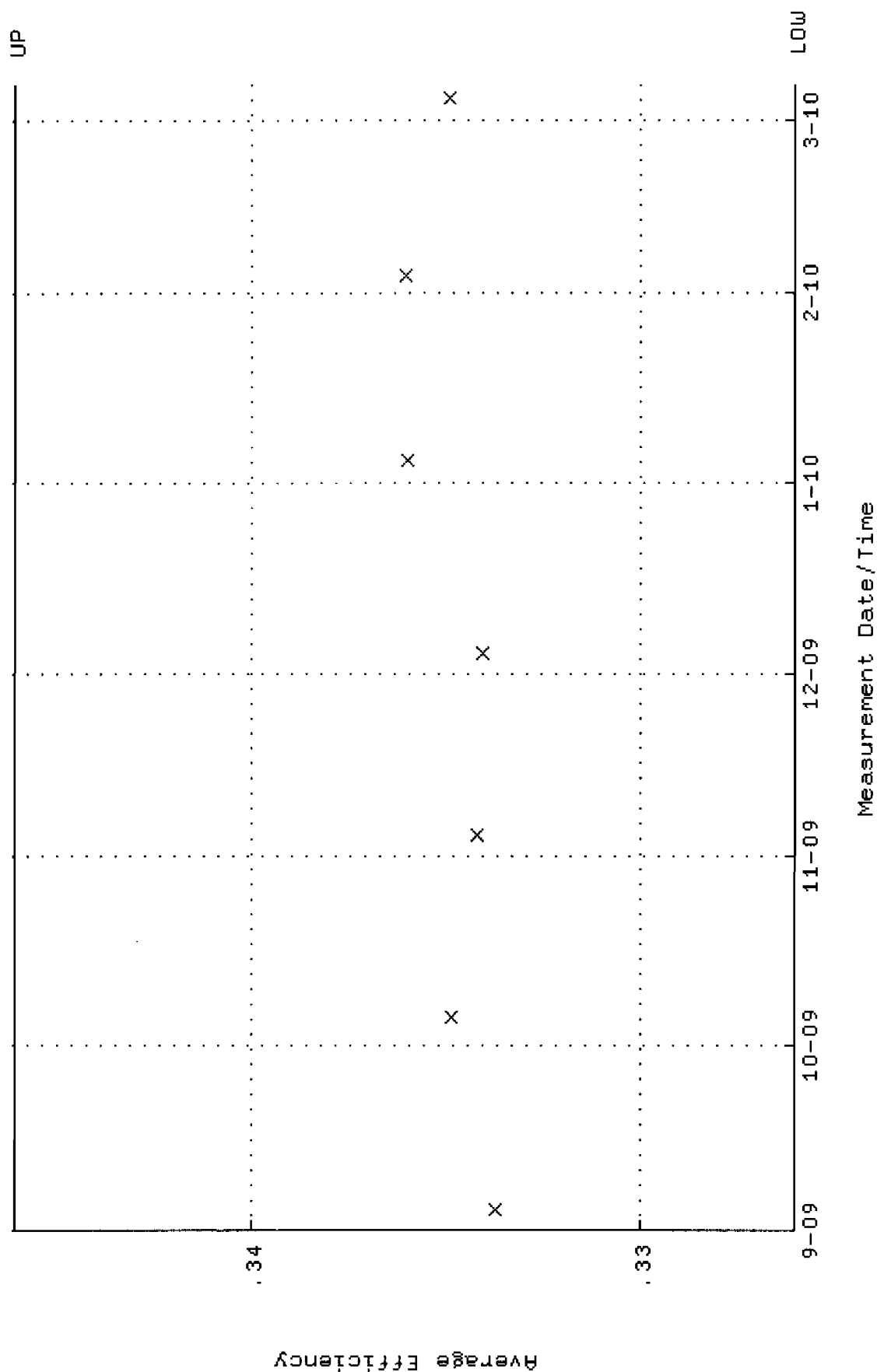
QA filename : DKA100:[ENV\_ALPHA.QA.W]W014.QAF;4  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 87.9529 through 99.8771



QA filename : DKA100:[ENV\_ALPHA.QA.B]B014.QAF;2  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 14:27:02 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02

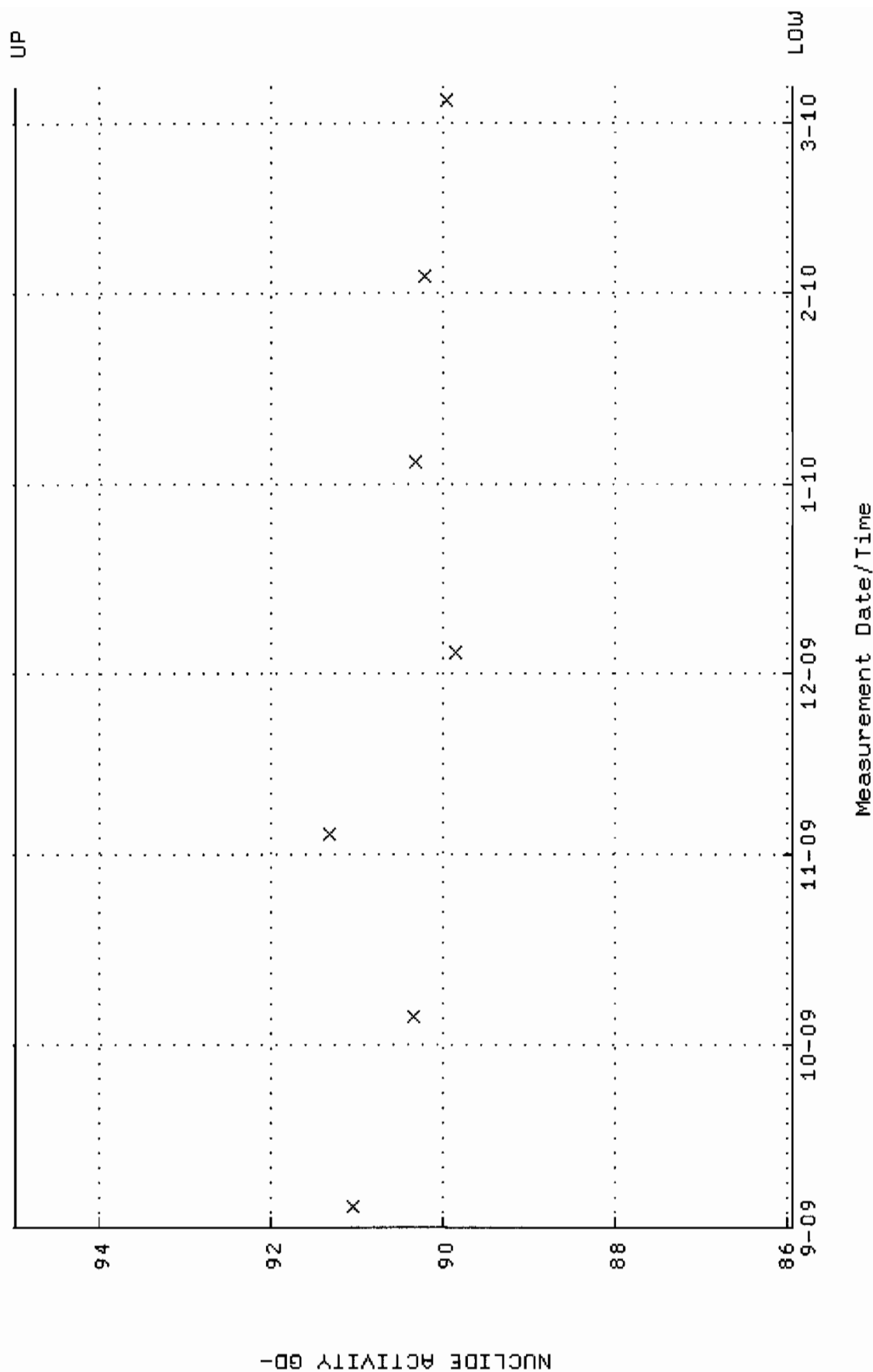


QA filename : OKA100:[ENV\_ALPHA.QA.W]W016.QAF;3  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 6-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.326058 through 0.346058

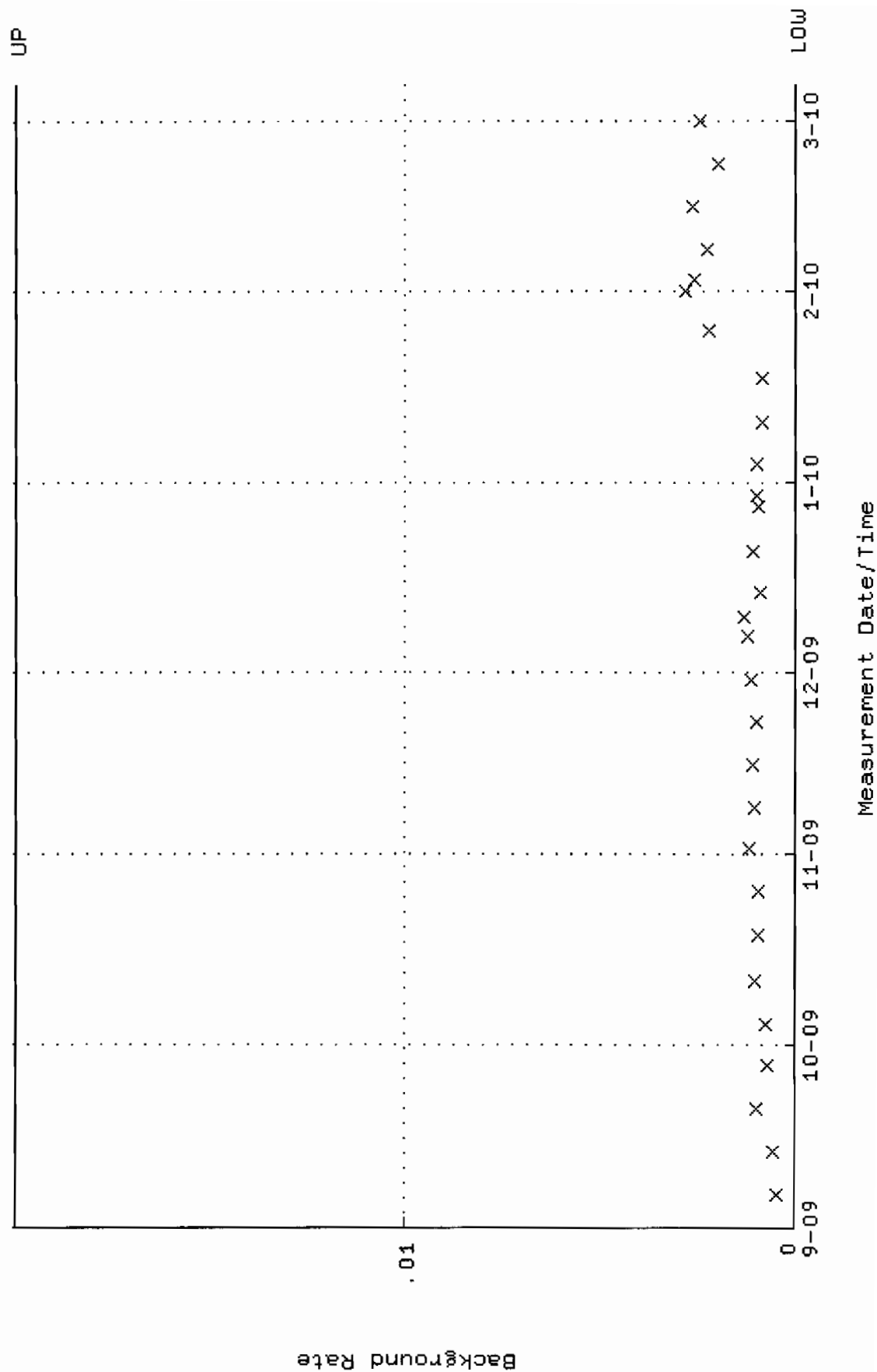




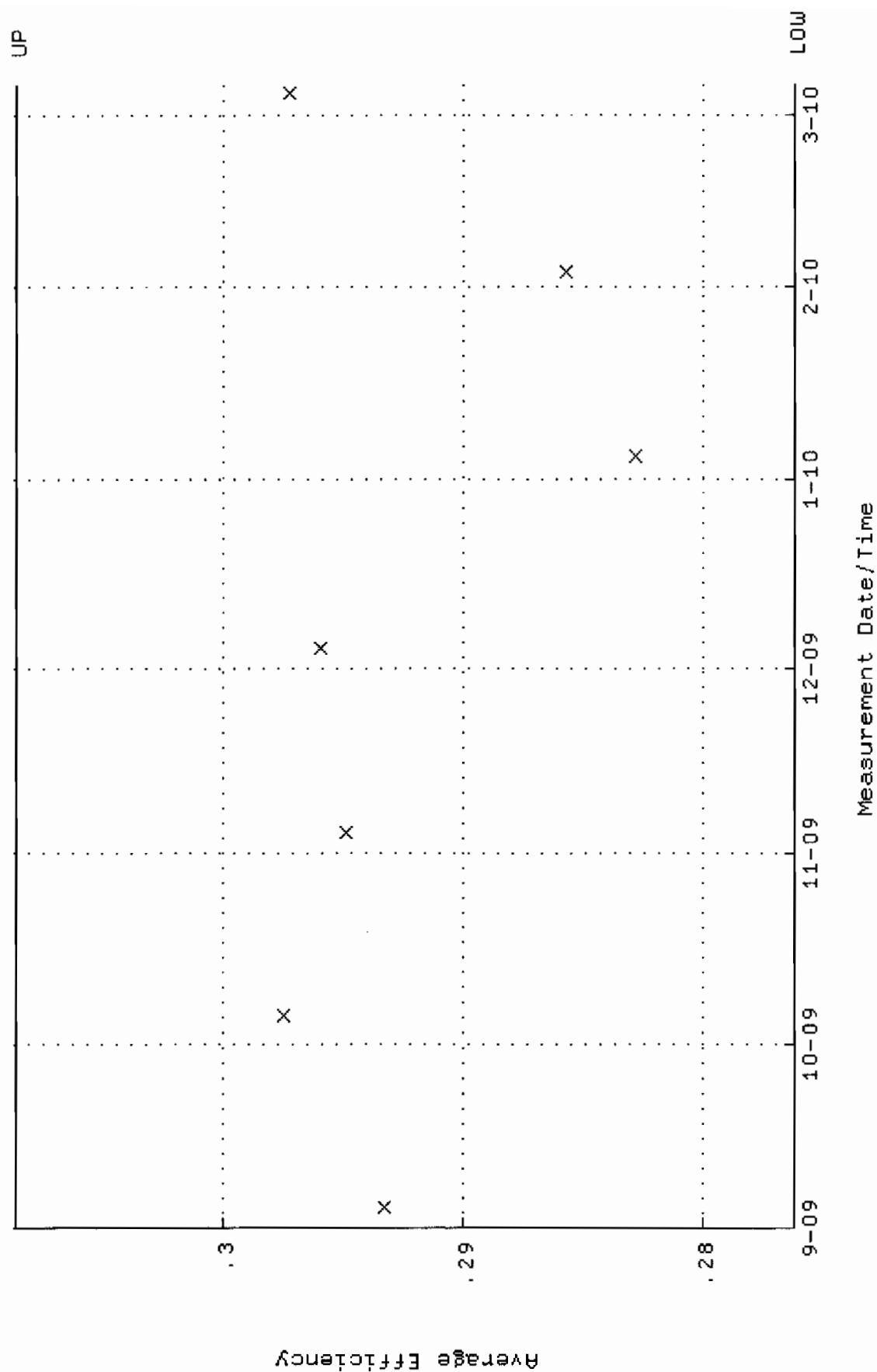
QA filename : DKA100:[ENV\_ALPHA.QA.W]W016.QAF;3  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 6-MAR-2010 12:00:00  
 Lower/Upper Lmts: 85.9280 through 94.9730



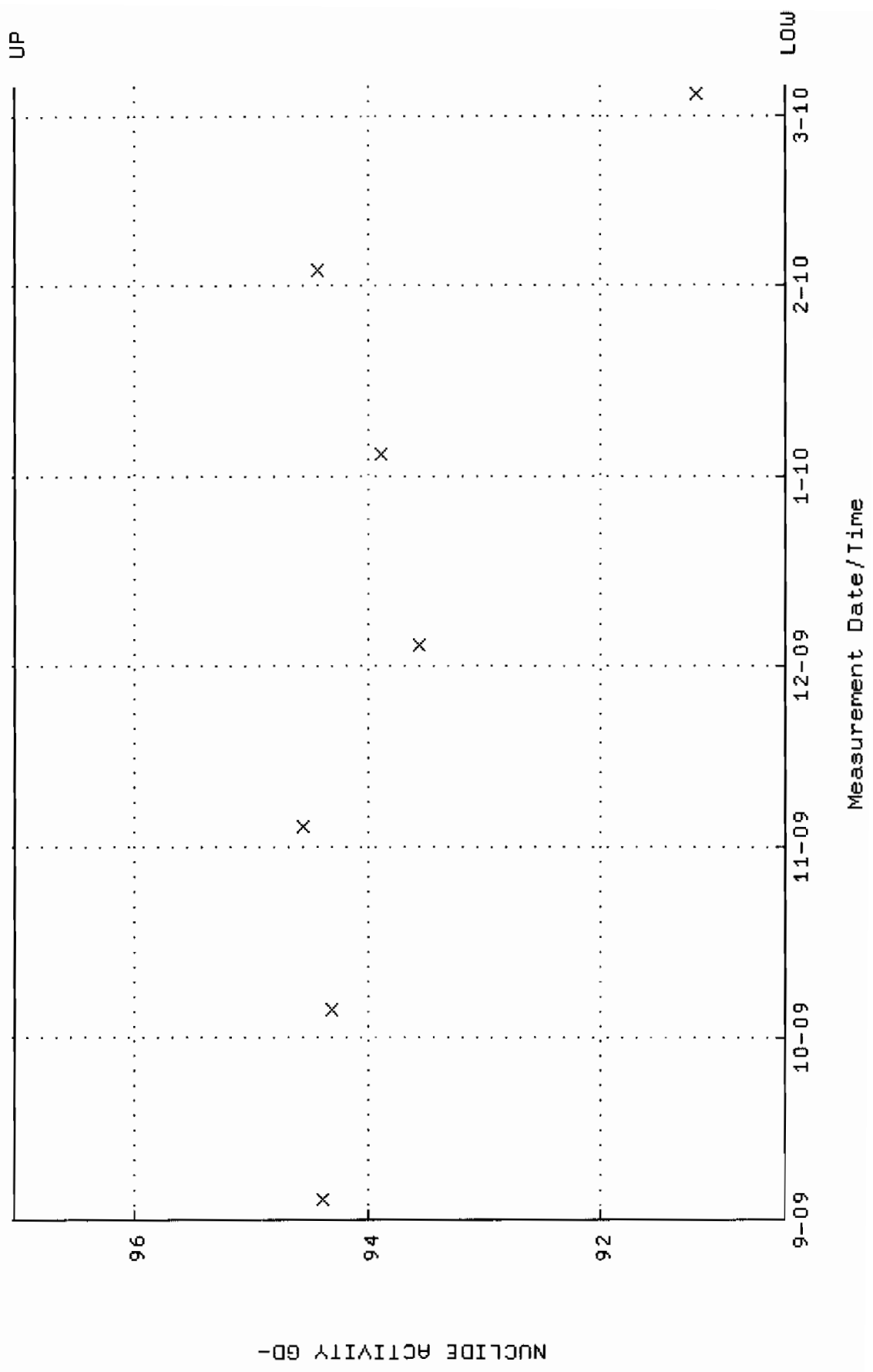
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 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



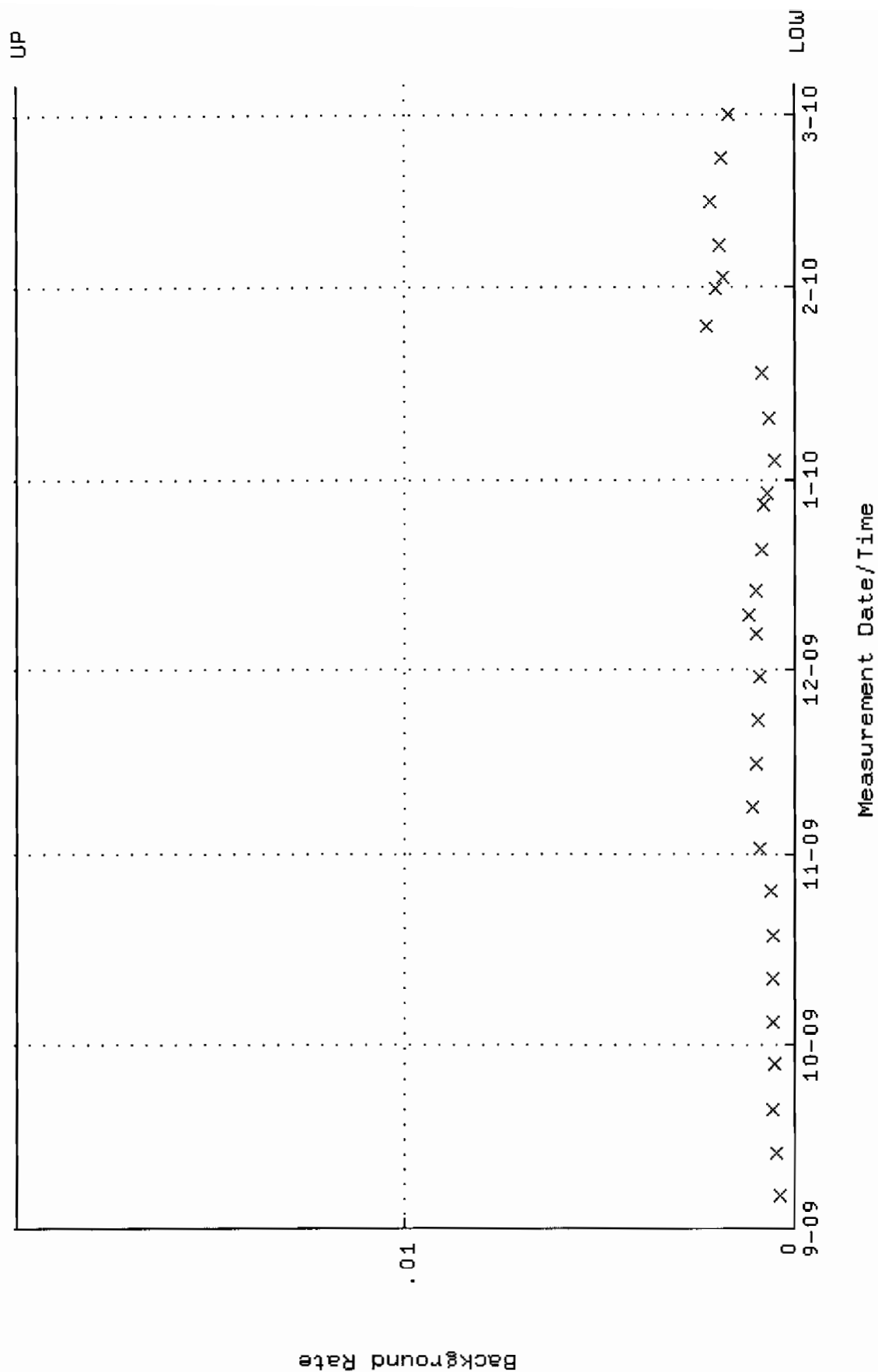
QA filename : DKA100:[ENV\_ALPHA.QA.W]W017.QAF;4  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.276155 through 0.308631



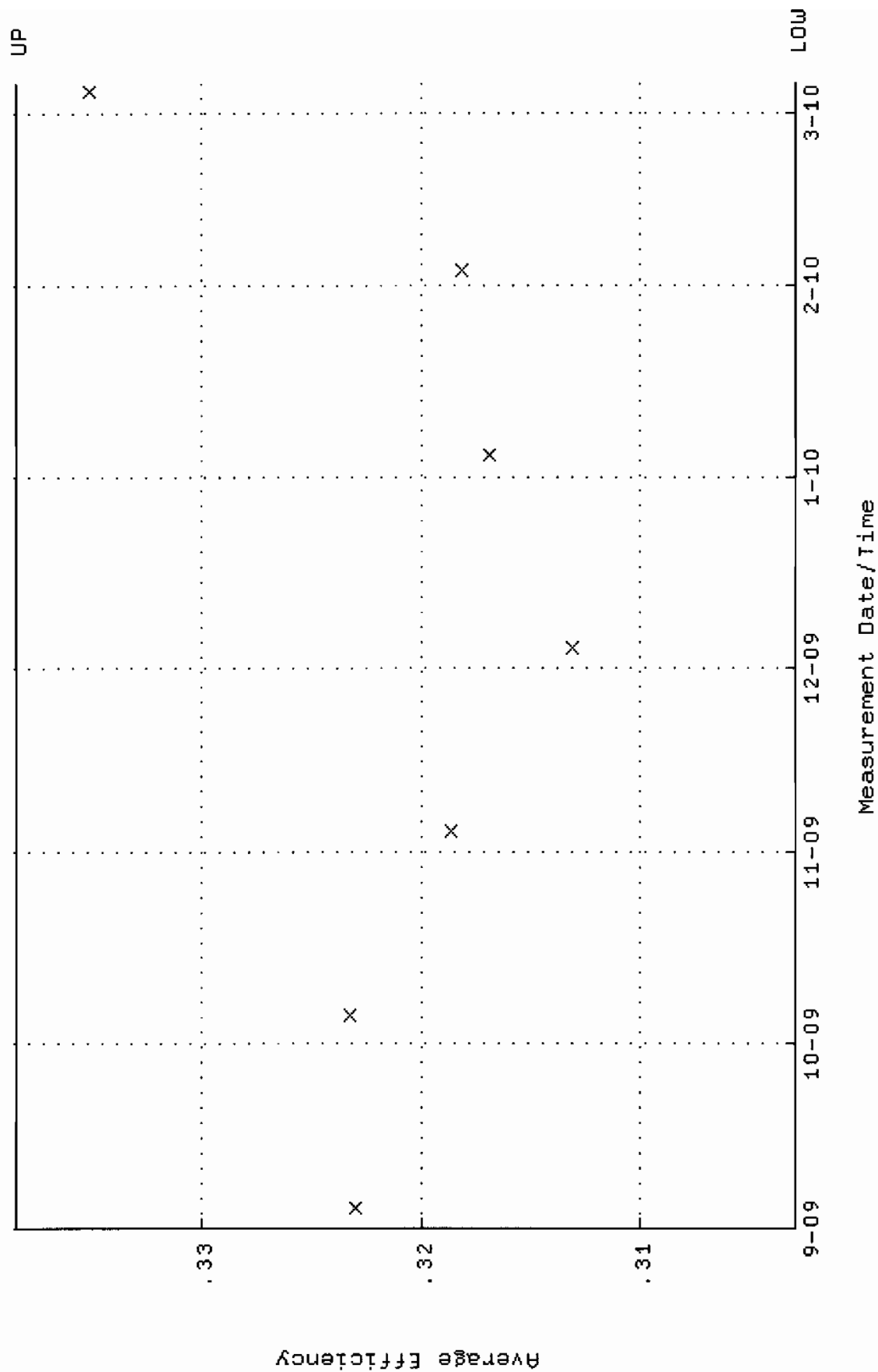
QA filename : DKA100:[ENV\_ALPHA.QA.W]W017.QAF;4  
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
Start/End Dates : 4-SEP-2009 07:36:41 through 5-MAR-2010 12:00:00  
Lower/Upper Lmts: 90.4251 through 97.0169



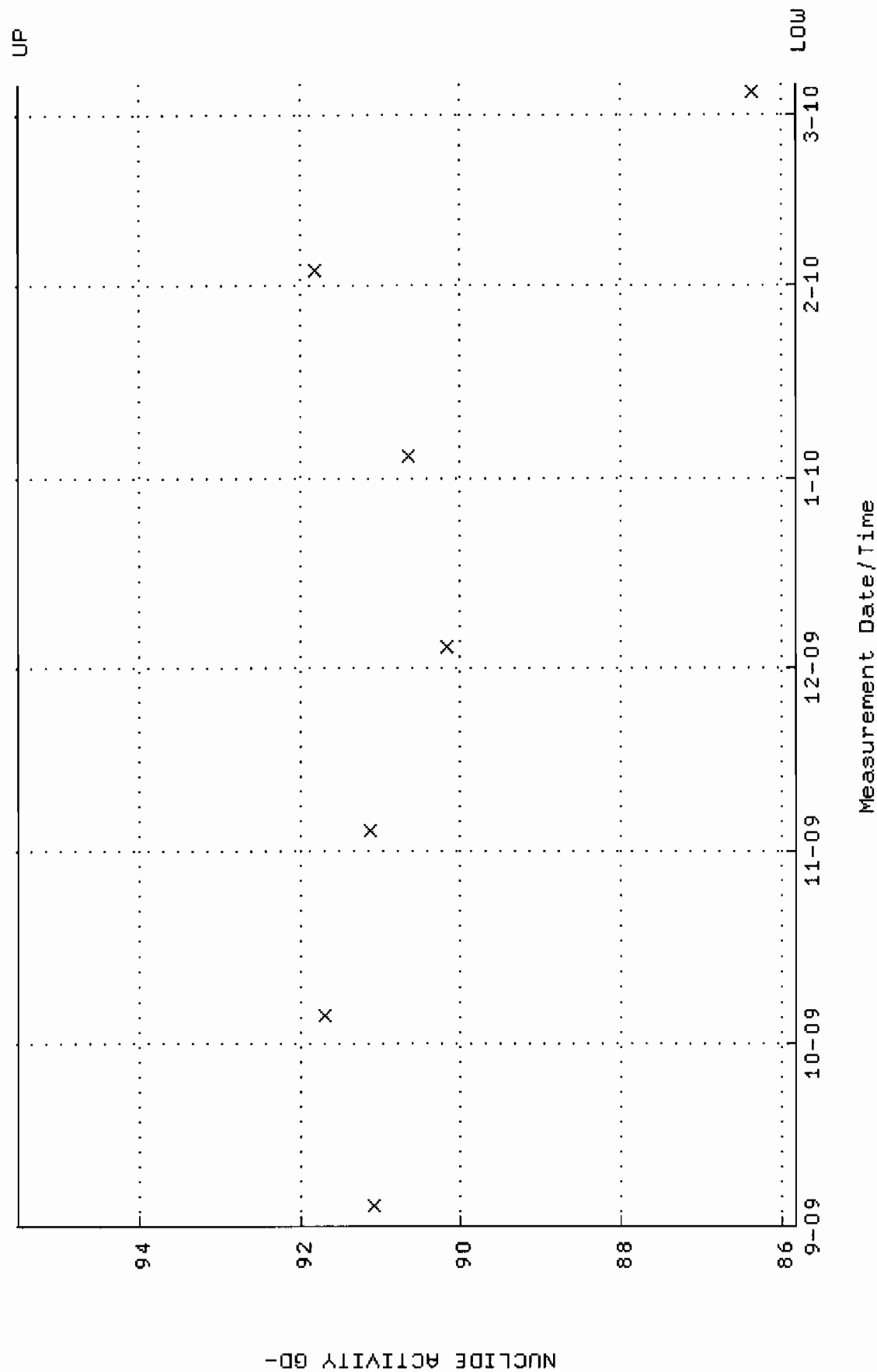
QA filename : DKA100:[ENV\_ALPHA.QA.B]B017.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 14:27:02 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



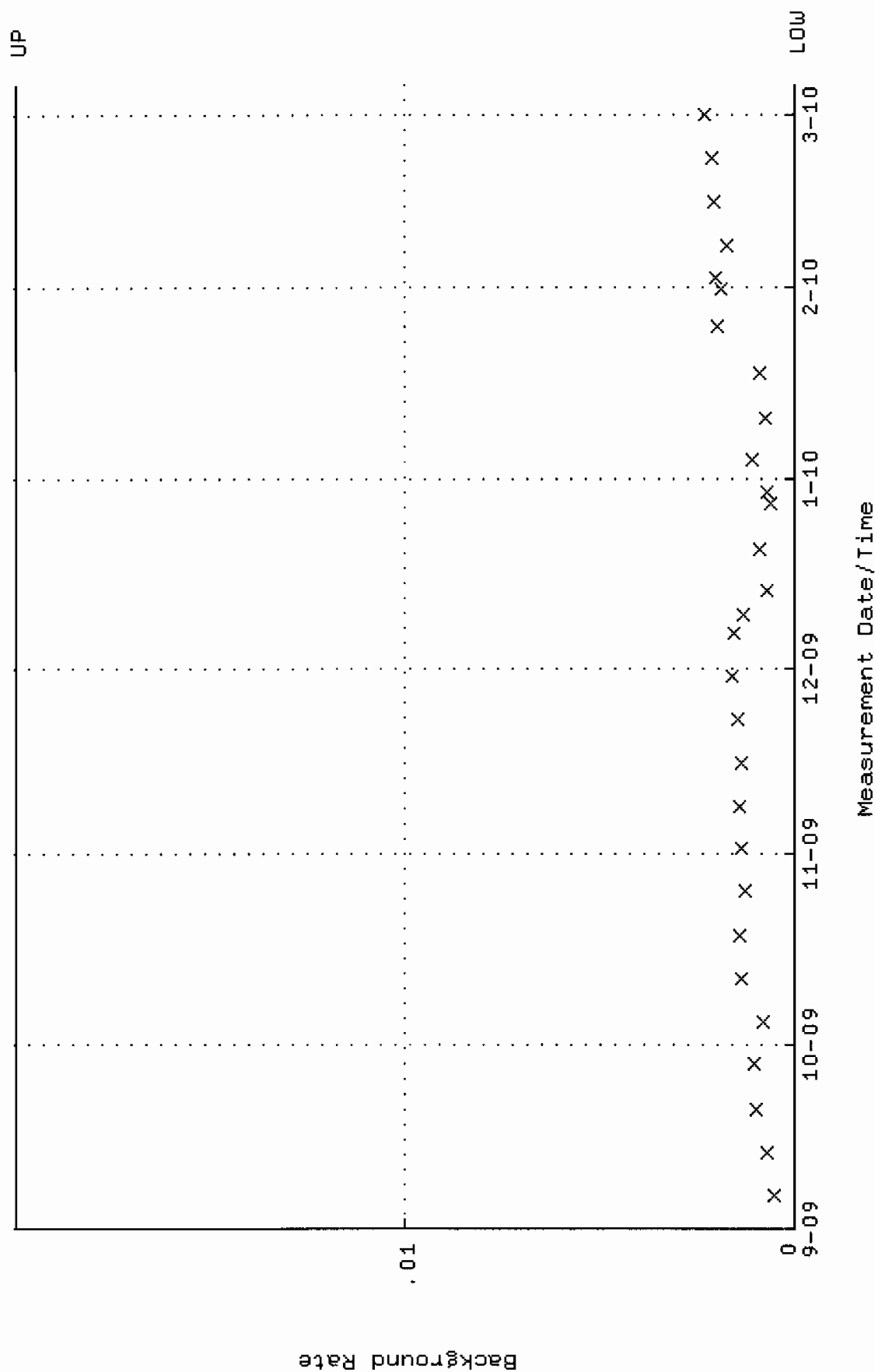
QA filename : DKA100:[ENV\_ALPHA.QA.W]W018.QAF;3  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.302900 through 0.338496



QA filename : DKA100:[ENV\_ALPHA.QA.W]W018.QAF;3  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 4-SEP-2009 07:36:41 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 85.8111 through 95.5079

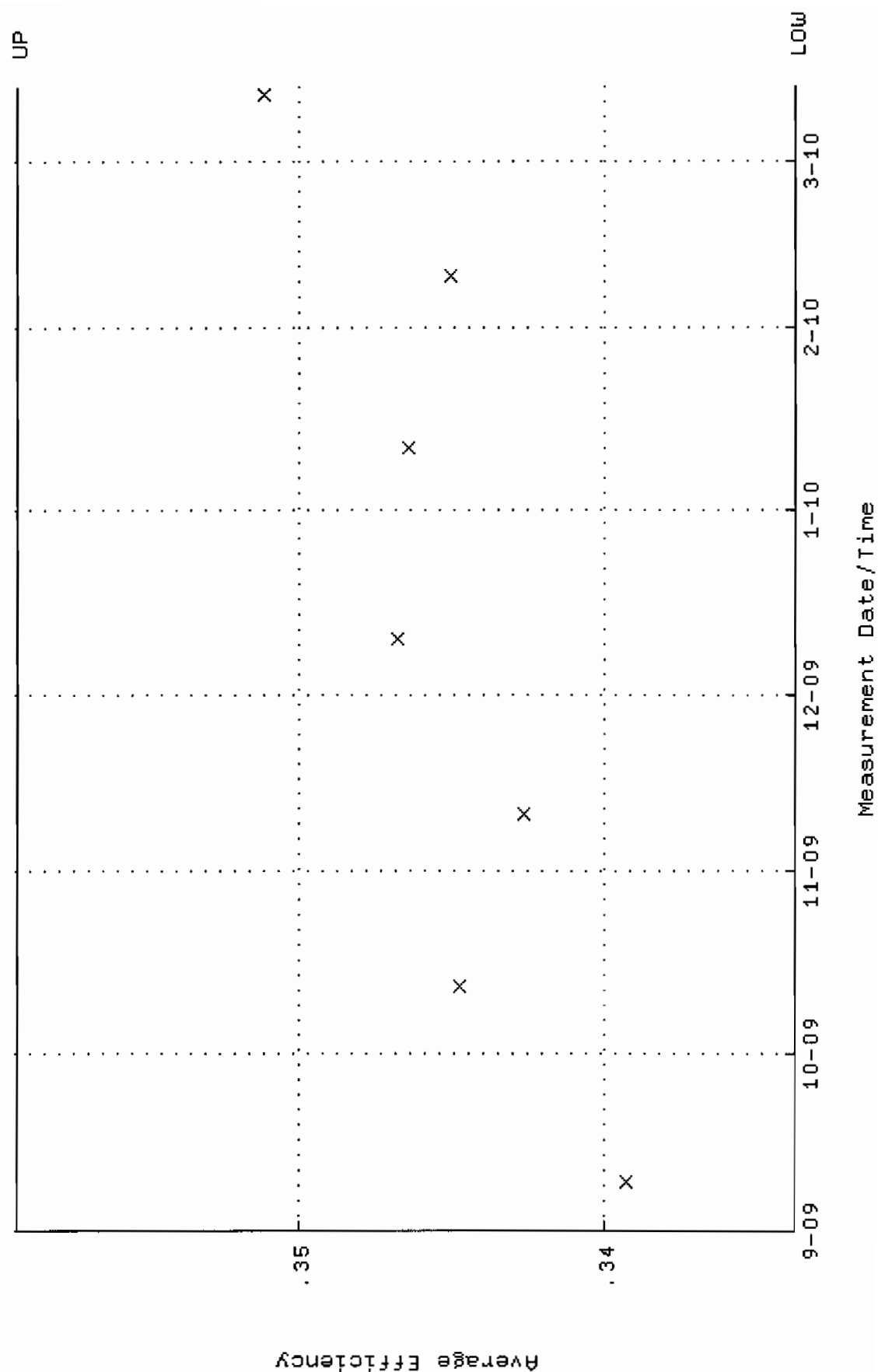


QA filename : DKA100:[ENV\_ALPHA.QA.B]B018.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 14:27:02 through 5-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02

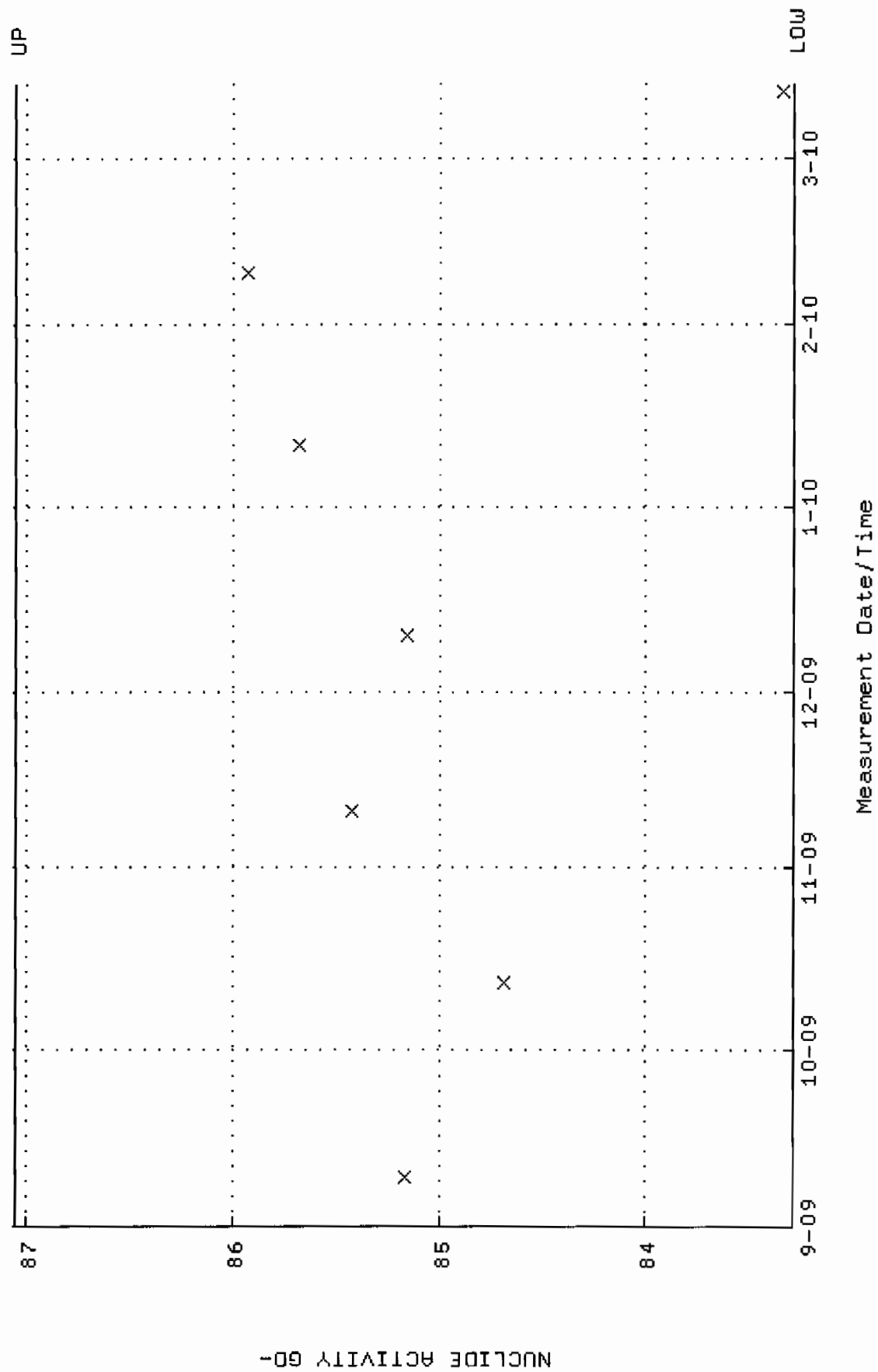




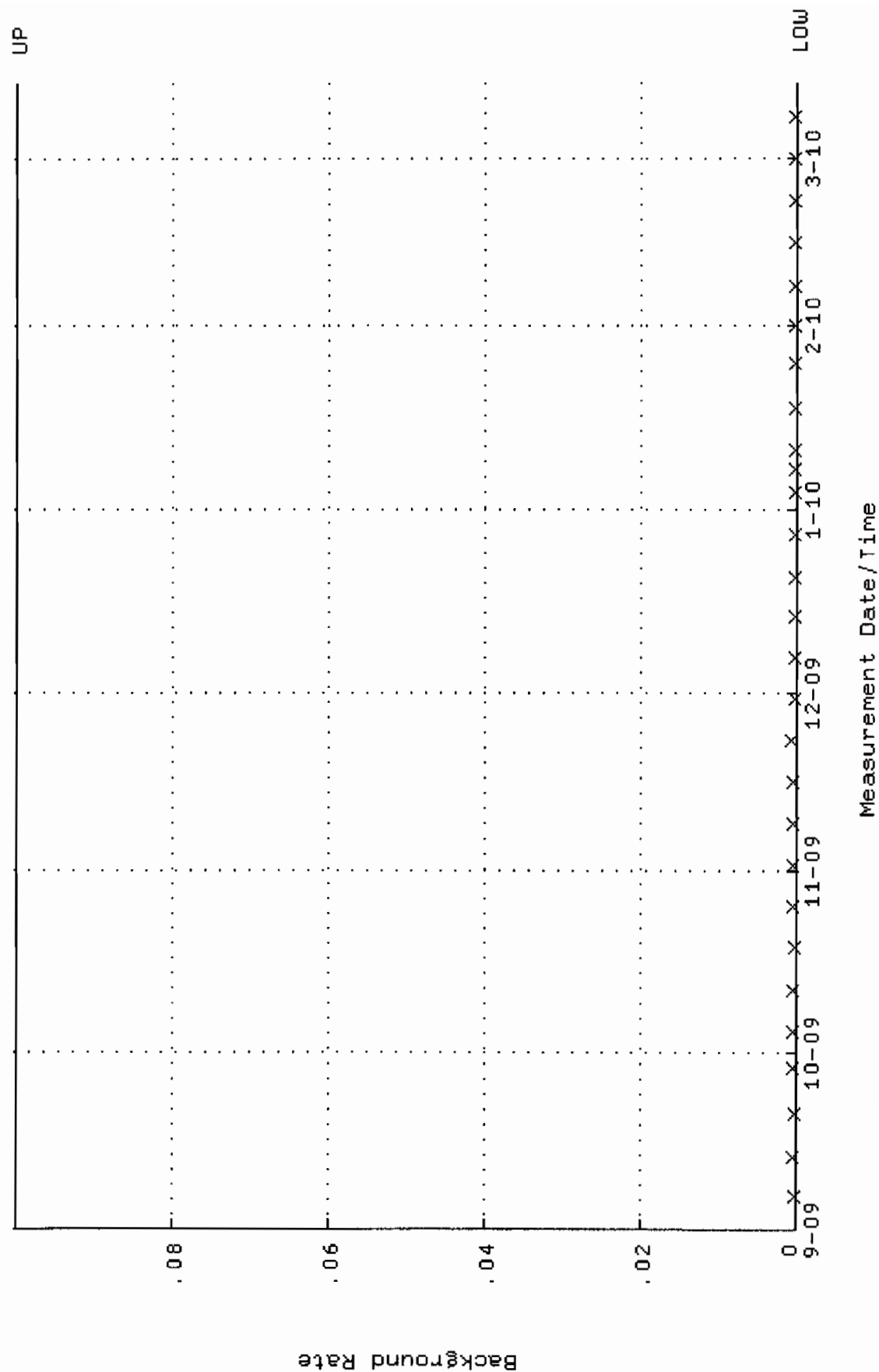
QA filename : DKA100:[ENV\_ALPHA.QA.W]W091.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 9-SEP-2009 09:27:49 through 13-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.333733 through 0.359273



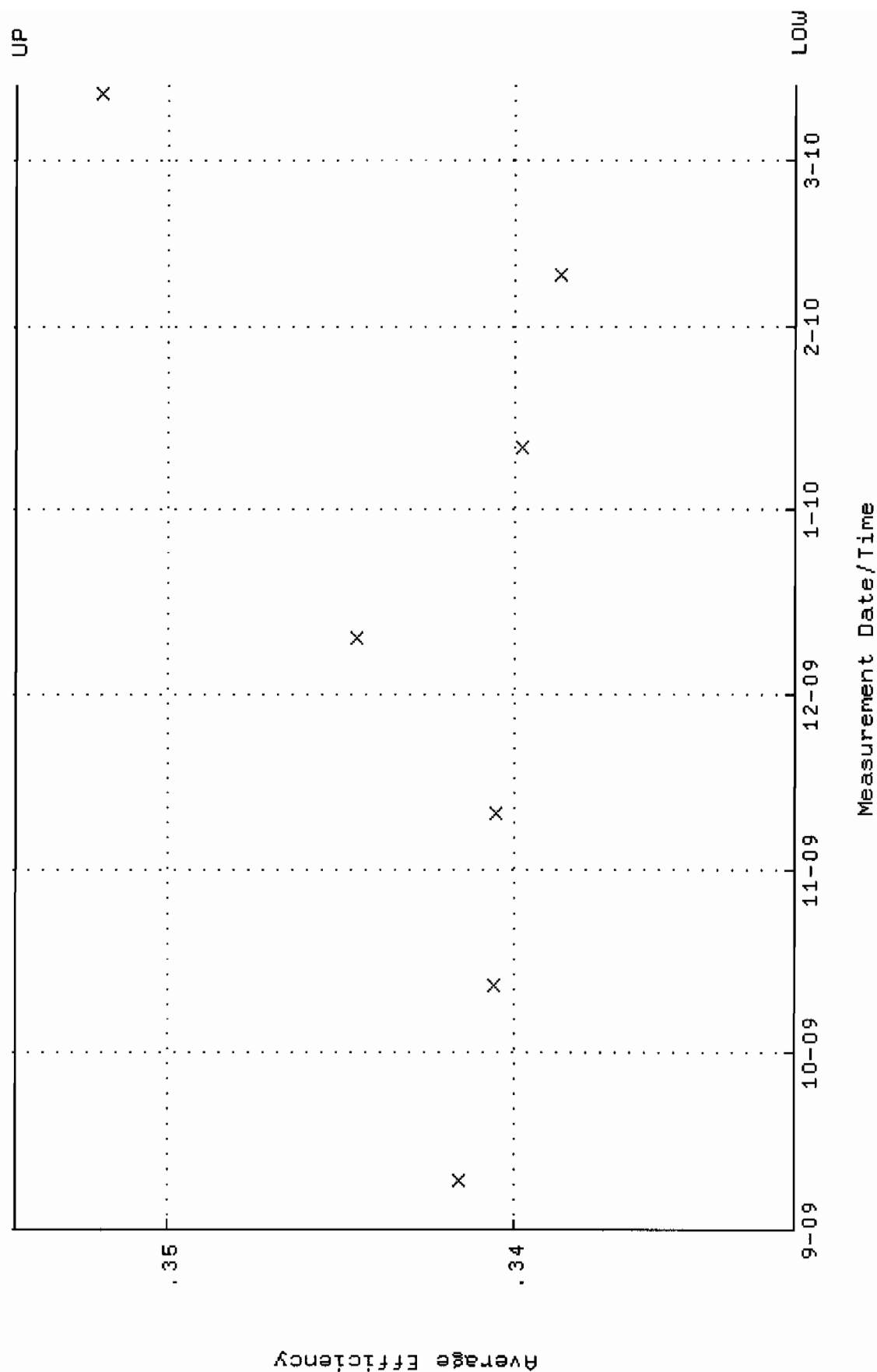
QA filename : DKA100:[ENV\_ALPHA.QA.W]W091.QAF;1  
 Parameter Name : NLACTIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 9-SEP-2009 09:27:49 through 13-MAR-2010 12:00:00  
 Lower/Upper Lmts: 83.2831 through 87.0563



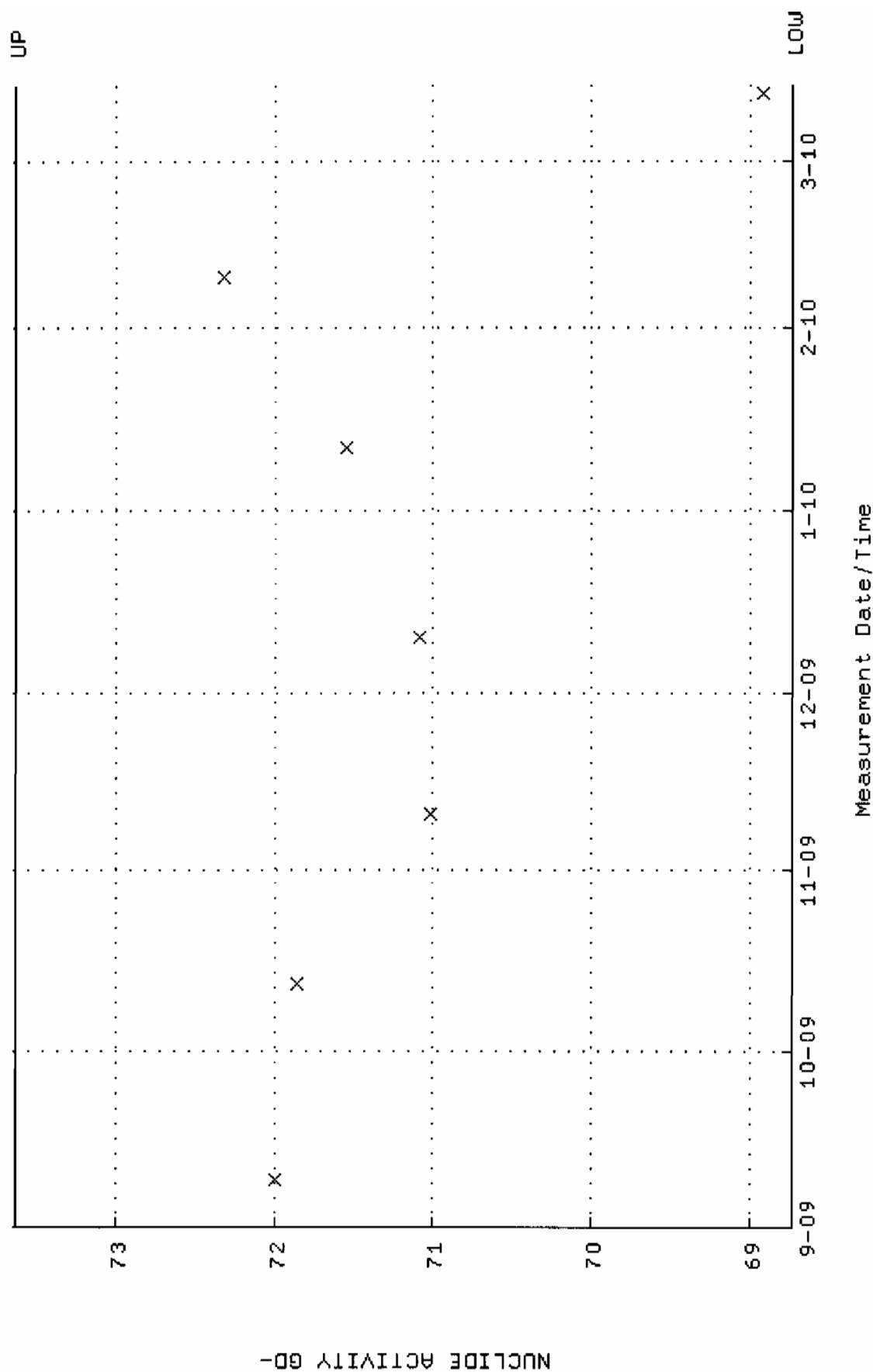
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 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 14:27:10 through 13-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



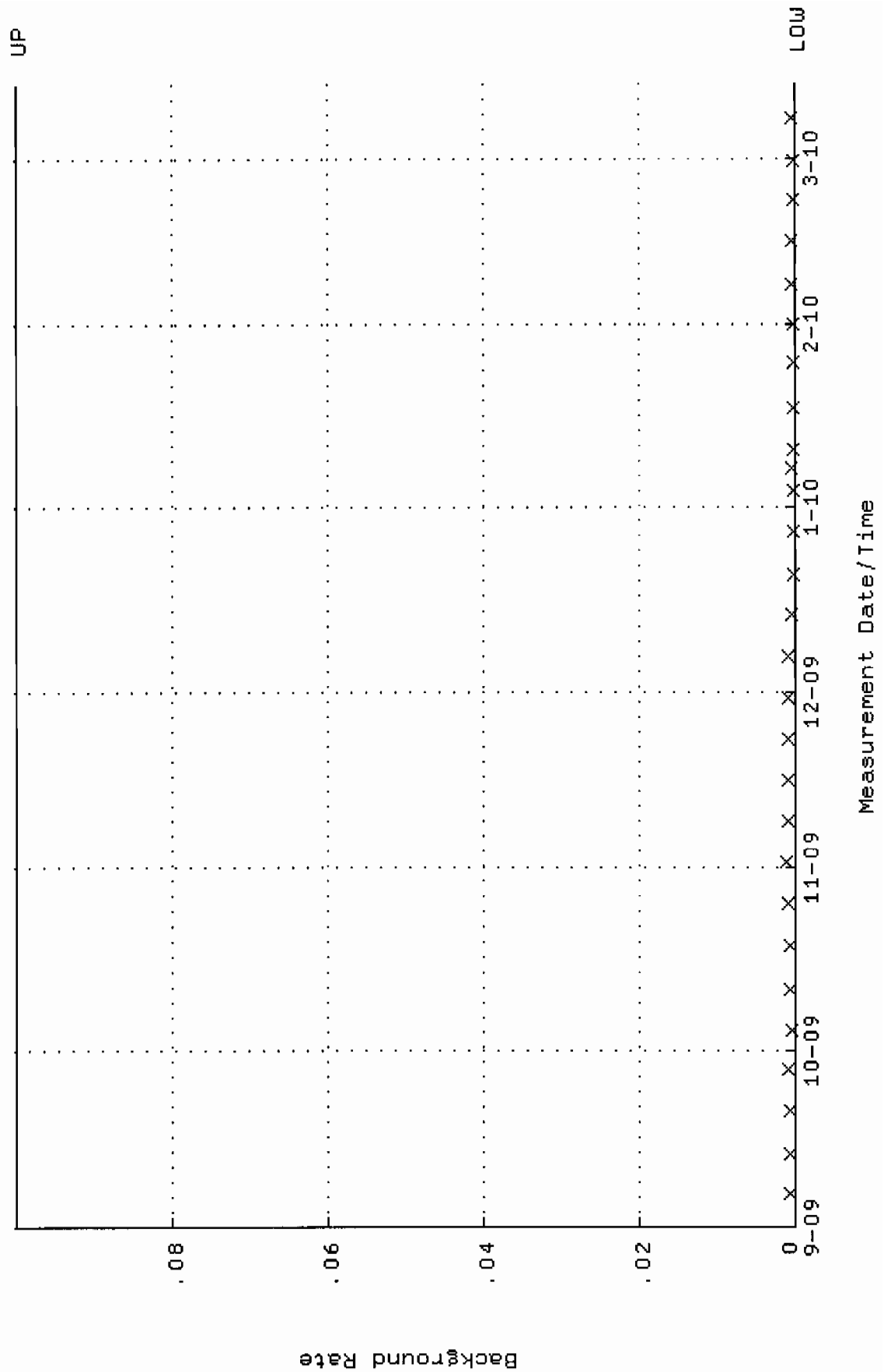
QA filename : DKA100:[ENV\_ALPHA.QA.W]W099.QAF;2  
 Parameter Name : AVRGEFF (Average Efficiency)  
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 Lower/Upper Lmts: 0.331877 through 0.354429



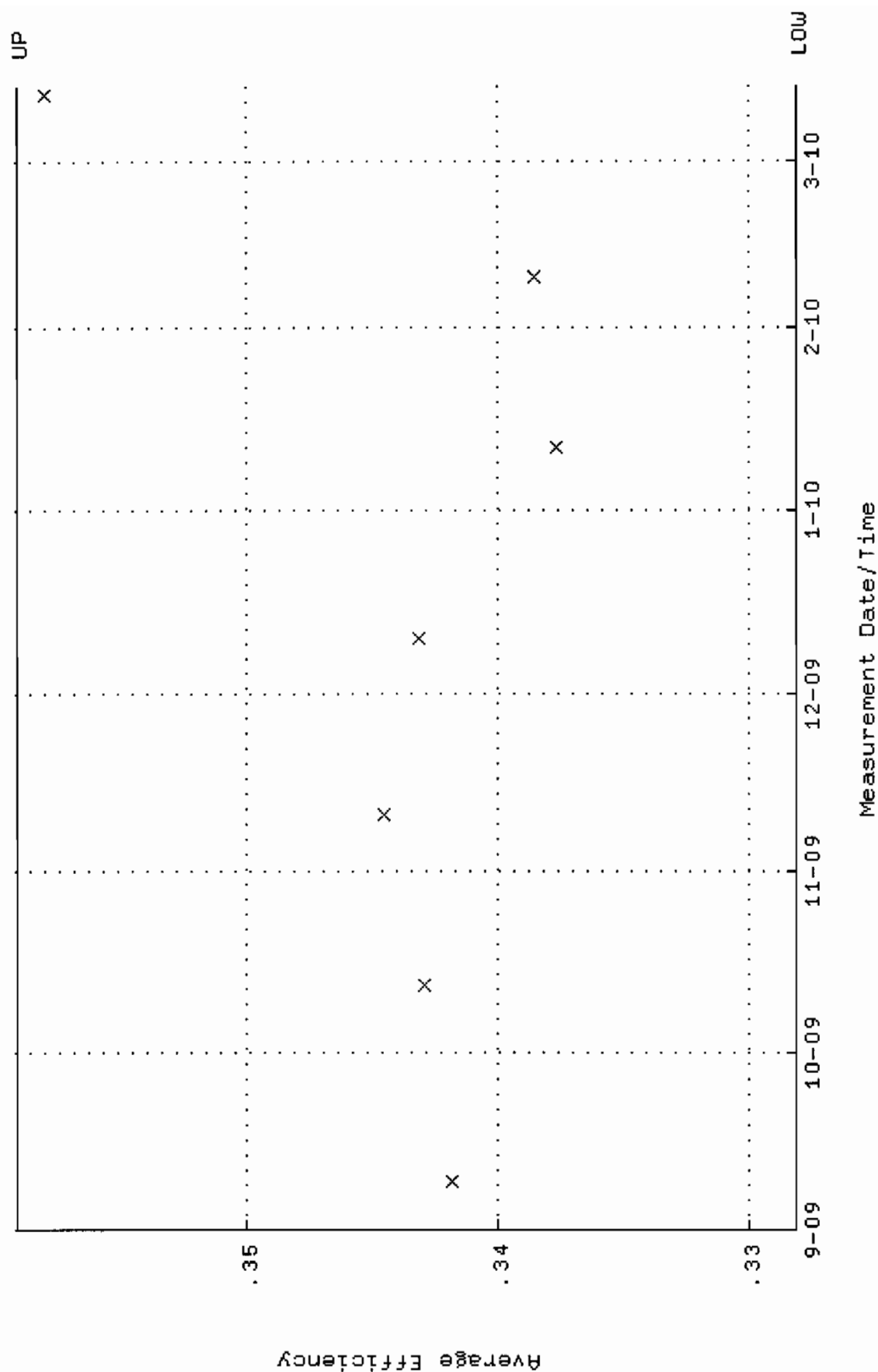
QA filename : DKA100:[ENV\_ALPHA.QA.W]W099.QAF;2  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 9-SEP-2009 09:27:50 through 13-MAR-2010 12:00:00  
 Lower/Upper Lmts: 68.7313 through 73.6359



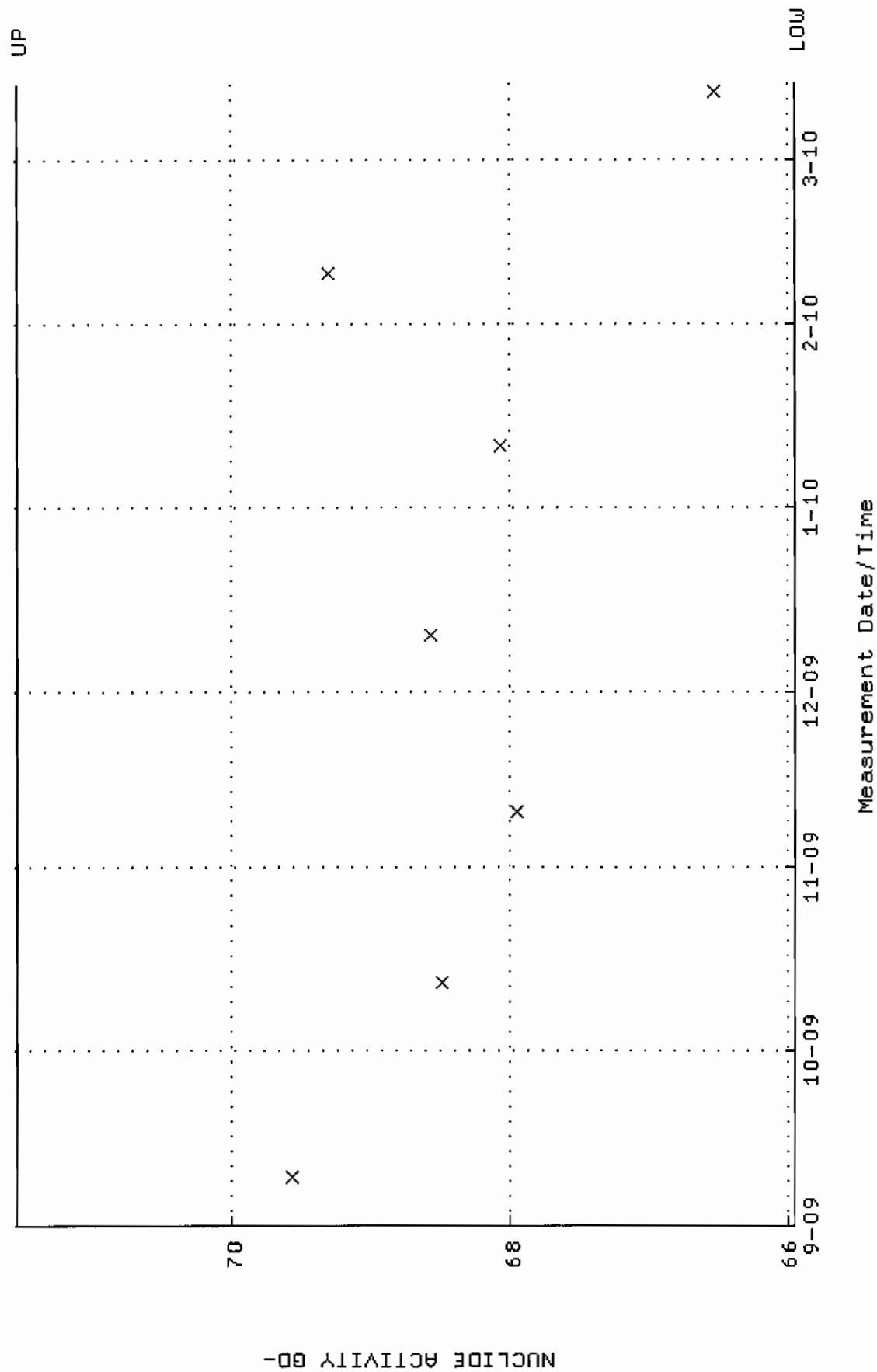
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Parameter Name : BACKRATE (Background Rate)  
Start/End Dates : 6-SEP-2009 14:27:11 through 13-MAR-2010 12:00:00  
Lower/Upper Lmts: 0.000000E+00 through 0.100000



QA filename : DKA100:[ENV\_ALPHA.QA.W]W100.QAF;2  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 9-SEP-2009 09:27:50 through 13-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.328134 through 0.359116



QA filename : DKA100:[ENV\_ALPHA.QA.W]W100.QAF;2  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 9-SEP-2009 09:27:50 through 13-MAR-2010 12:00:00  
 Lower/Upper Lmts: 65.9445 through 71.5395

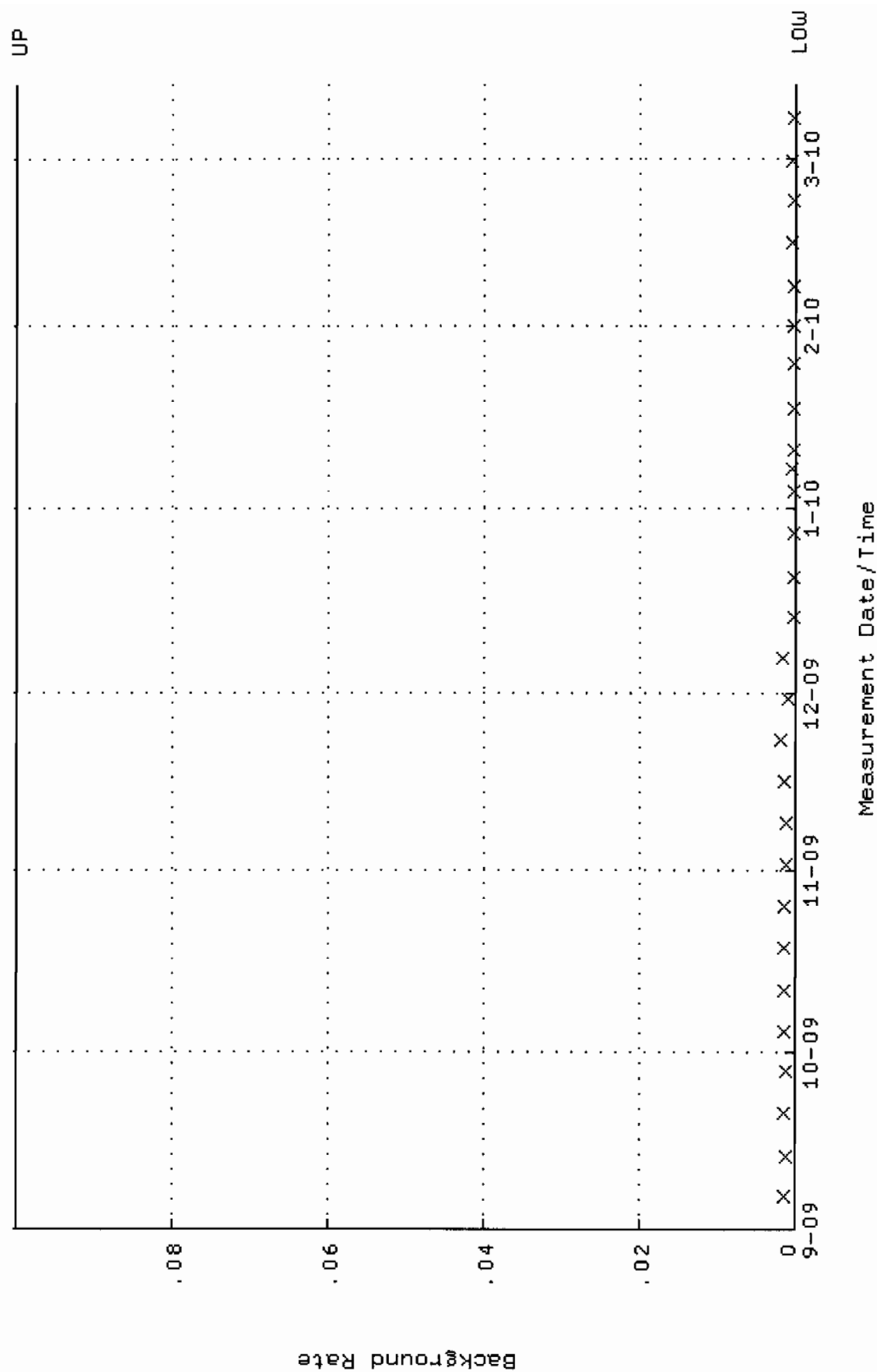




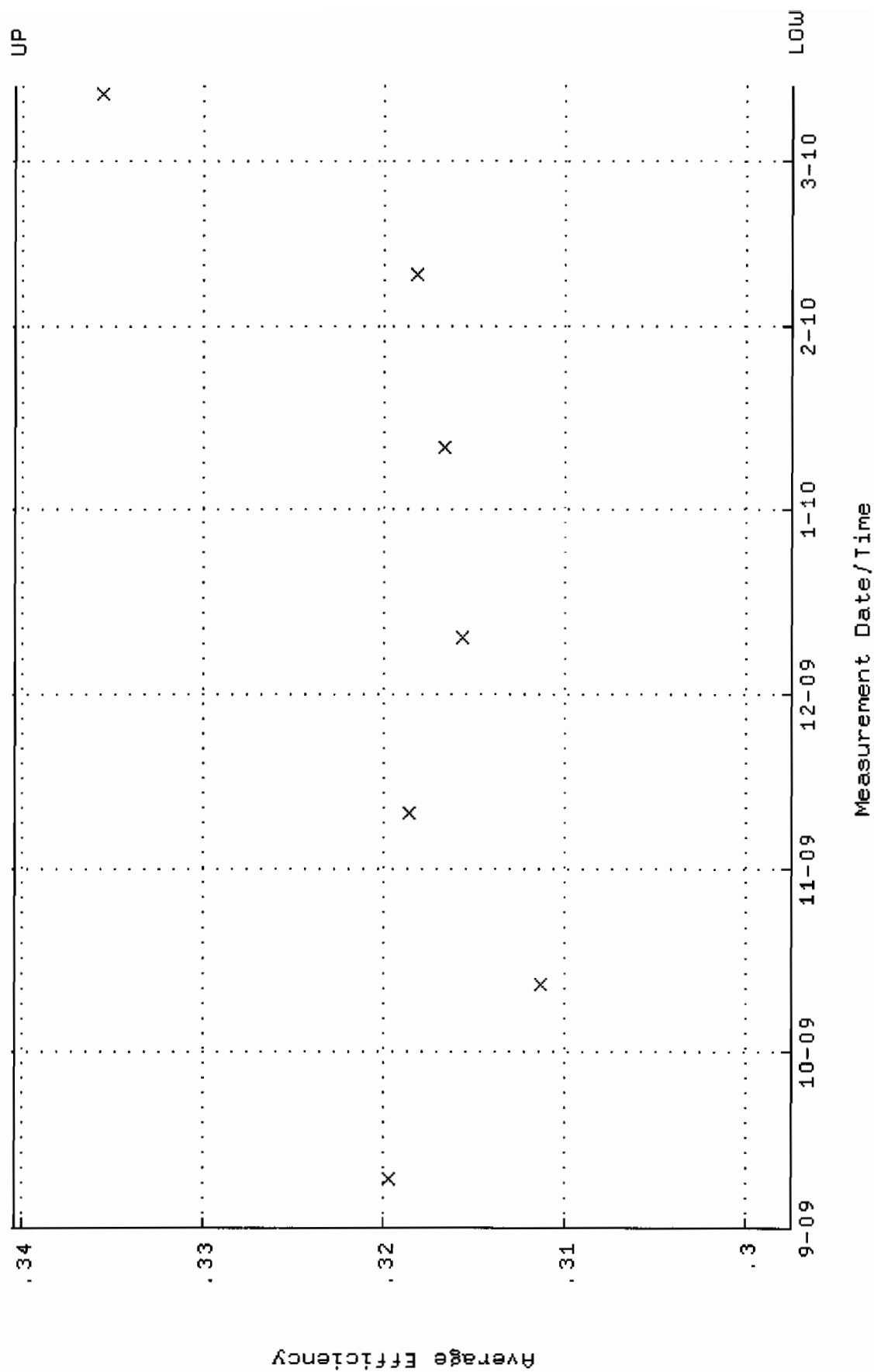
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: DKA100:[ENV_ALPHA.QA.B]B100.QAF;2
: BACKRATE (Background Rate)
: 6-SEP-2009 14:27:11 through 13-MAR-2010 14:27:11
Lower/Upper Lmts: 0.000000E+00 through 0.100000

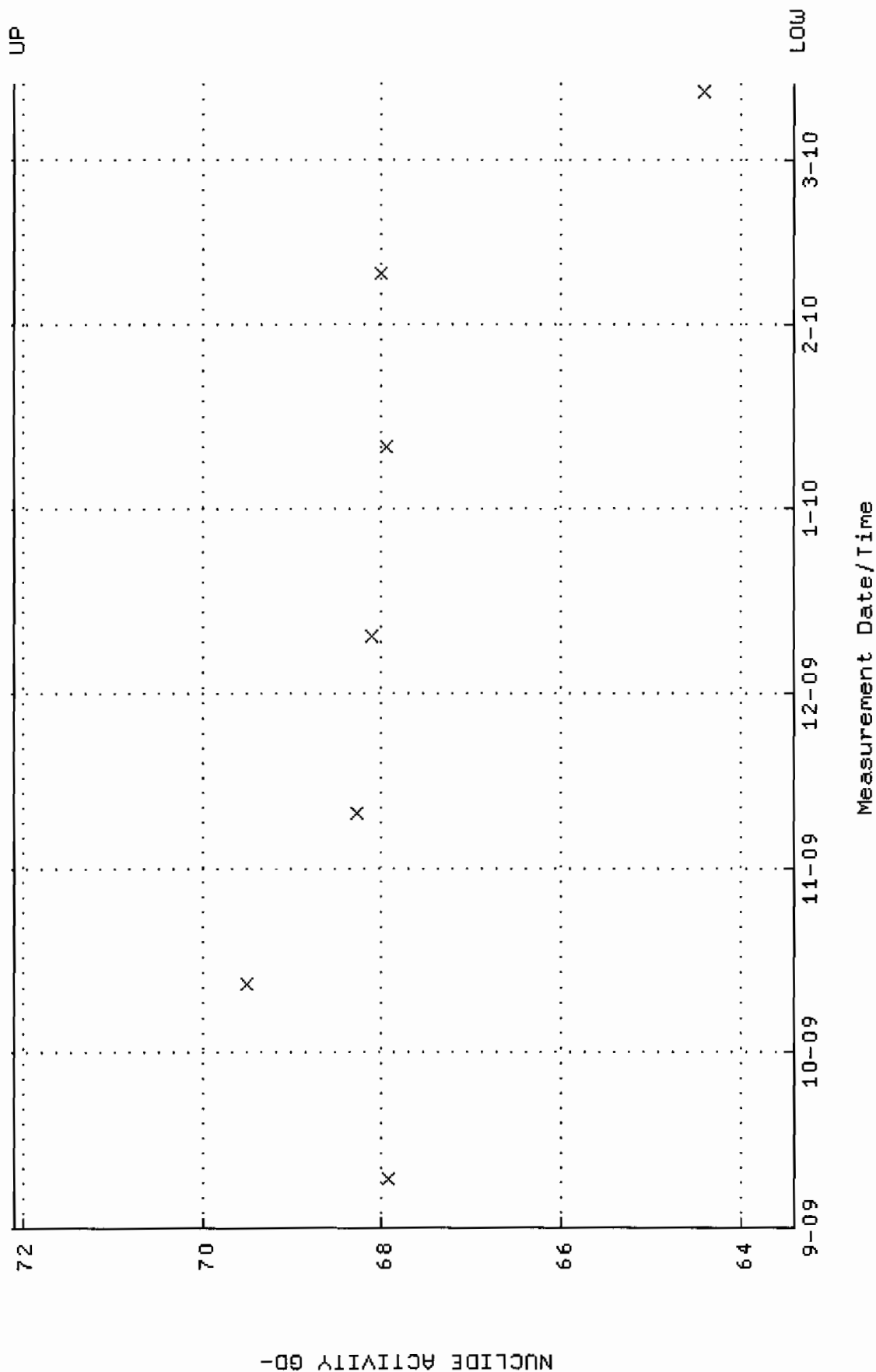
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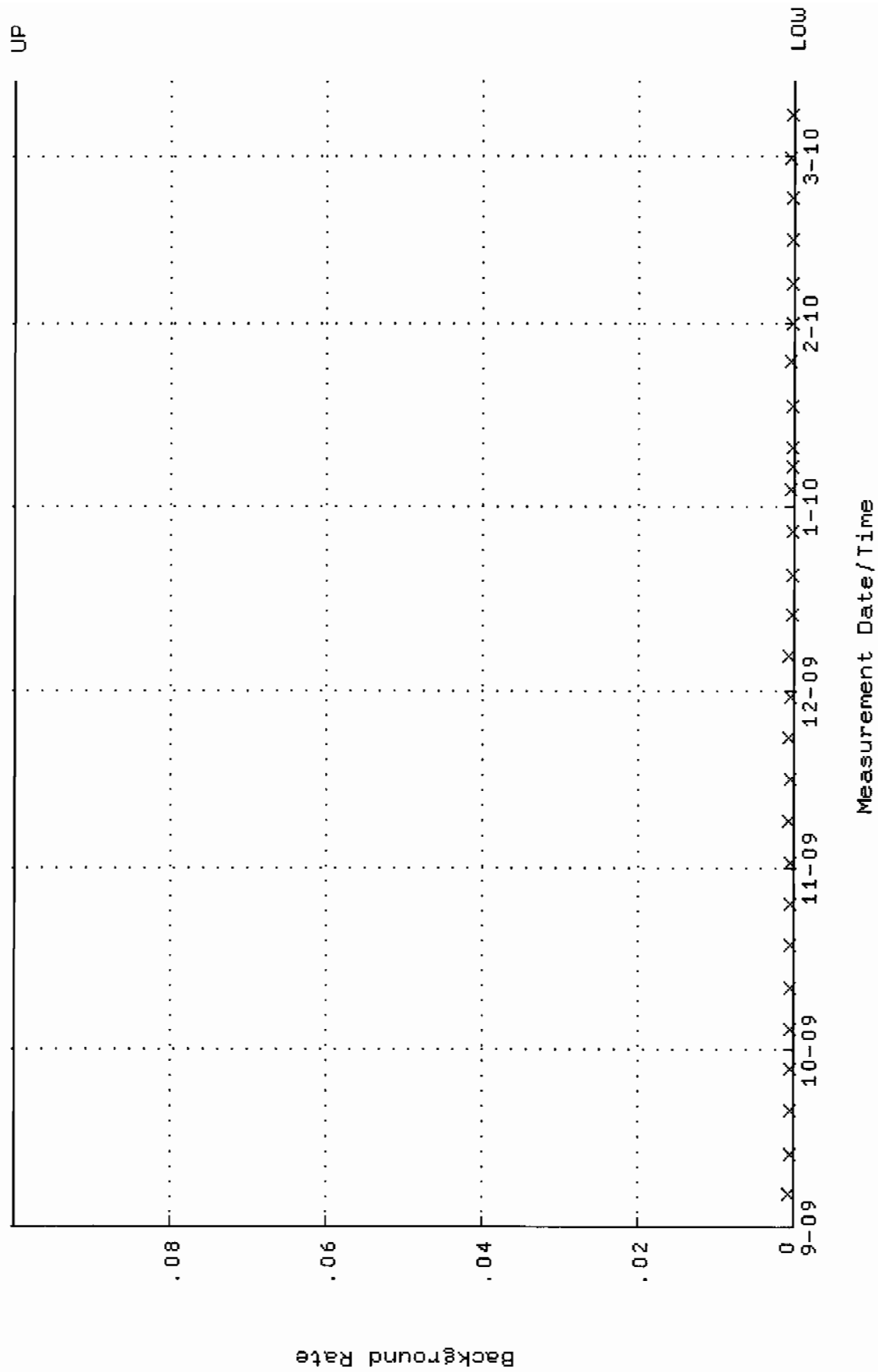
QA filename : DKA100:[ENV\_ALPHA.QA.W]w112.QAF;3  
 Parameter Name : AVRGEFF (Average Efficiency)  
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 Lower/Upper Lmts: 0.297499 through 0.340389



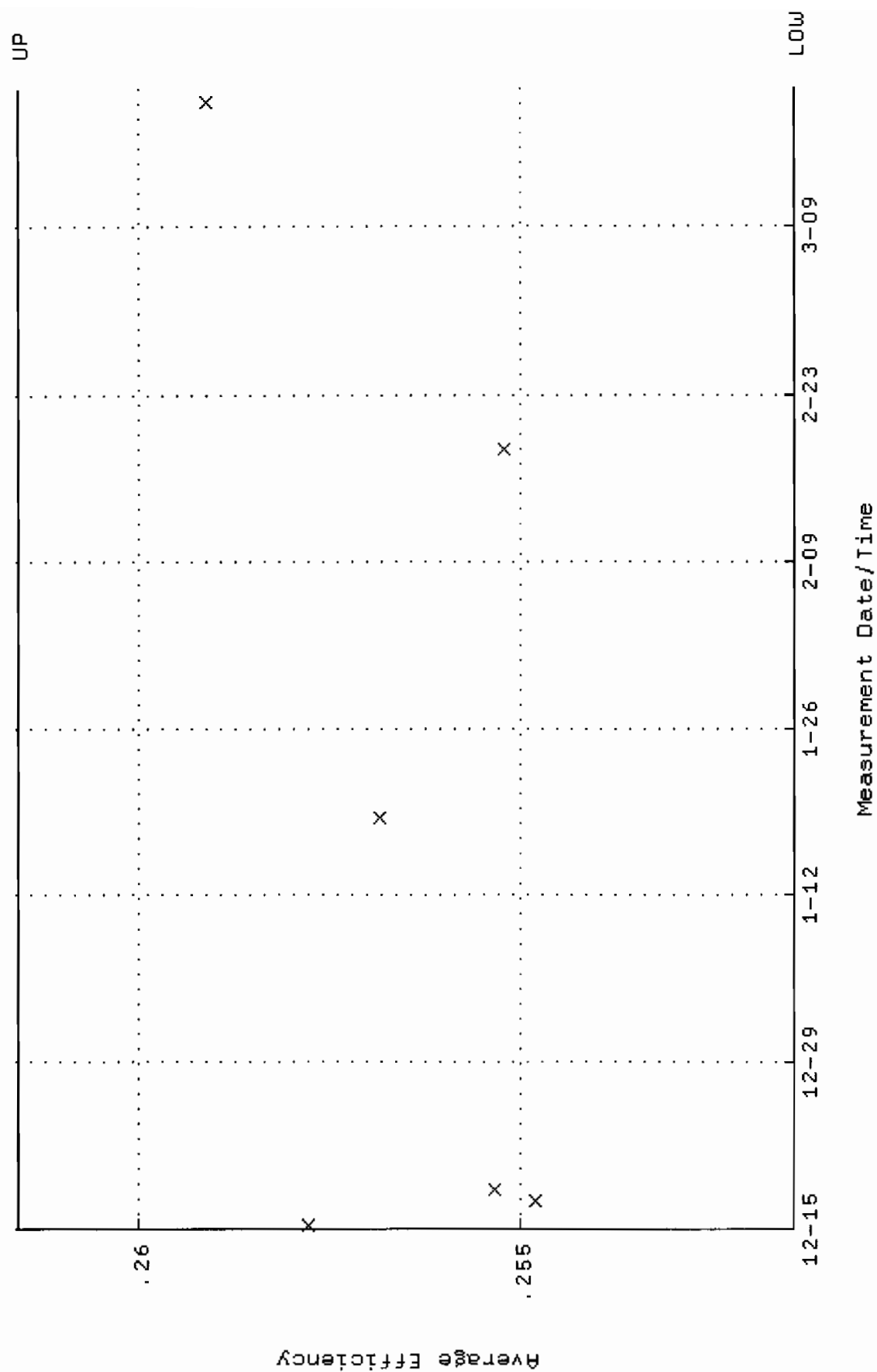
QA filename : DKA100:[ENV\_ALPHA.QA.W]W112.QAF;3  
 Parameter Name : NLACTIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 9-SEP-2009 09:27:52 through 13-MAR-2010 12:00:00  
 Lower/Upper Lmts: 63.4111 through 72.0947



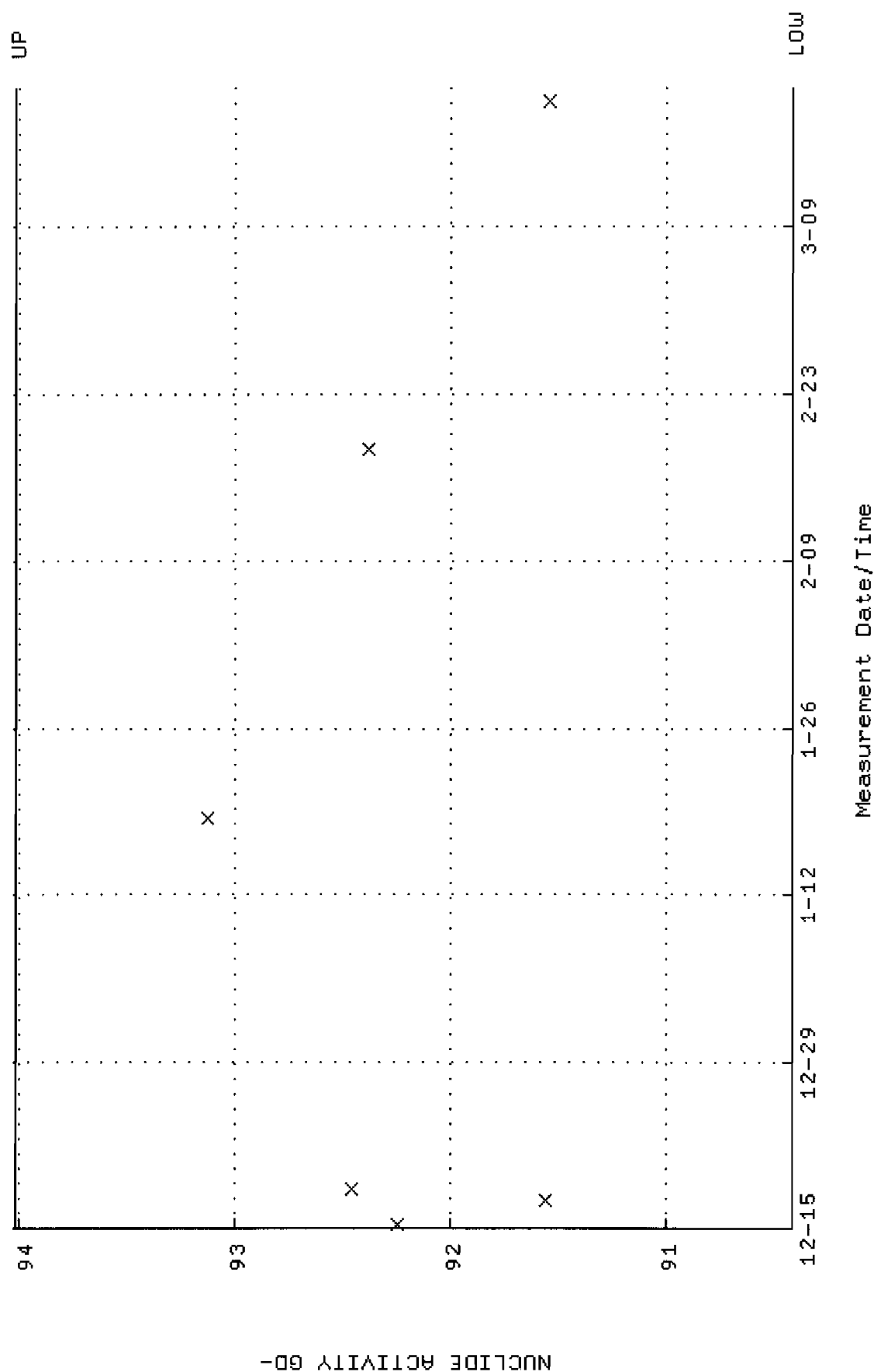
QA filename : DKA100:[ENV\_ALPHA.QA.B]B112.QAF;2  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 14:27:12 through 13-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



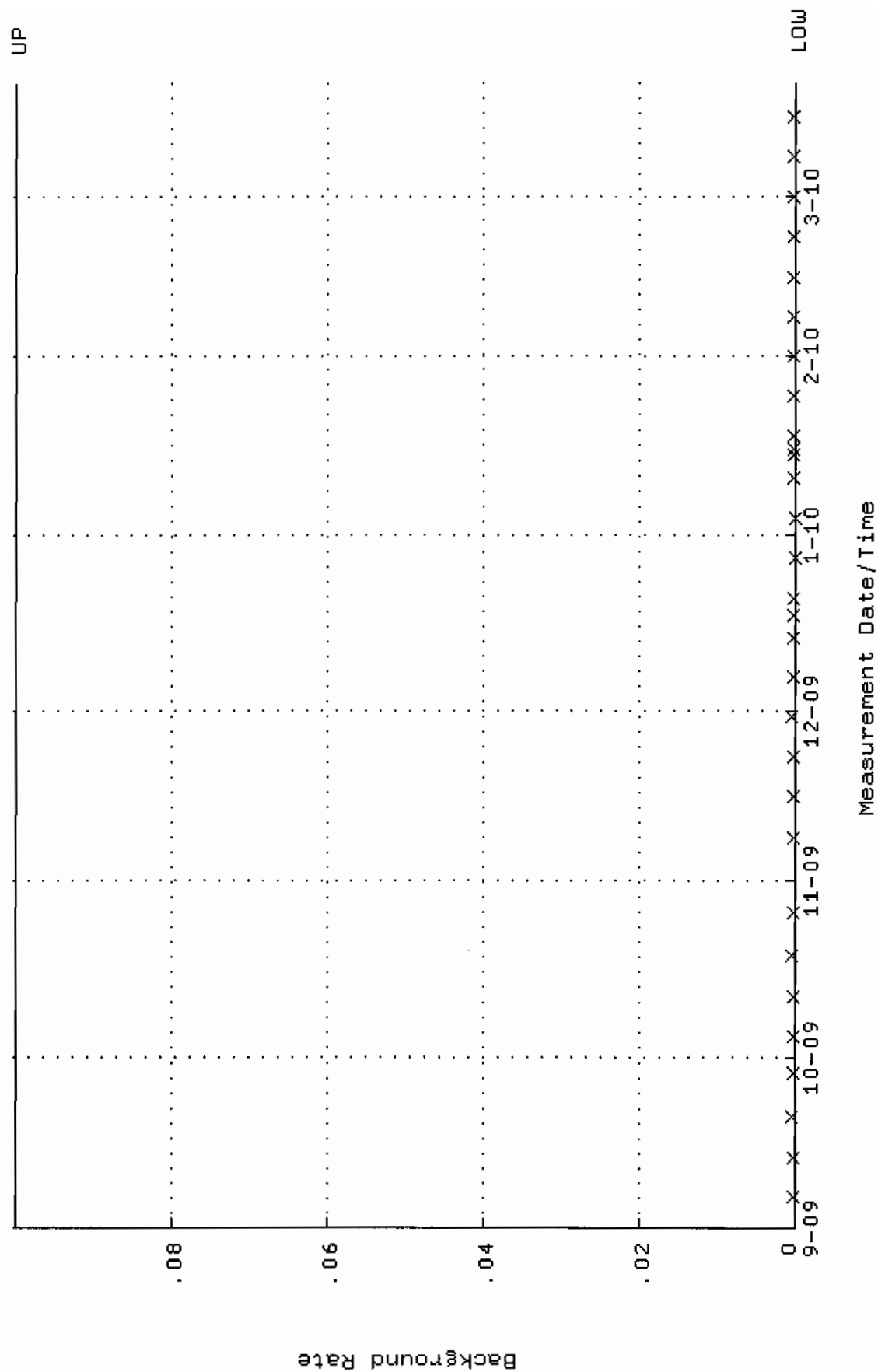
QA filename : DKA100:[ENV\_ALPHA.QA.W]W119.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 15-DEC-2009 06:21:52 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.251416 through 0.261570



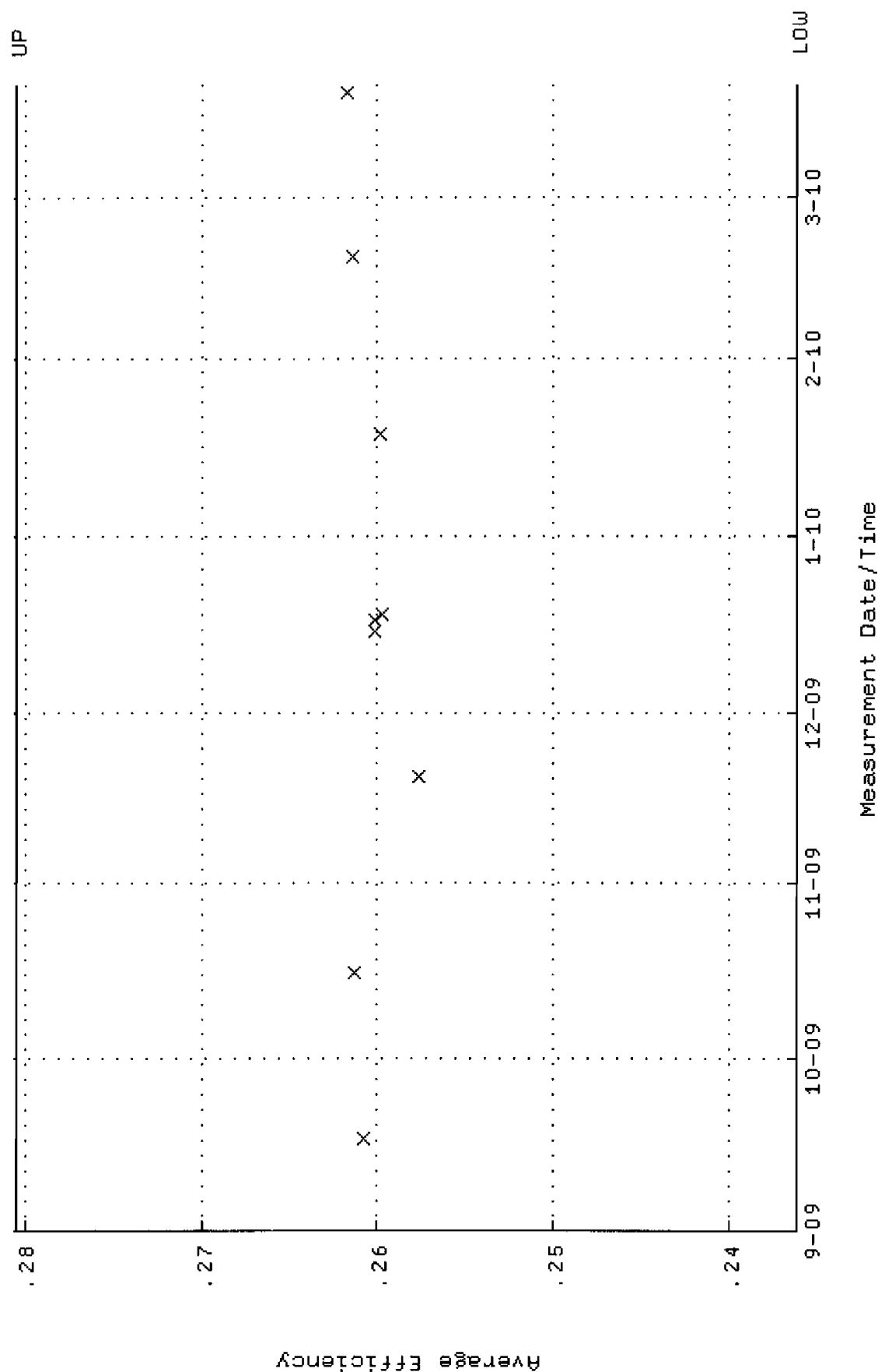
QA filename : DKA100:[ENV\_ALPHA.QA.W]w119.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 15-DEC-2009 06:21:52 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 90.4178 through 94.0134



QA filename : OKA100:[ENV\_ALPHA.QA.B]B119.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 15:40:34 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000

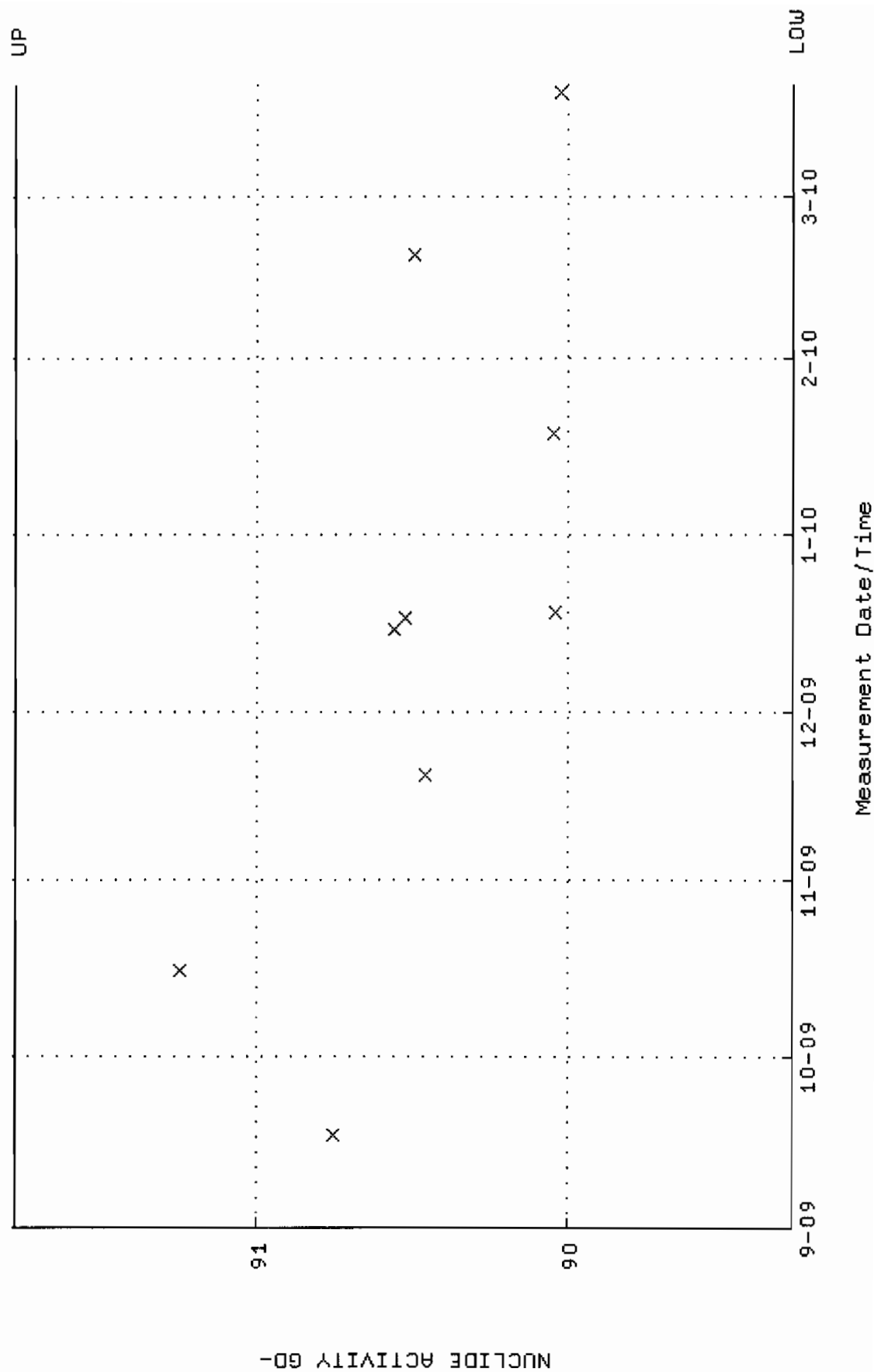


QA filename : DKA100:[ENV-ALPHA.QA.W]W120.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 17-SEP-2009 07:23:19 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.236163 through 0.280493

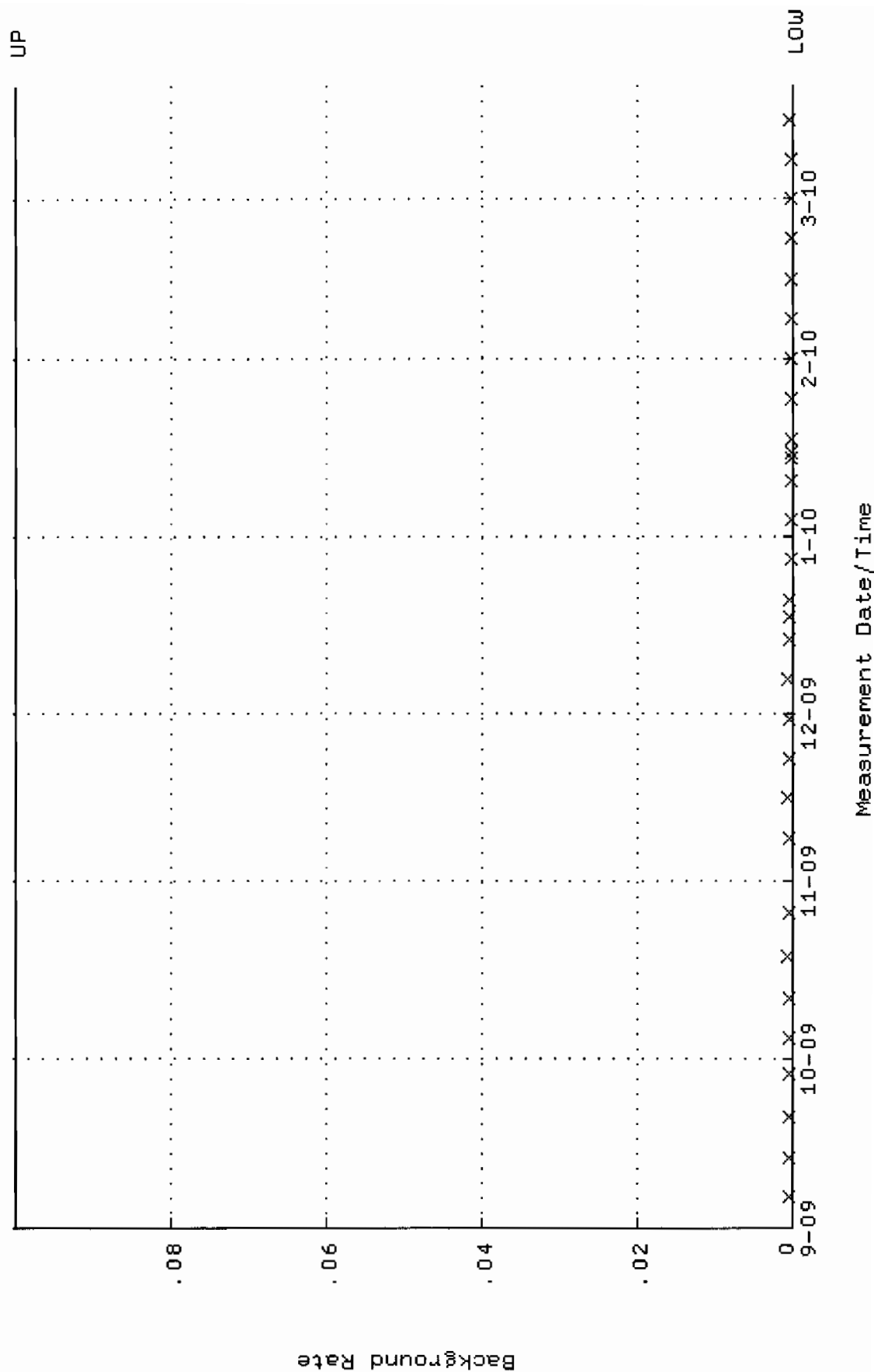




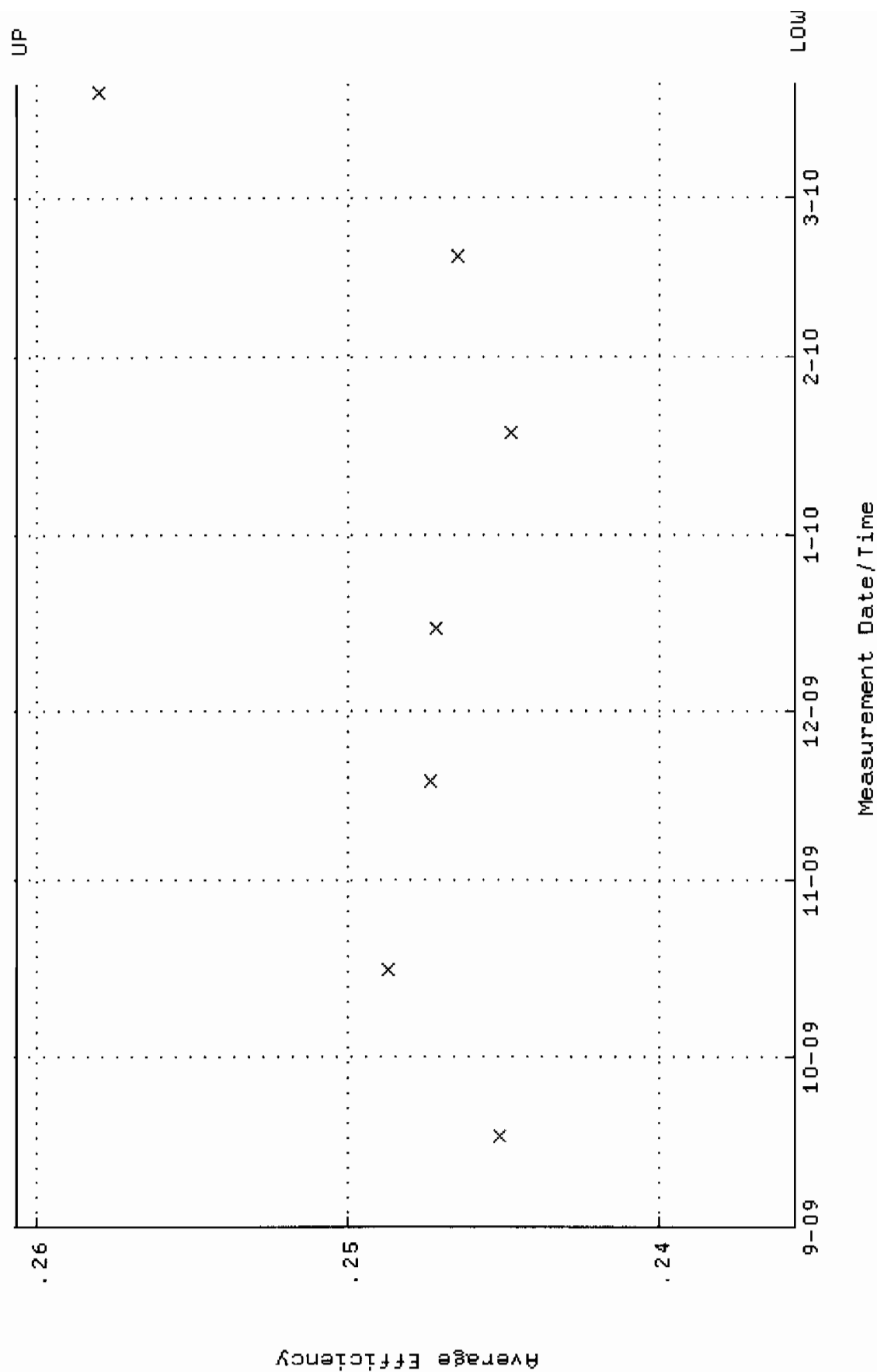
QA filename : DKA100:[ENV\_ALPHA.QA.W]w120.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 17-SEP-2009 07:23:19 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 89.2737 through 91.7767



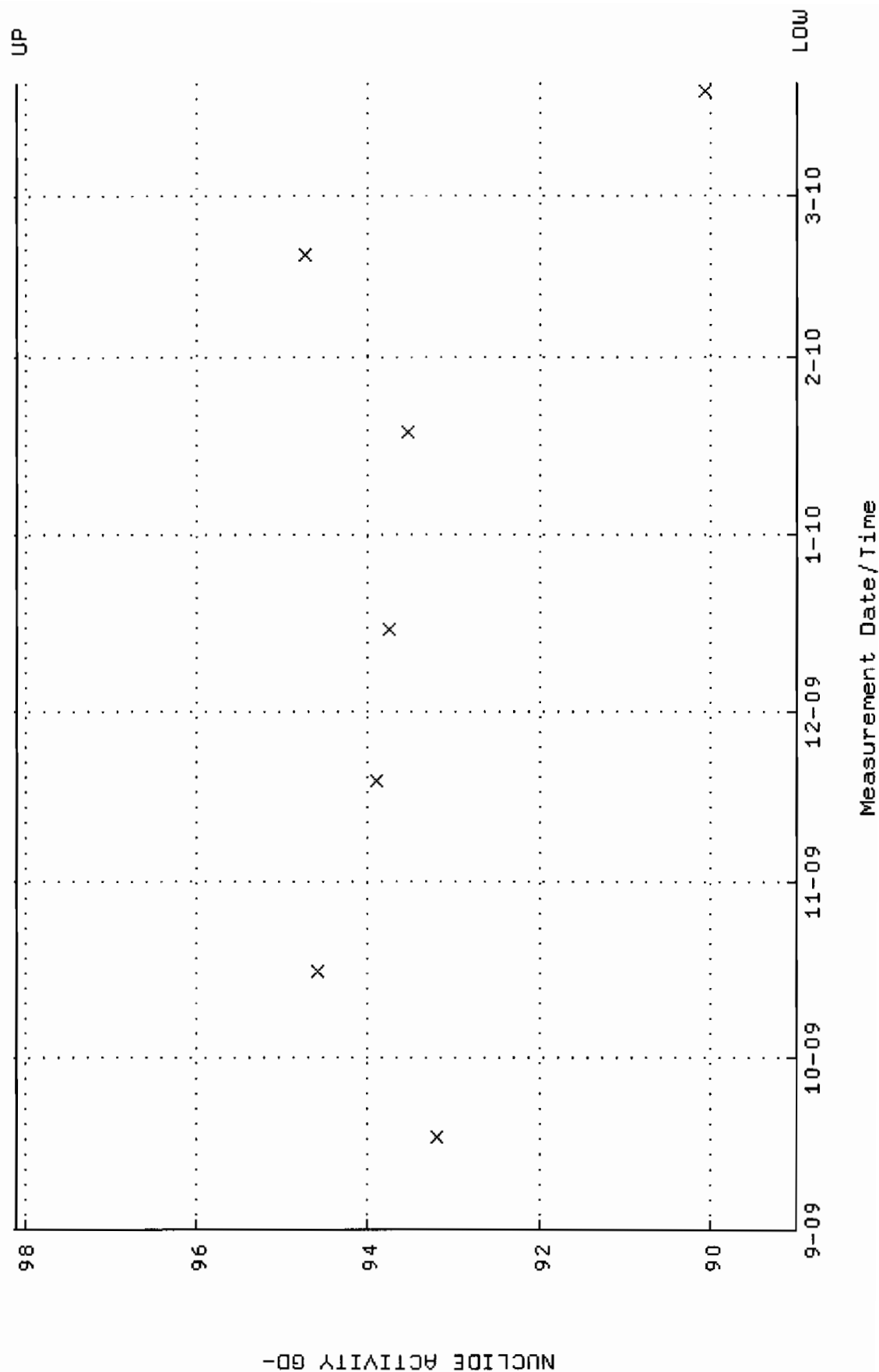
QA filename : DKA100:[ENV\_ALPHA.QA.B]B120.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 15:40:39 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



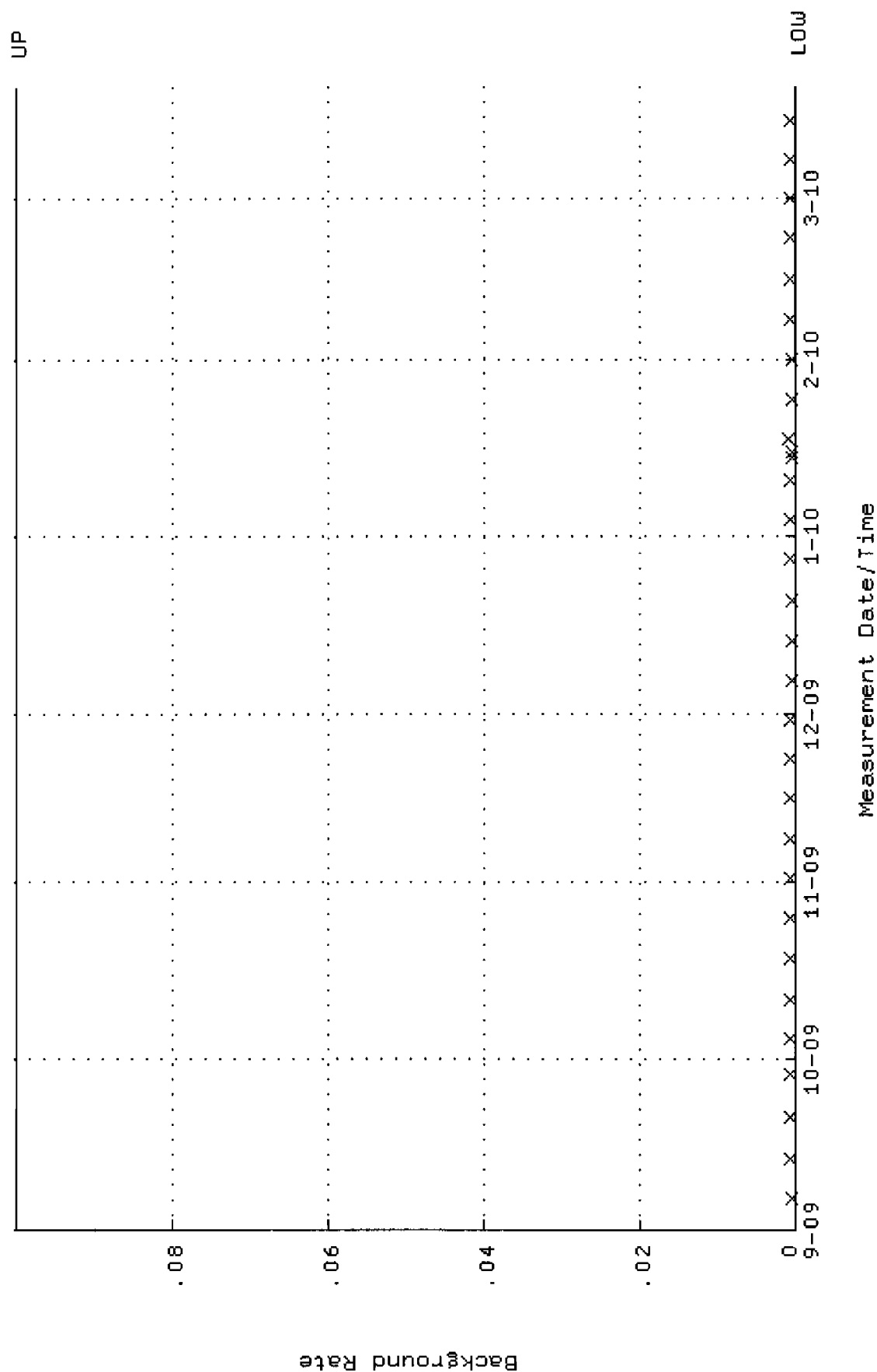
QA filename : DKA100:[ENV\_ALPHA.QA.W]W121.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 17-SEP-2009 07:23:26 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.235679 through 0.260639



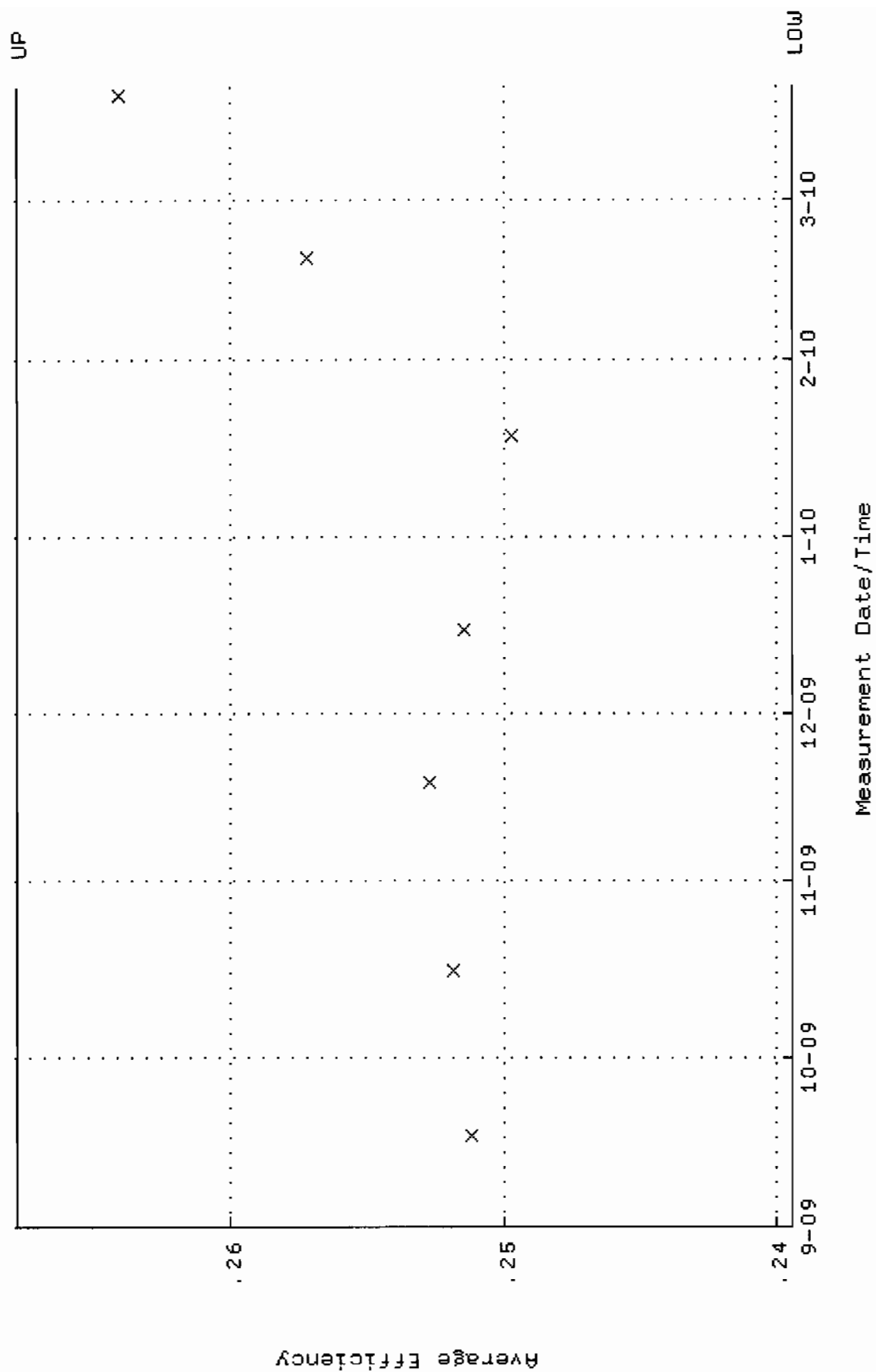
QA filename : DKA100:[ENV\_ALPHA.QA.W]U121.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 17-SEP-2009 07:23:26 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 88.9962 through 98.1012



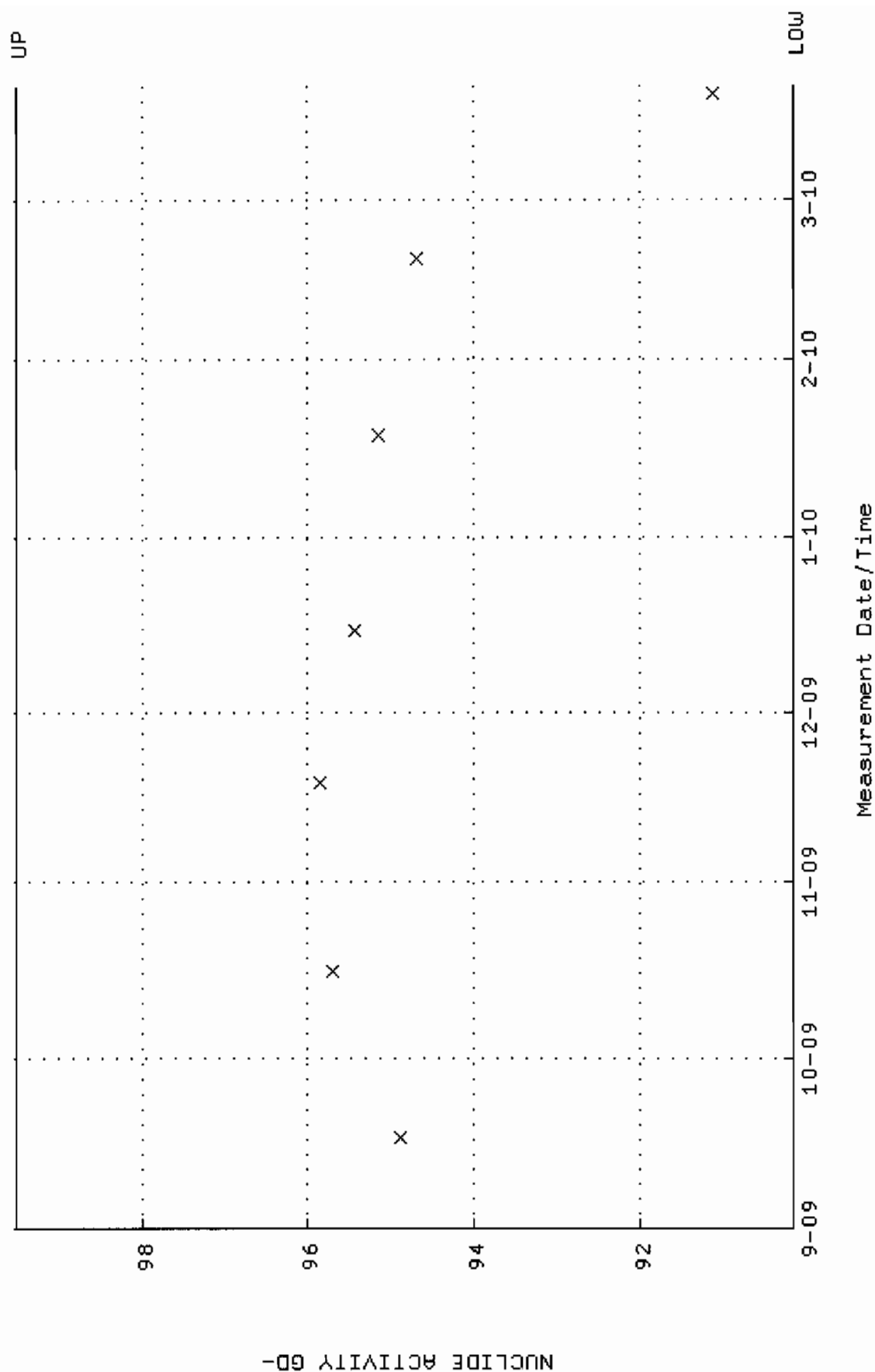
QA filename : DKA100:[ENV\_ALPHA.QA.B]B121.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 15:40:43 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



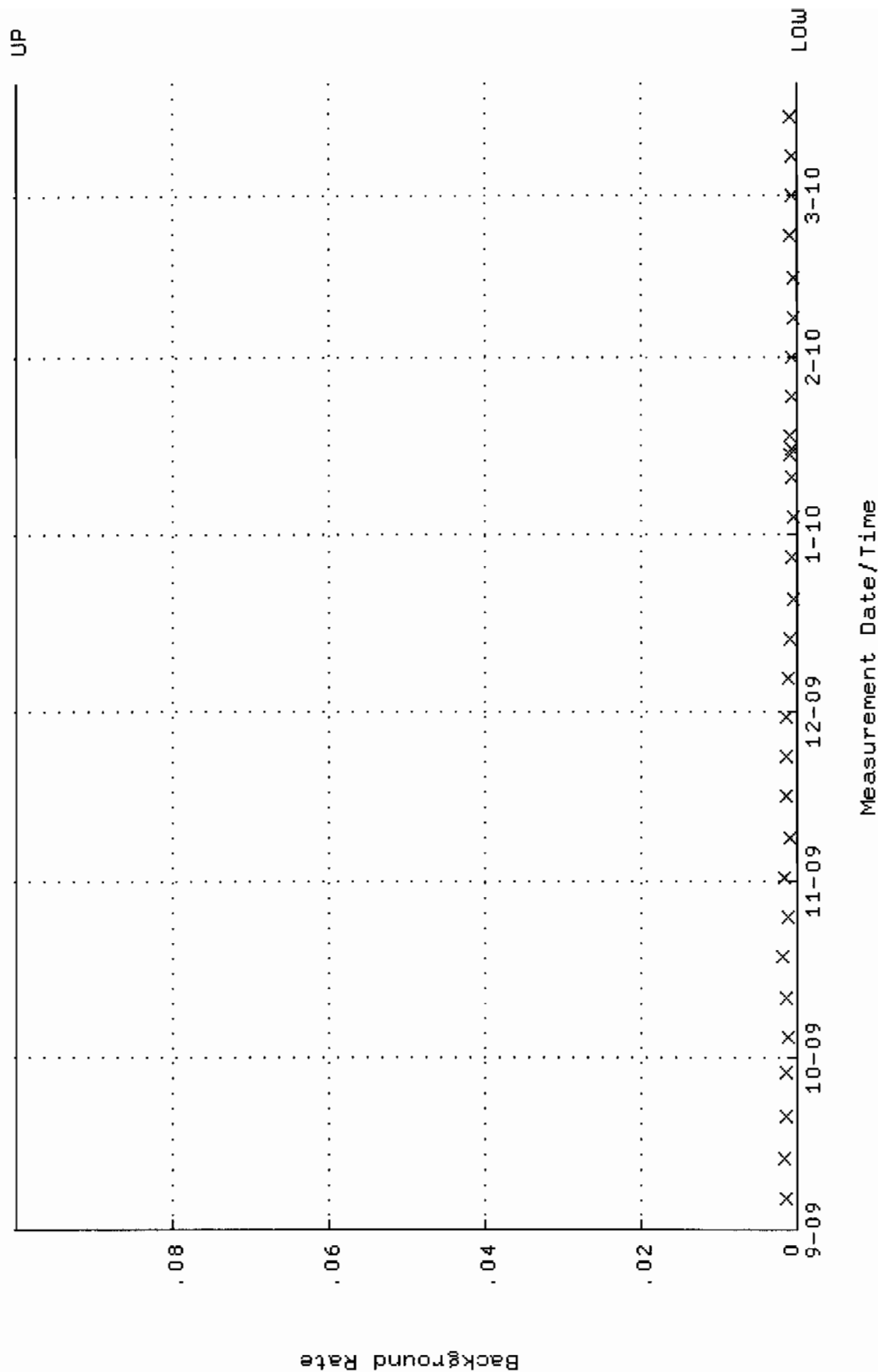
QA filename : DKA100:[ENV\_ALPHA.QA.W]w122.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 17-SEP-2009 07:23:33 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.239412 through 0.267828



QA filename : DKA100:[ENV\_ALPHA.QA.W]W122.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 17-SEP-2009 07:23:33 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 90.1506 through 99.5122

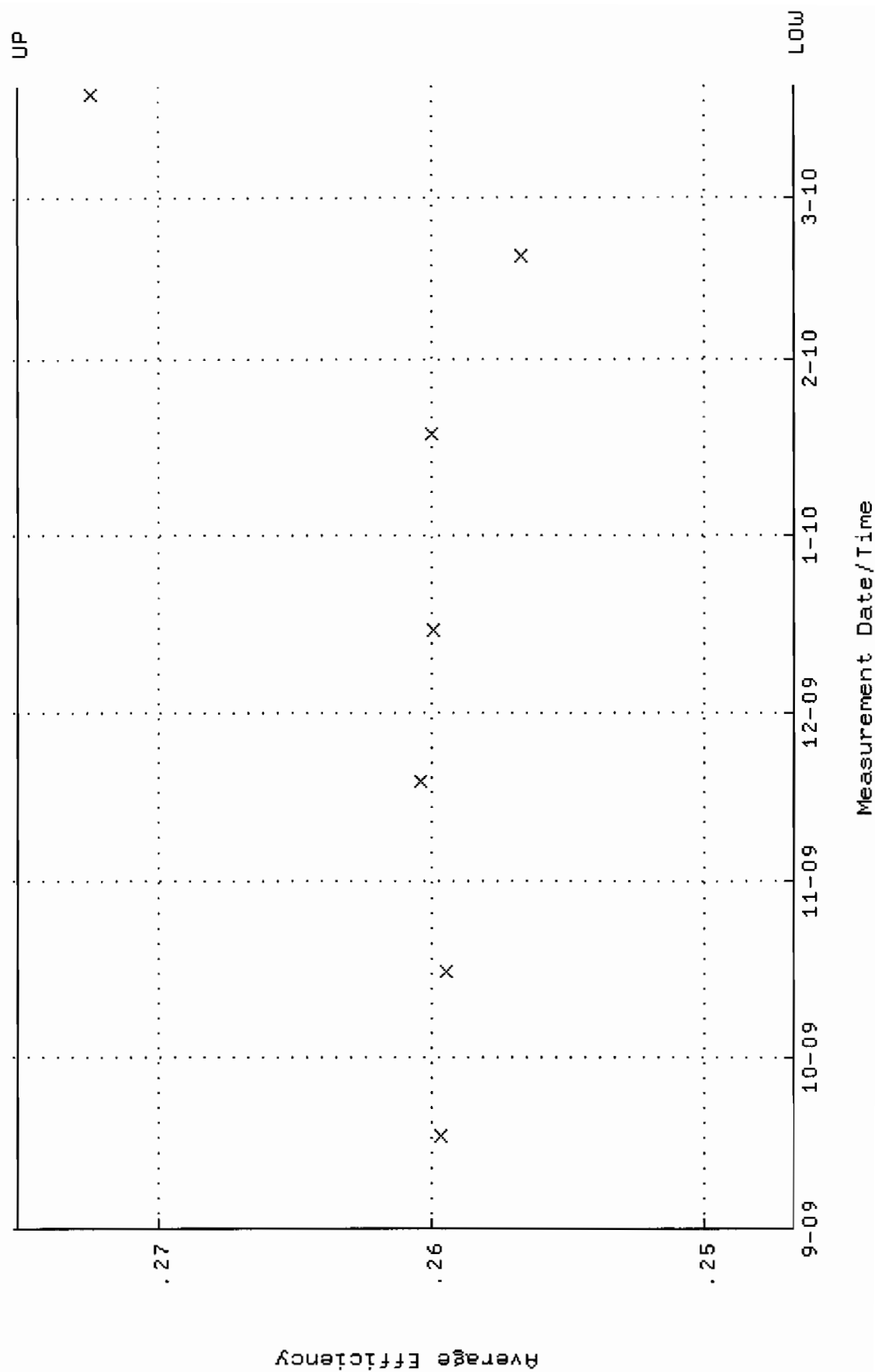


QA filename : DKA100:[ENV\_ALPHA.QA.B]B122.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 15:40:48 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000

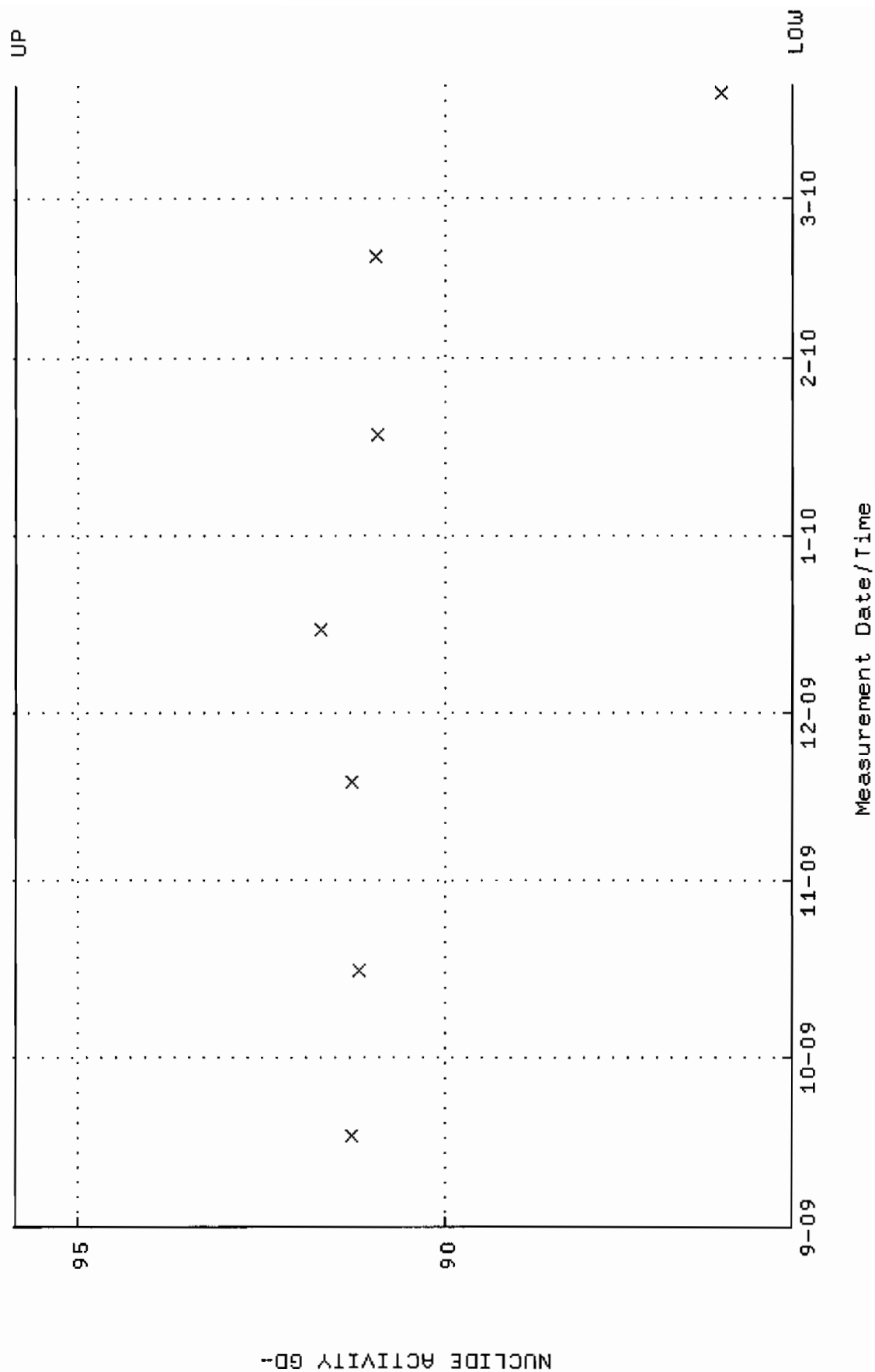




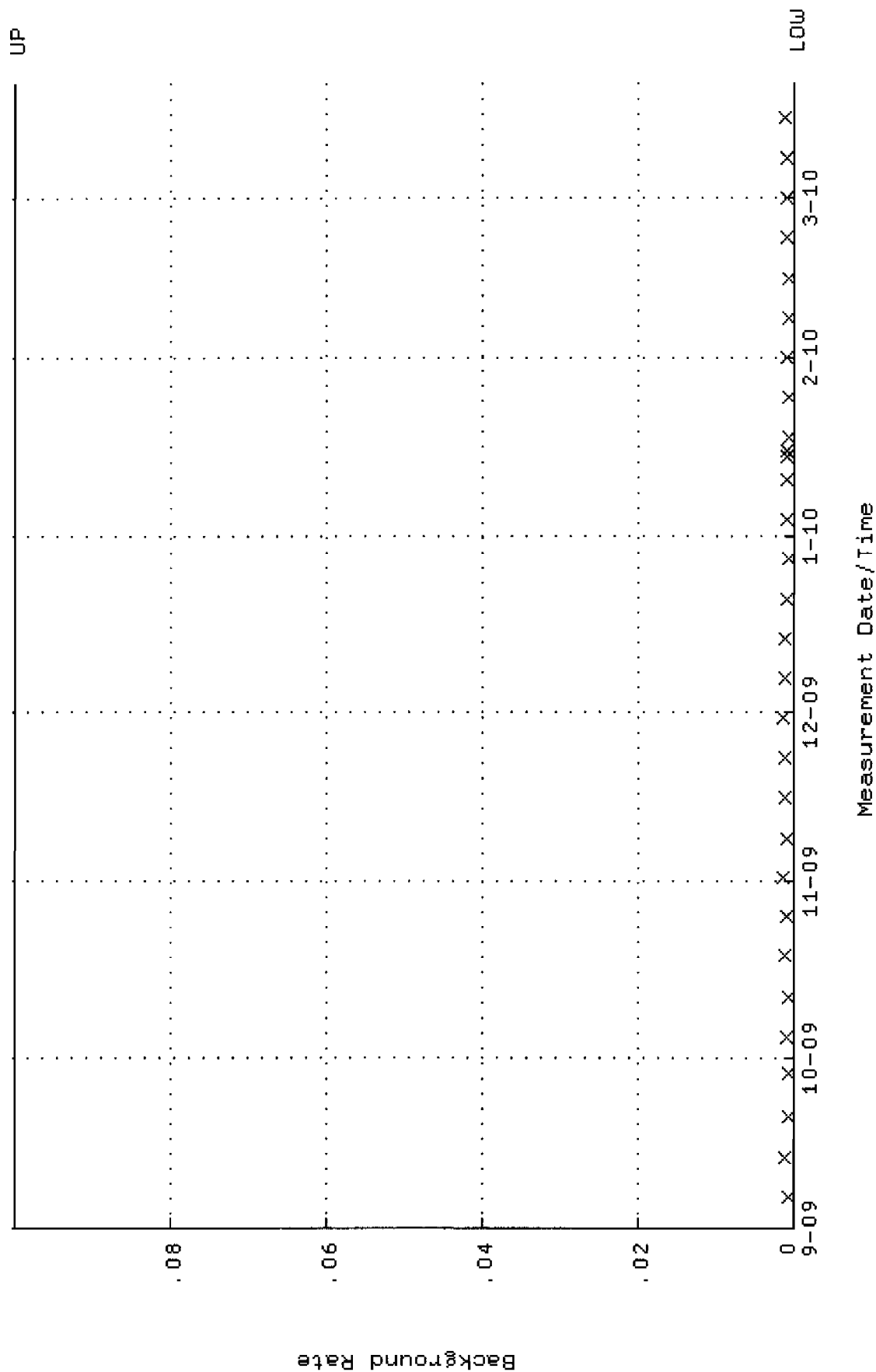
QA filename : DKA100:[ENV\_ALPHA.QA.W]U123.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 17-SEP-2009 07:23:40 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.246718 through 0.275204



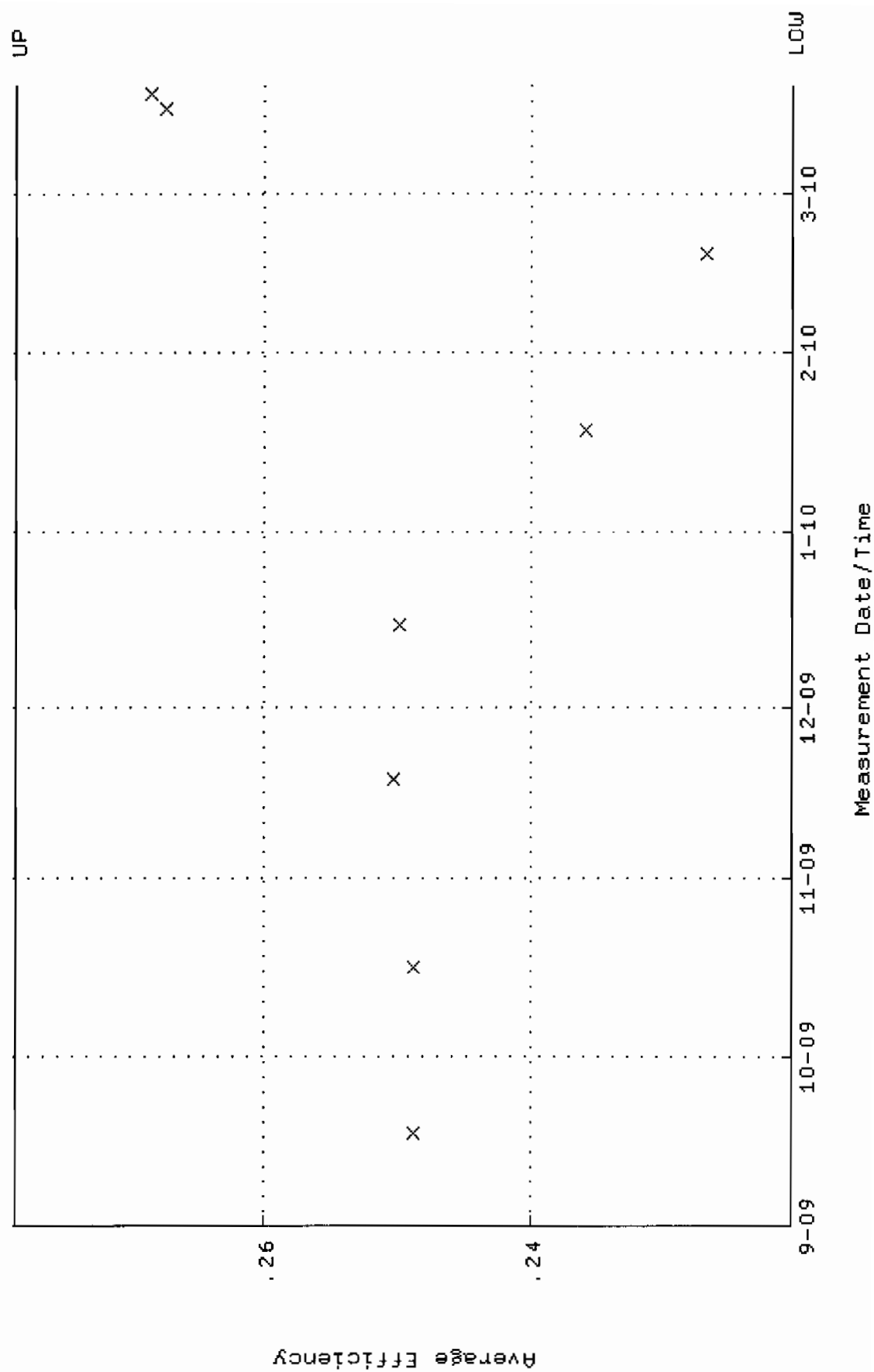
QA filename : DKA100:[ENV\_ALPHA.QA.W]W123.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 17-SEP-2009 07:23:40 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 85.2791 through 95.8339



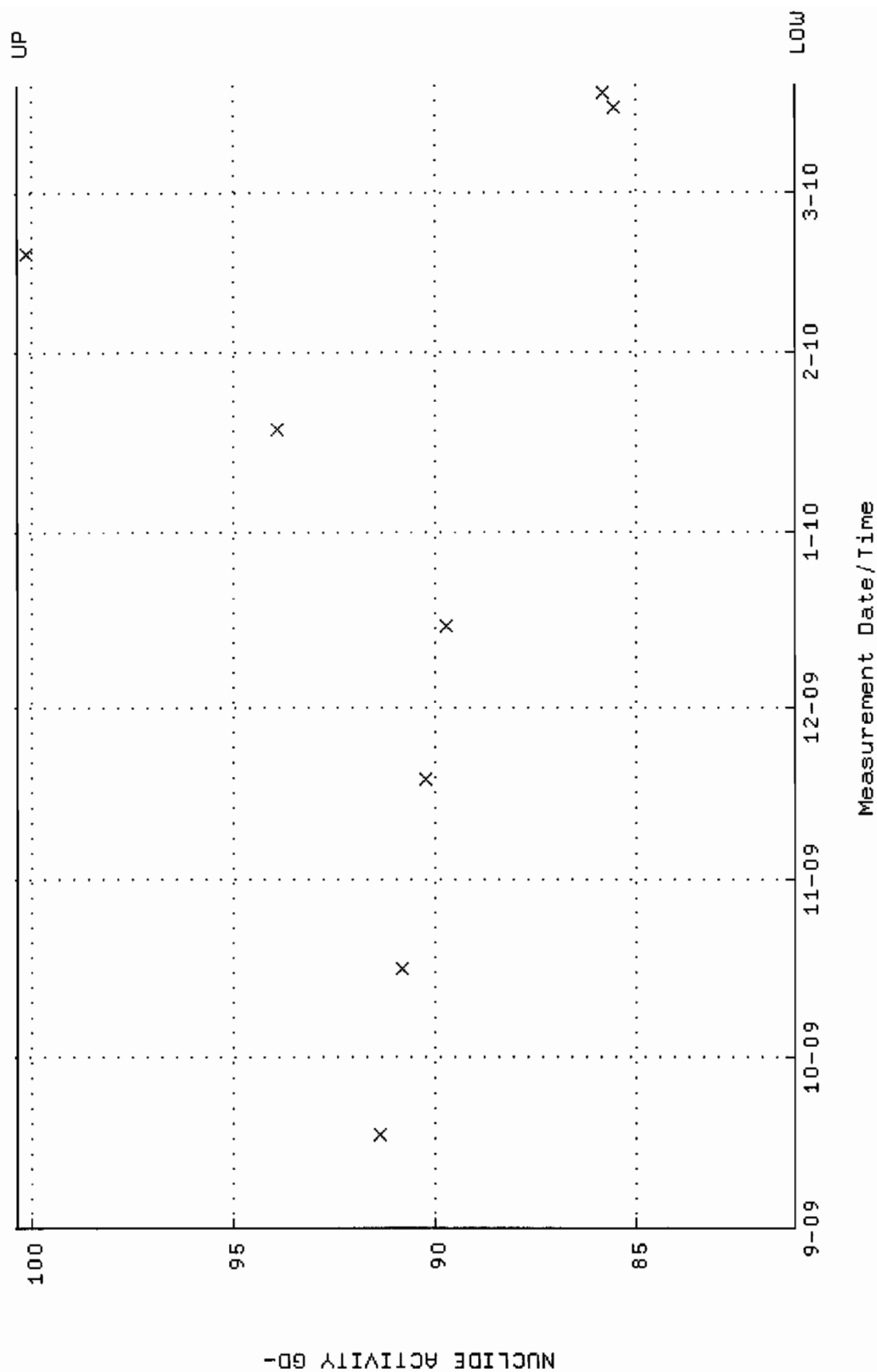
QA filename : DKA100:[ENV\_ALPHA.QA.B]B123.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 15:40:52 through 20-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



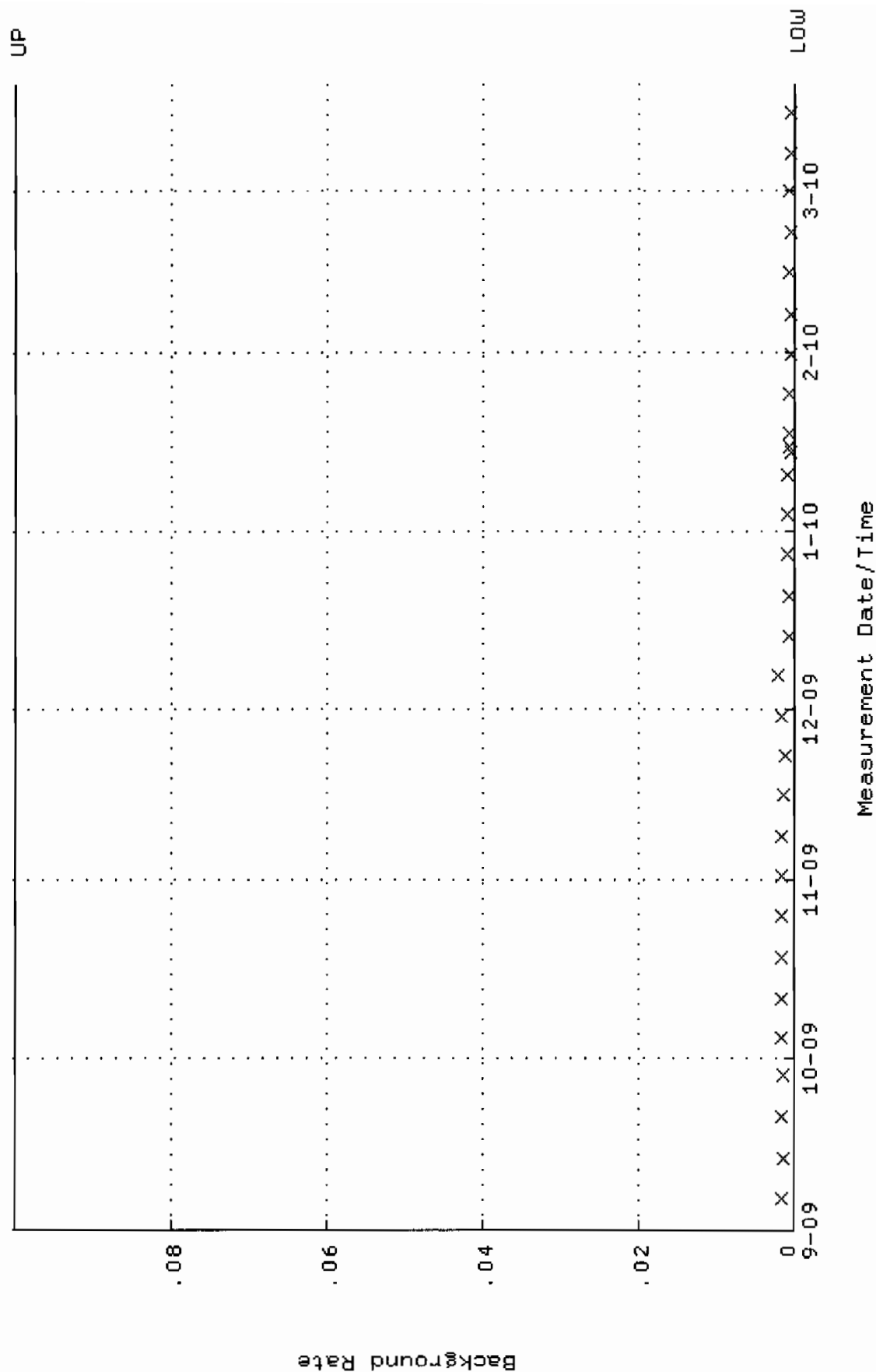
QA filename : DKA100:[ENV\_ALPHA.QA.W]W136.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 17-SEP-2009 07:24:58 through 19-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.220355 through 0.278559



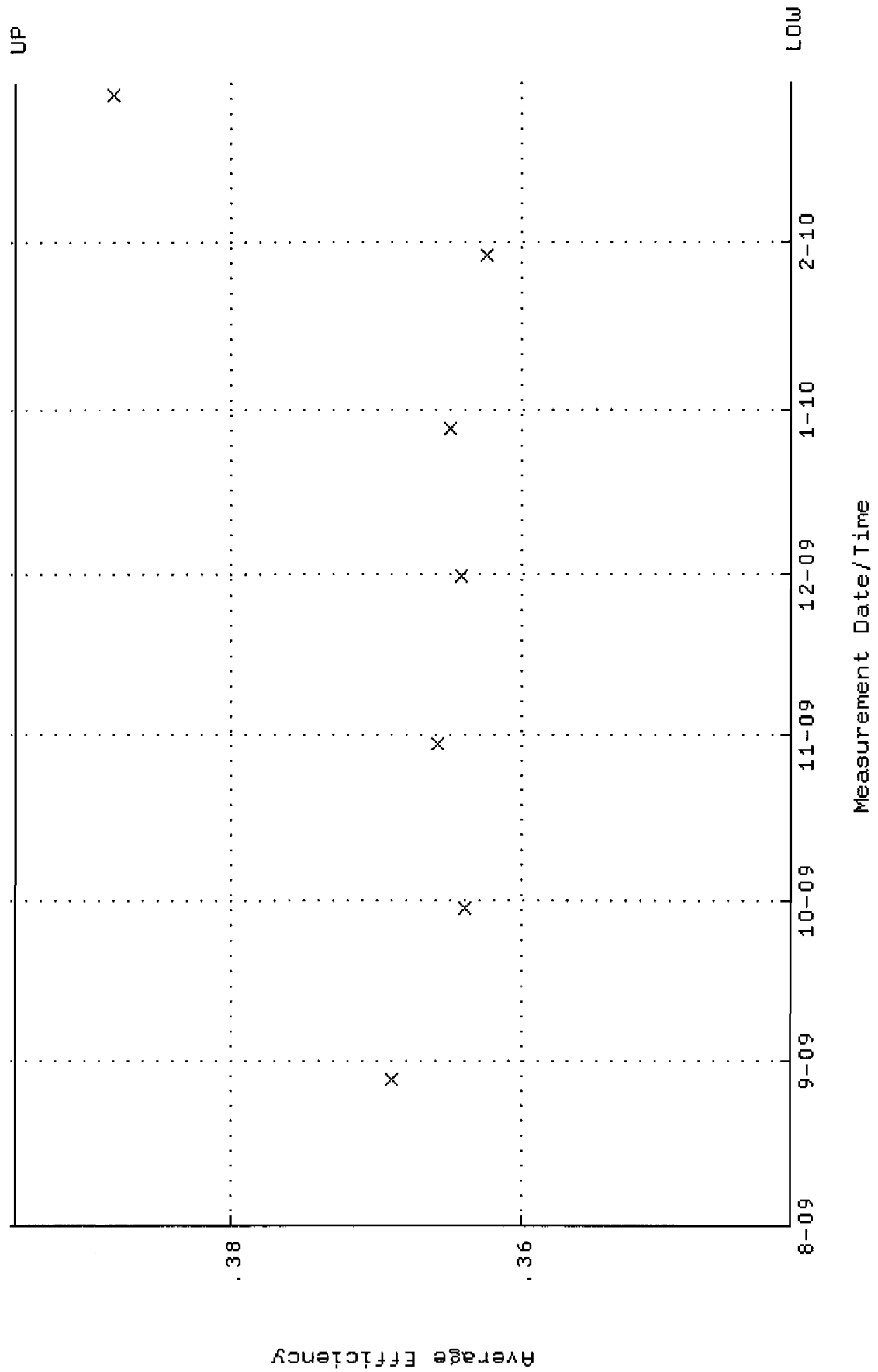
QA filename : DKA100:[ENV\_ALPHA.QA.W]W136.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 17-SEP-2009 07:24:58 through 19-MAR-2010 12:00:00  
 Lower/Upper Lmts: 81.0690 through 100.381



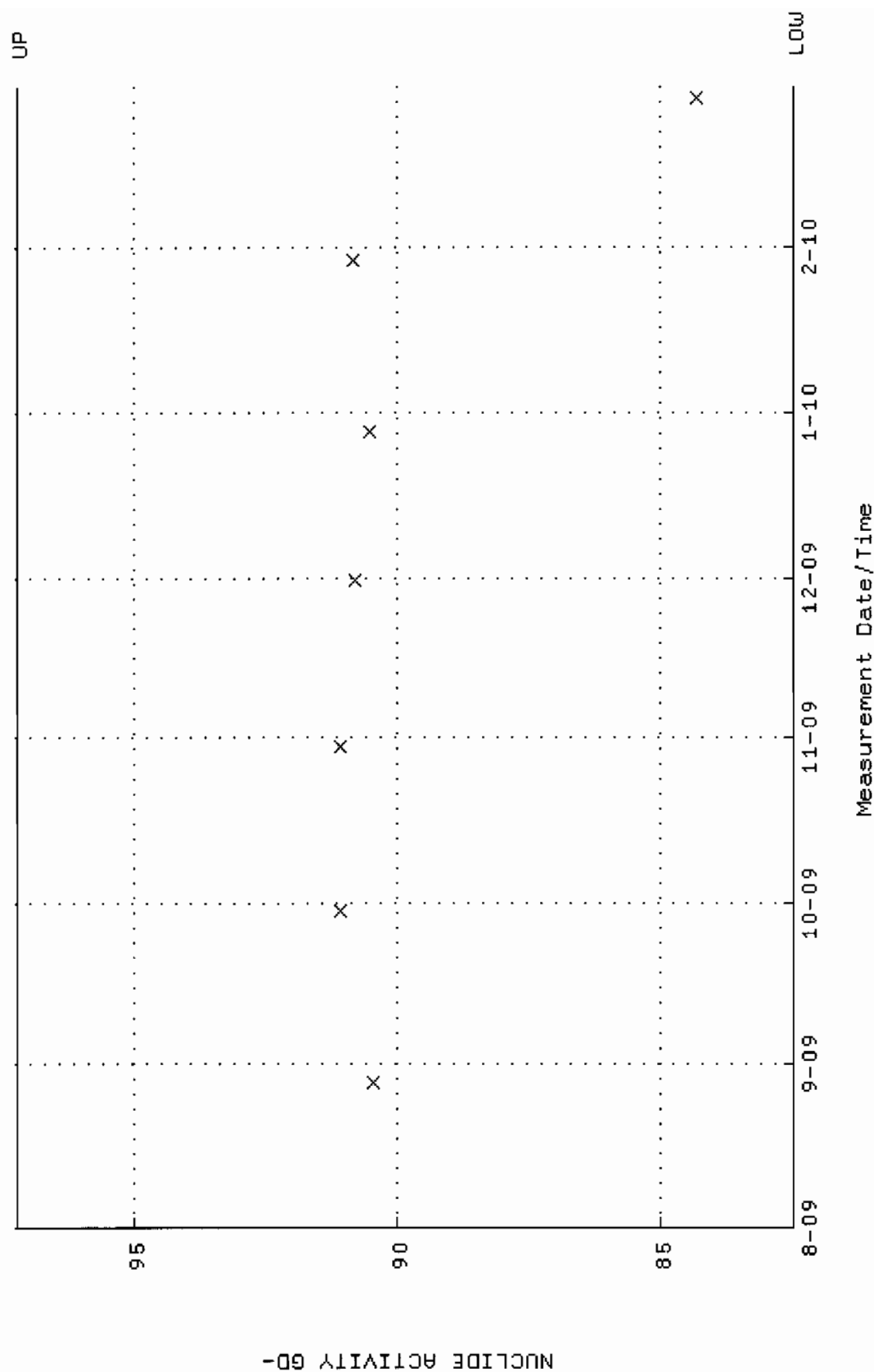
QA filename : DKA100:[ENV\_ALPHA.QA.B]B136.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 6-SEP-2009 15:41:49 through 19-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



QA filename : DKA100:[ENV\_ALPHA.QA.W]W209.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 28-AUG-2009 07:06:29 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.341431 through 0.395023



QA filename : DKA100:[ENV\_ALPHA.QA.W]W209.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 28-AUG-2009 07:06:29 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 82.4748 through 97.2344



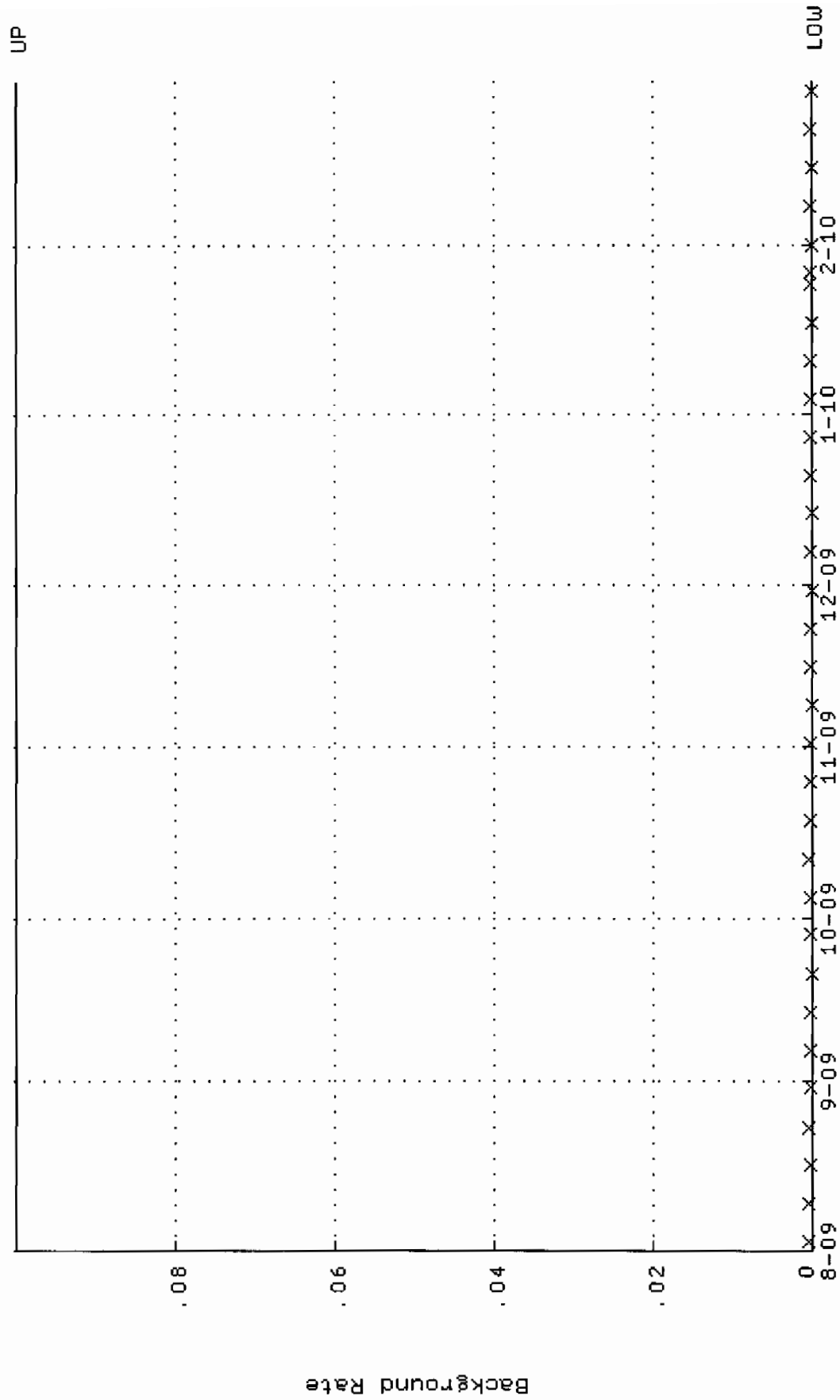


QA filename : DKA100:[ENV\_ALPHA.QA.B]B209.QAF;1

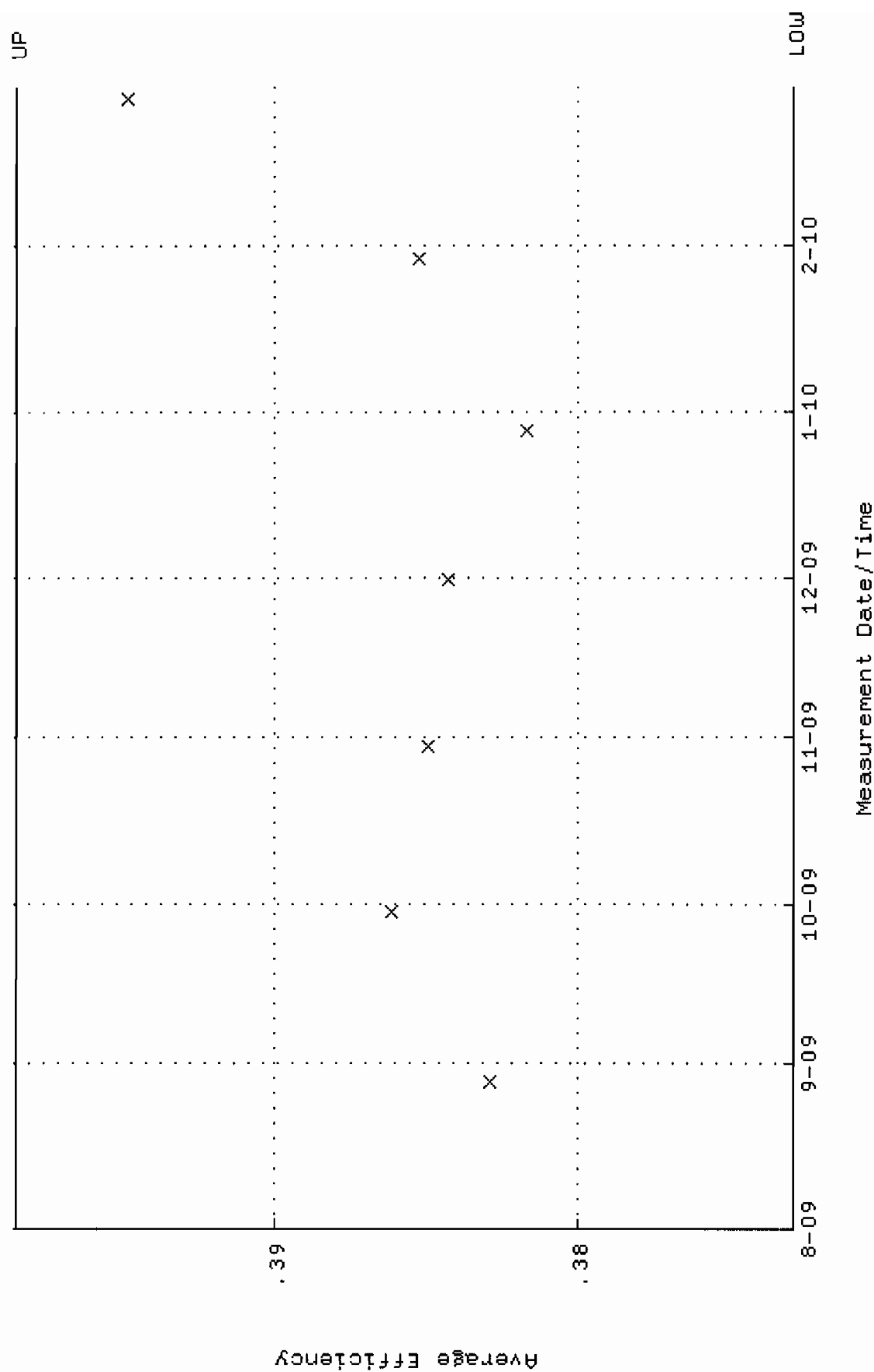
Parameter Name : BACKRATE (Background Rate)

Start/End Dates : 2-AUG-2009 17:25:10 through 2-MAR-2010 12:00:00

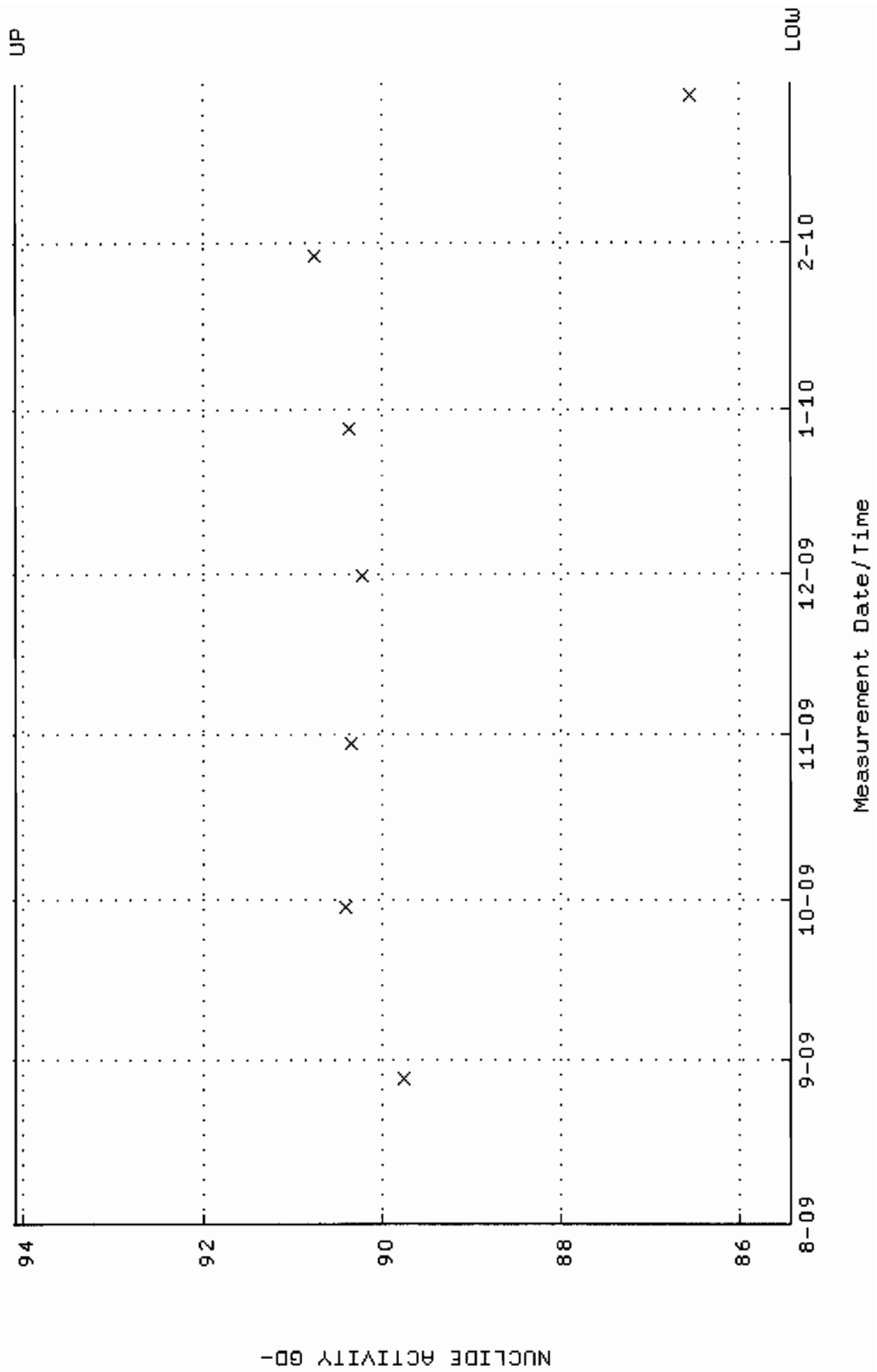
Lower/Upper Lmts: 0.000000E+00 through 0.100000



QA filename : DKA100:[ENV\_ALPHA.QA.W]W210.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 28-AUG-2009 07:06:35 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.372938 through 0.398472



QA filename : DKA100:[ENV\_ALPHA.QA.W]W210.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 28-AUG-2009 07:06:35 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 85.4367 through 94.0881

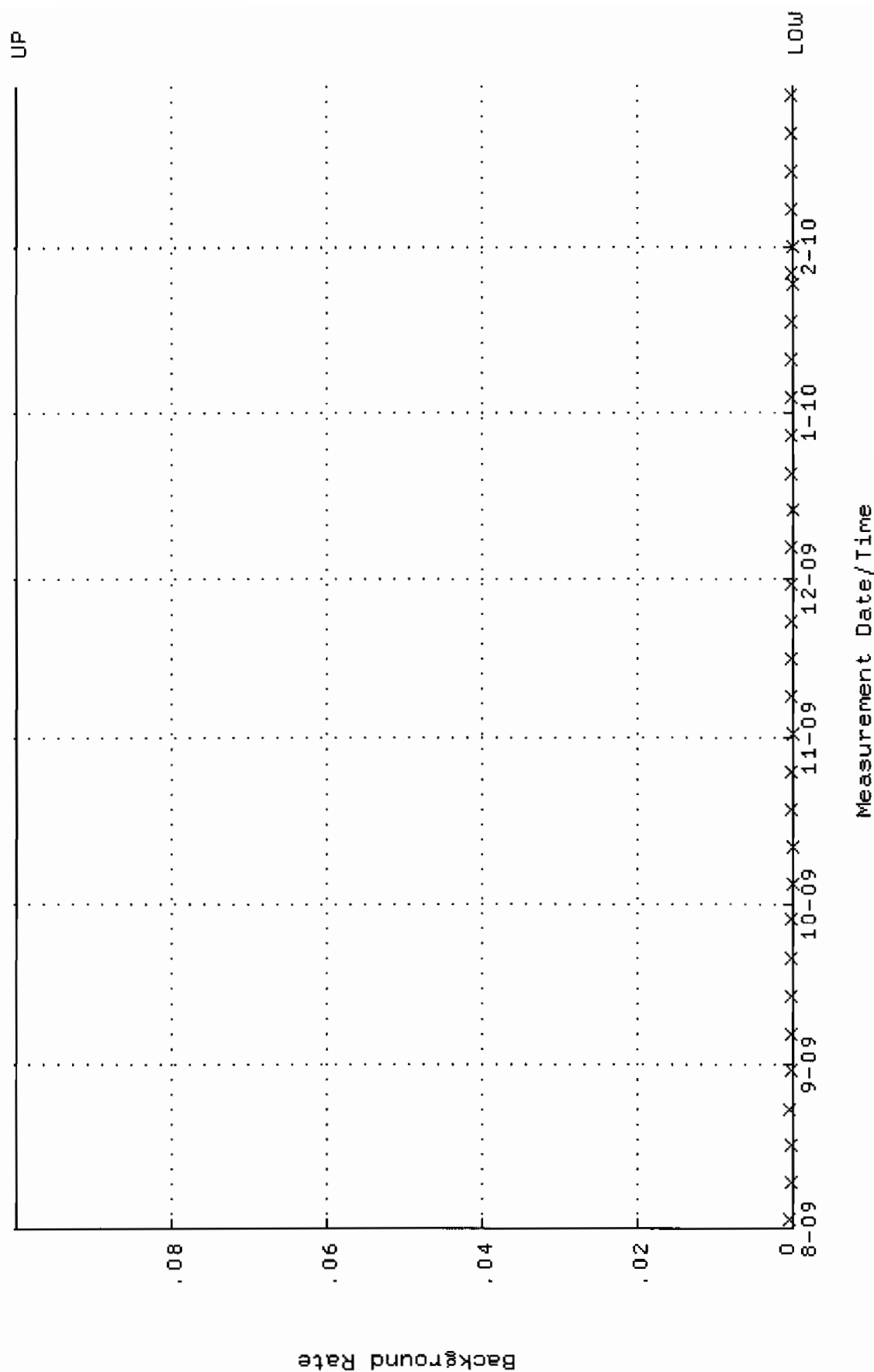


QA filename : DKA100:[ENV\_ALPHA.QA.B]B210.QAF;1

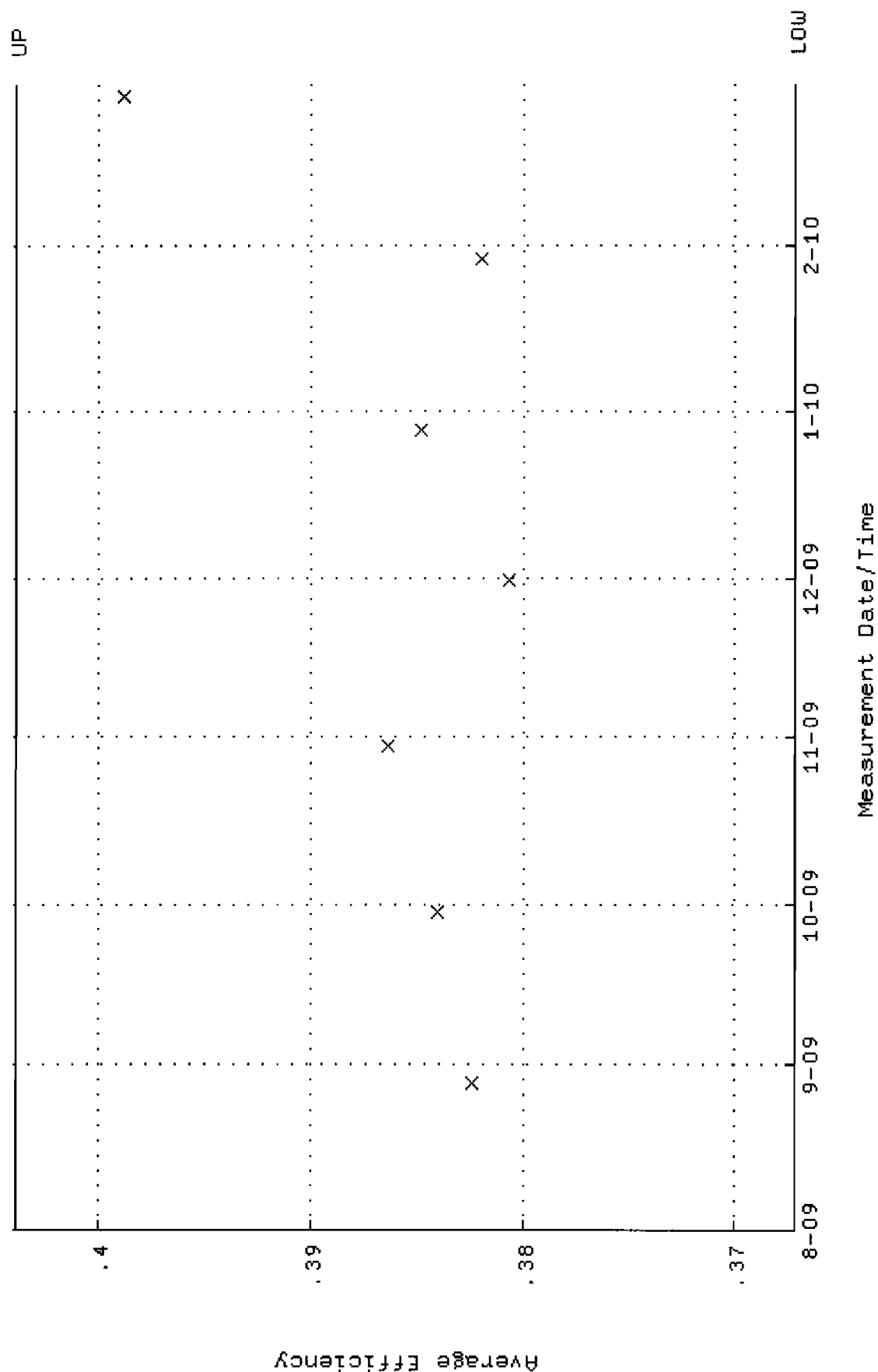
Parameter Name : BACKRATE (Background Rate)

Start/End Dates : 2-AUG-2009 17:25:14 through 2-MAR-2010 12:00:00

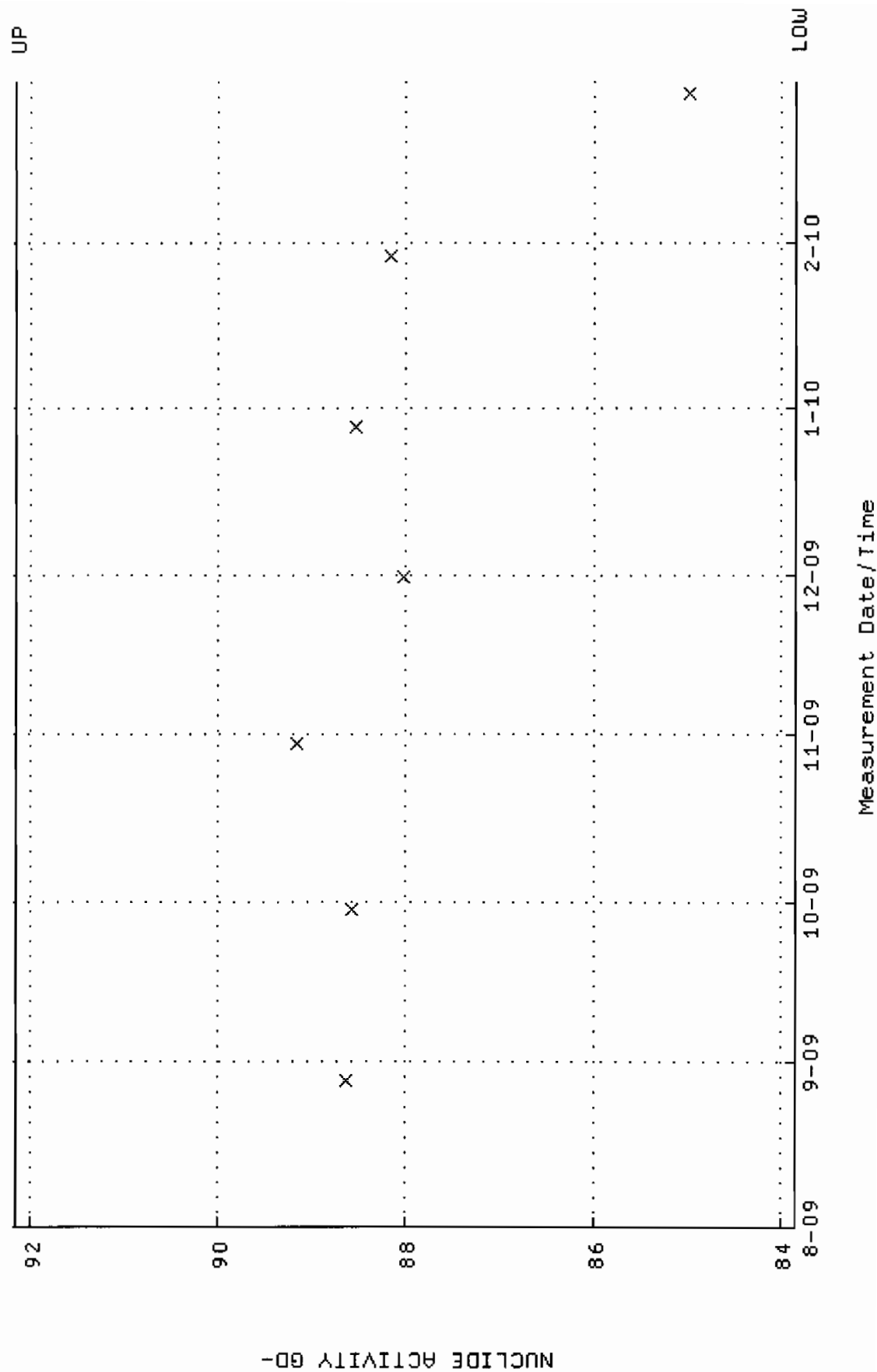
Lower/Upper Lmts: 0.000000E+00 through 0.100000



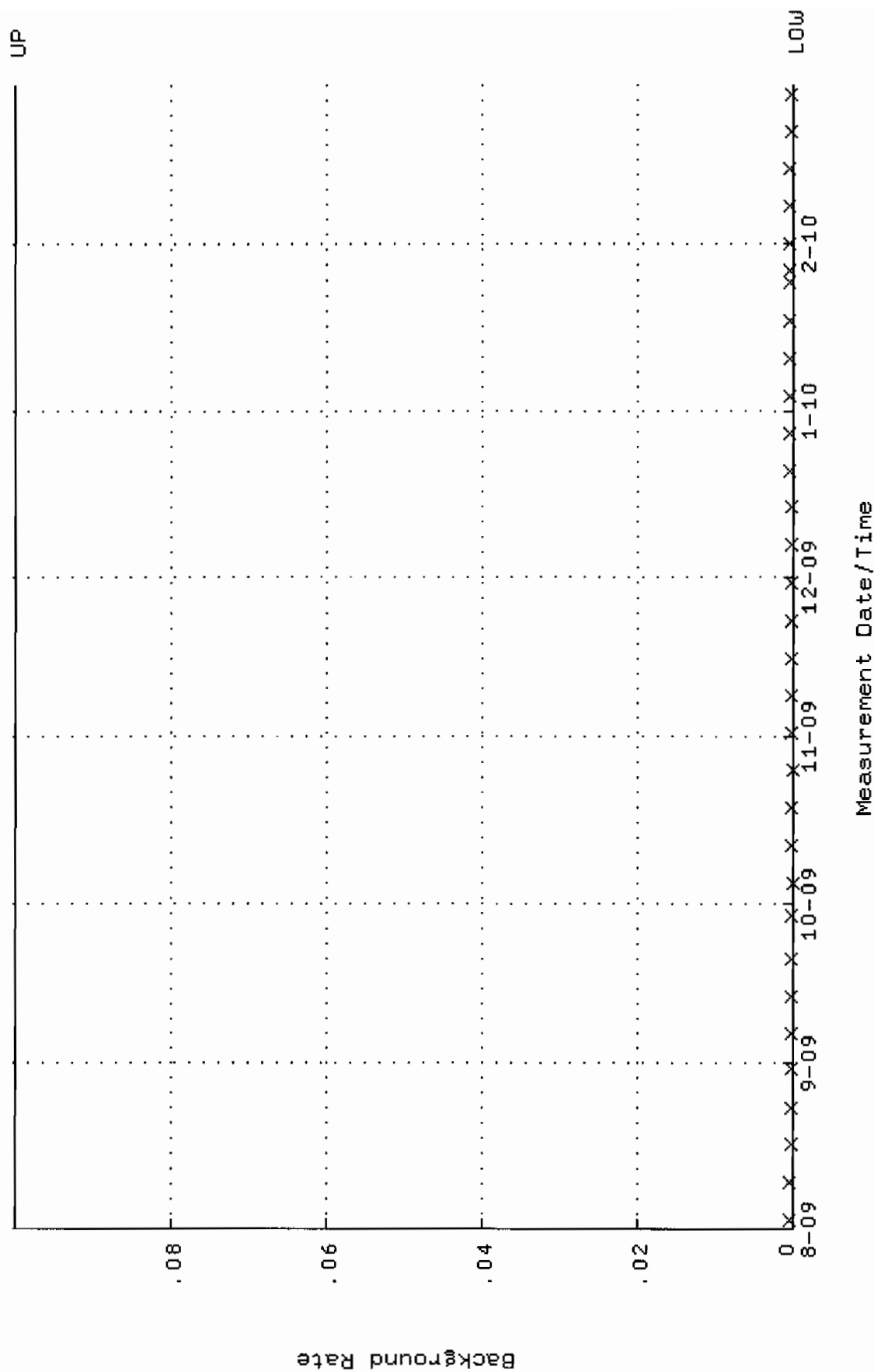
QA filename : DKA100:[ENV\_ALPHA.QA.W]W211.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 28-AUG-2009 07:06:39 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.367181 through 0.403915



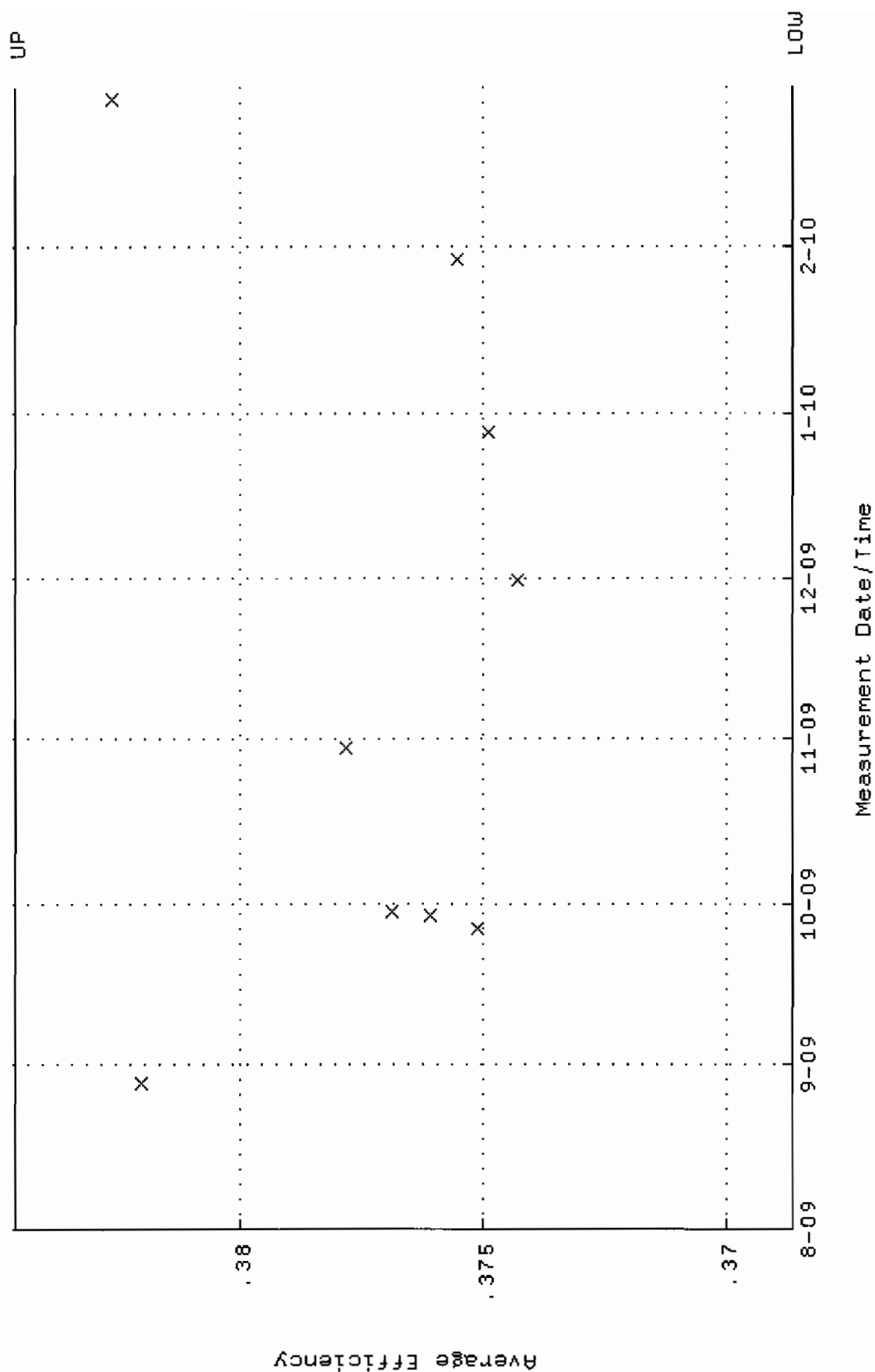
QA filename : DKA100:[ENV\_ALPHA.QA.W]W211.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 28-AUG-2009 07:06:39 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 83.8443 through 92.1557



QA filename : DKA100:[ENV\_ALPHA.QA.B]B211.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-AUG-2009 17:25:19 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000

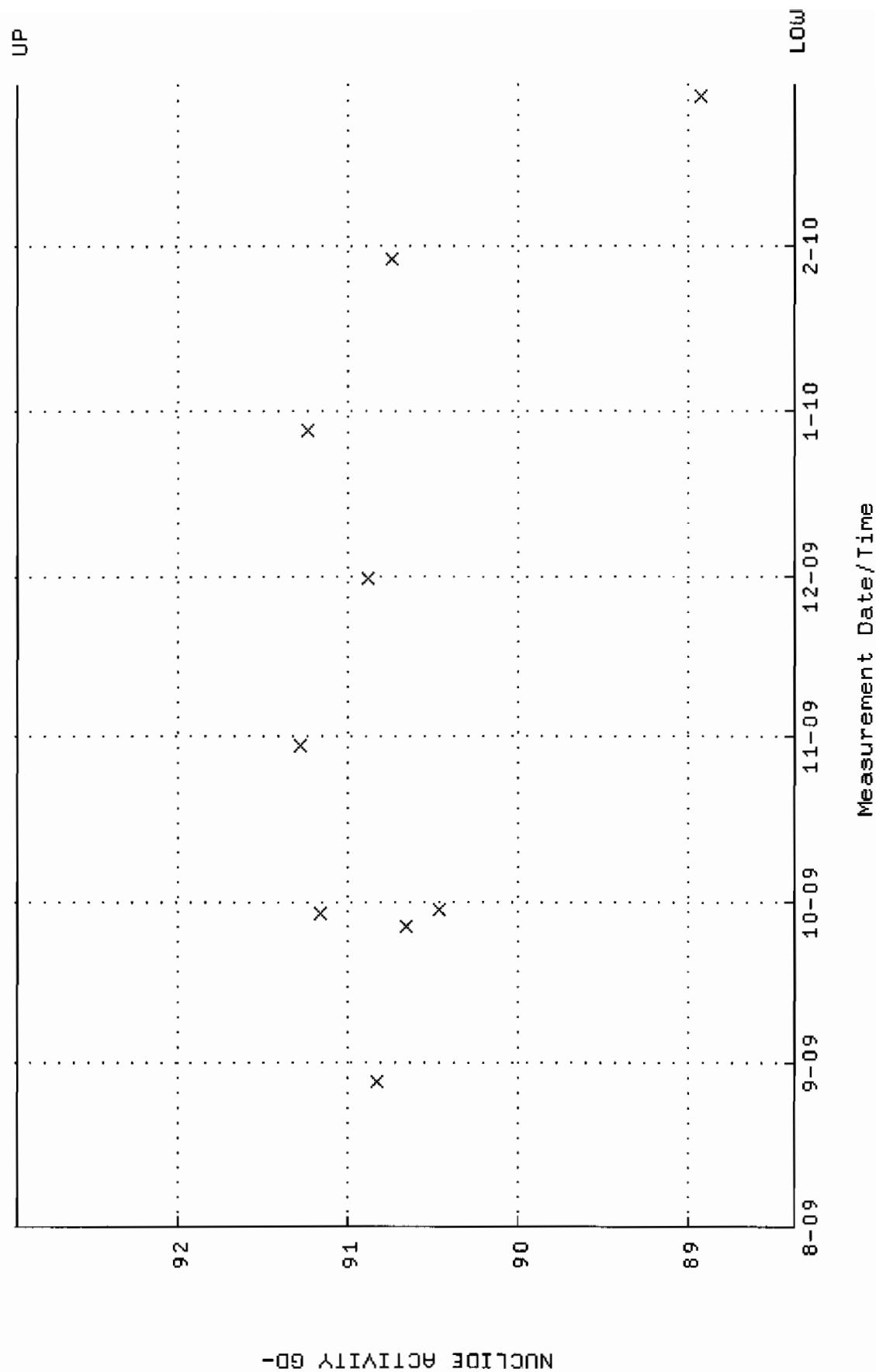


QA filename : DKA100:[ENV\_ALPHA.QA.W]W215.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 28-AUG-2009 07:06:59 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.368657 through 0.384643

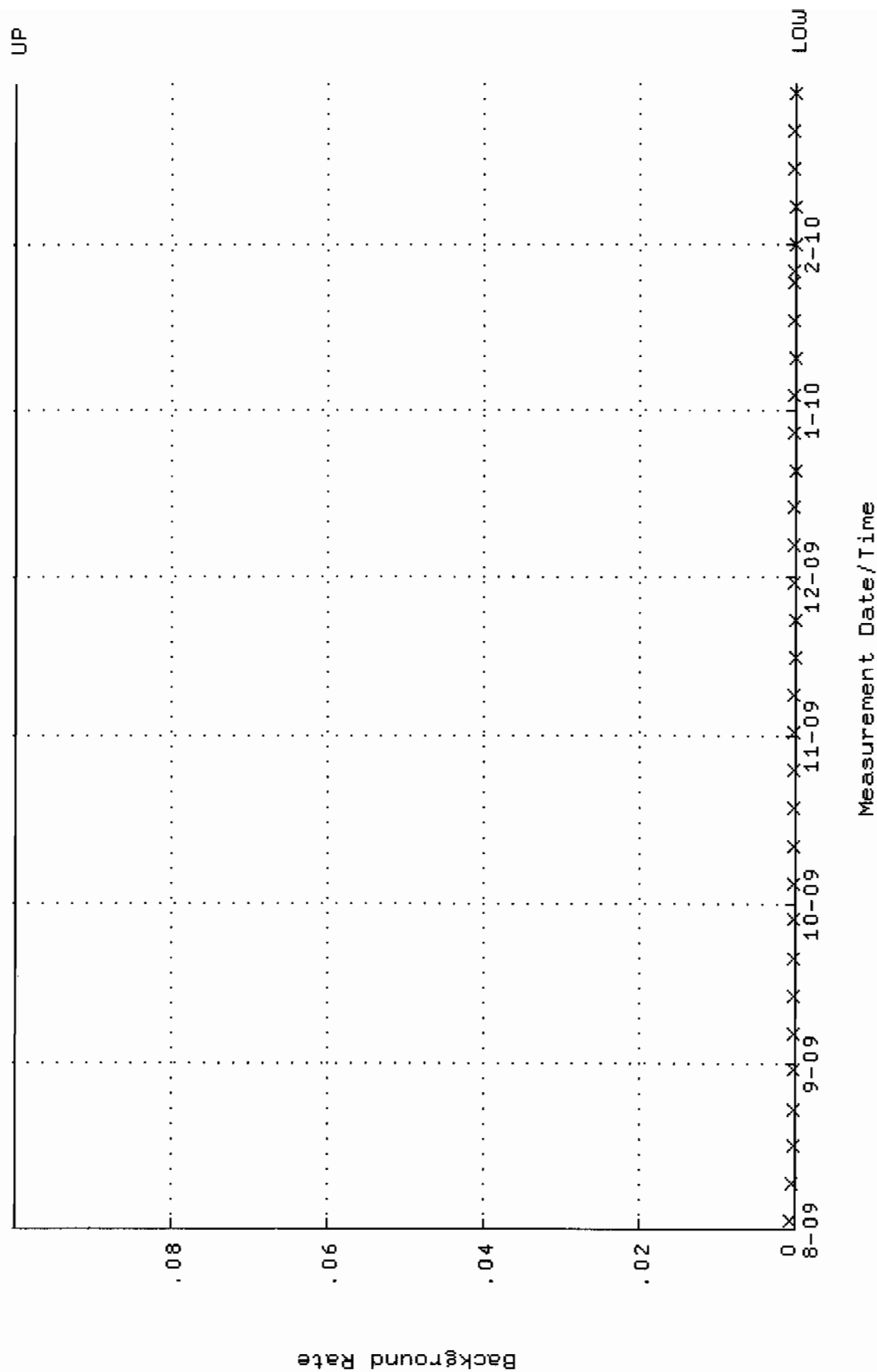




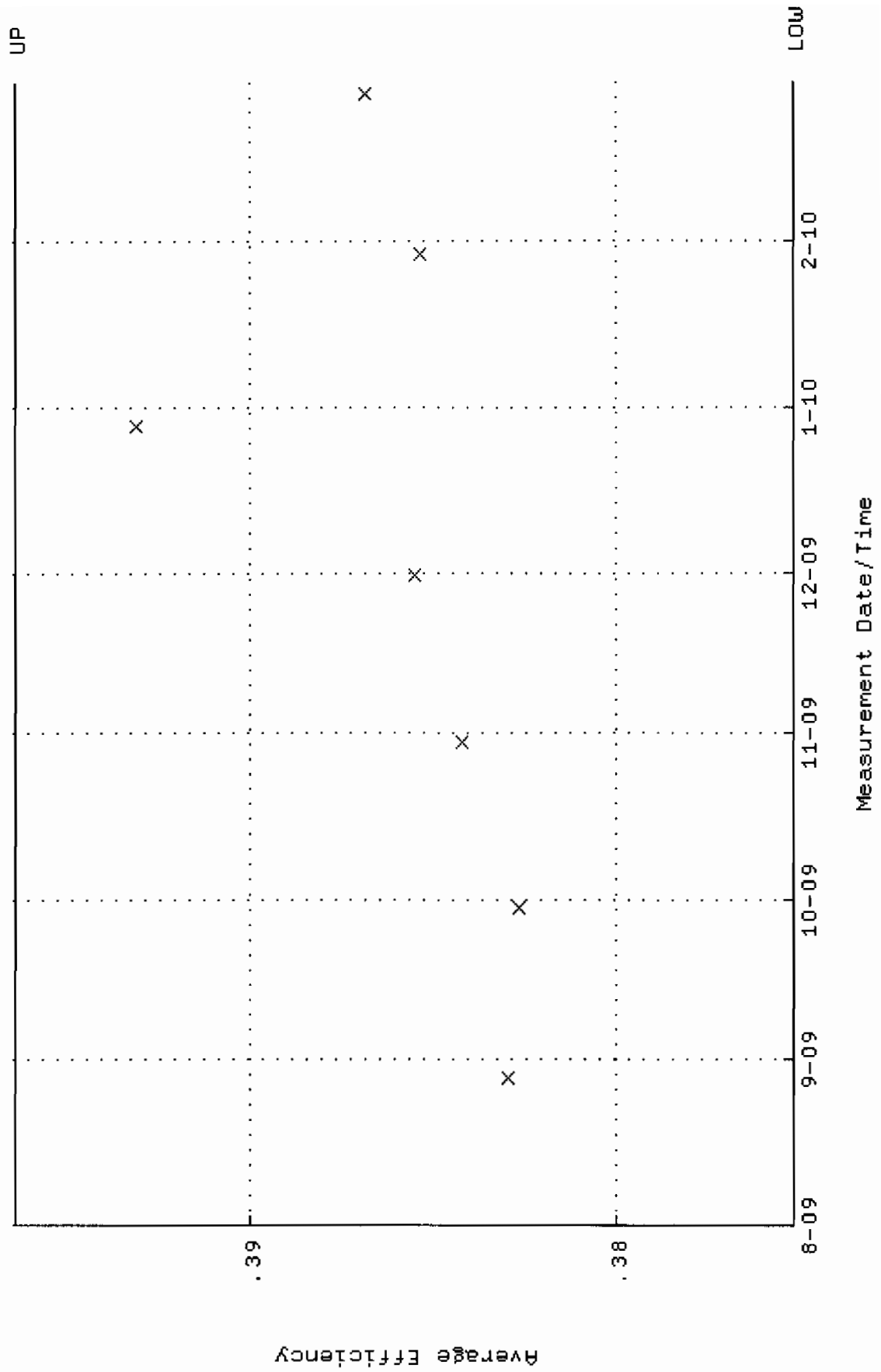
QA filename : DKA100:[ENV\_ALPHA.QA.W]w215.QAF;1  
 Parameter Name : NLAIVITY-GO148 (NUCLIDE ACTIVITY GO-148)  
 Start/End Dates : 28-AUG-2009 07:06:59 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 88.3773 through 92.9481



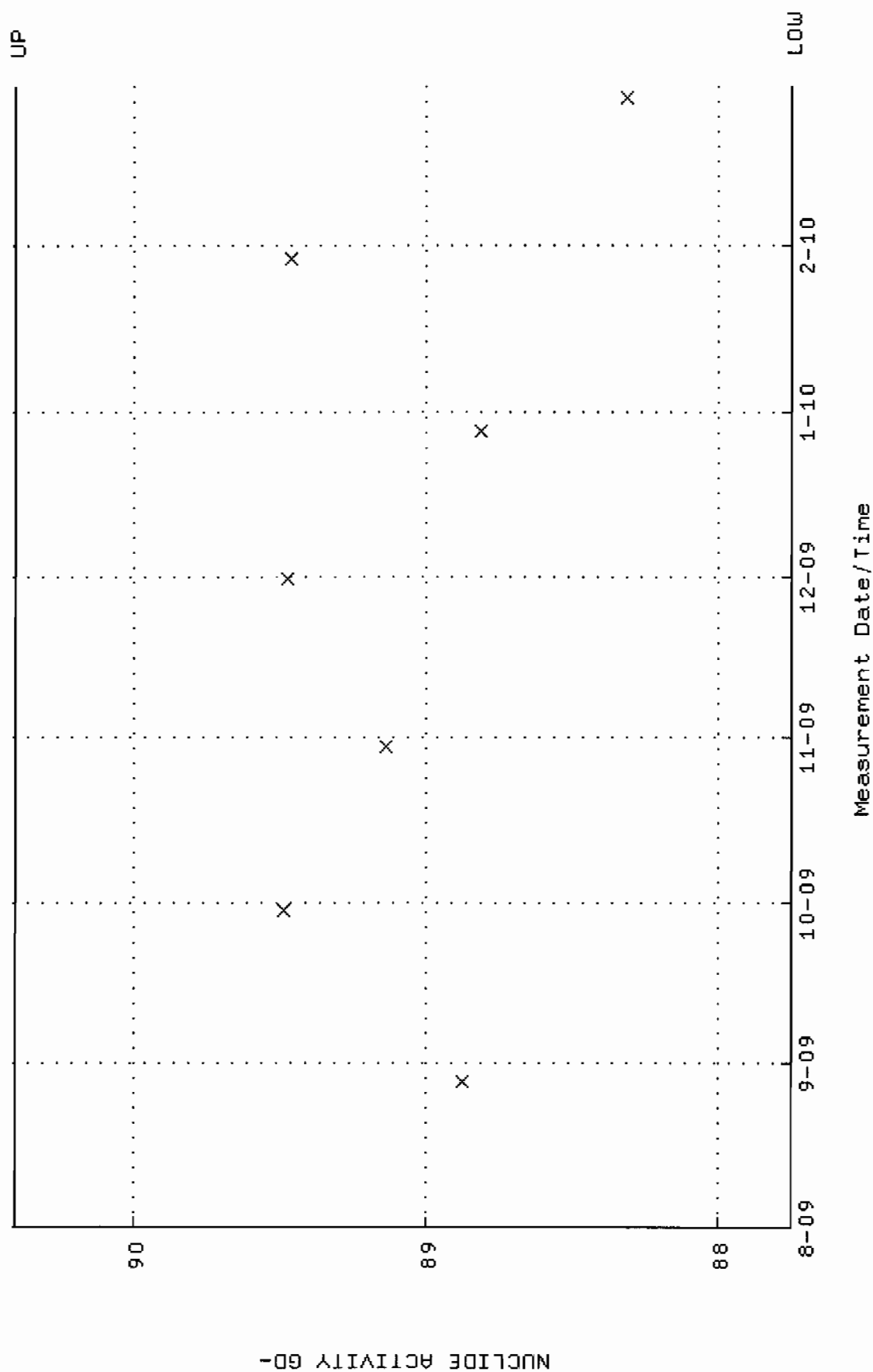
QA filename : DKA100:[ENV\_ALPHA.QA.B]B215.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-AUG-2009 17:25:35 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



QA filename : DKA100:[ENV\_ALPHA.QA.W]W216.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 28-AUG-2009 07:07:04 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.375142 through 0.396434



QA filename : DKA100:[ENV\_ALPHA.QA.W]W216.QAF;1  
 Parameter Name : NLACTVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 28-AUG-2009 07:07:04 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 87.7466 through 90.4082

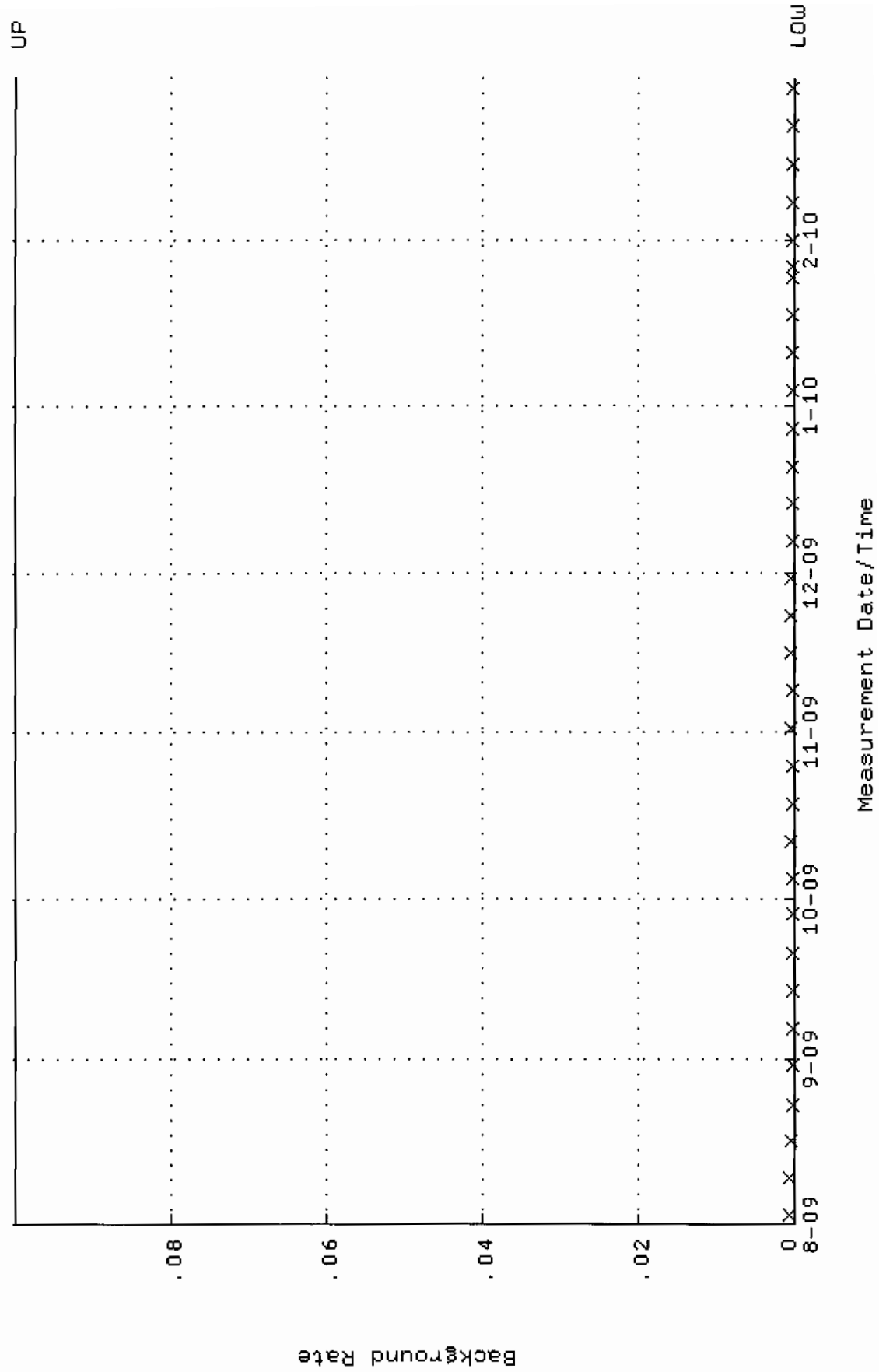


QA filename : DKA100:[ENV\_ALPHA.QA.B]B216.QAF;1

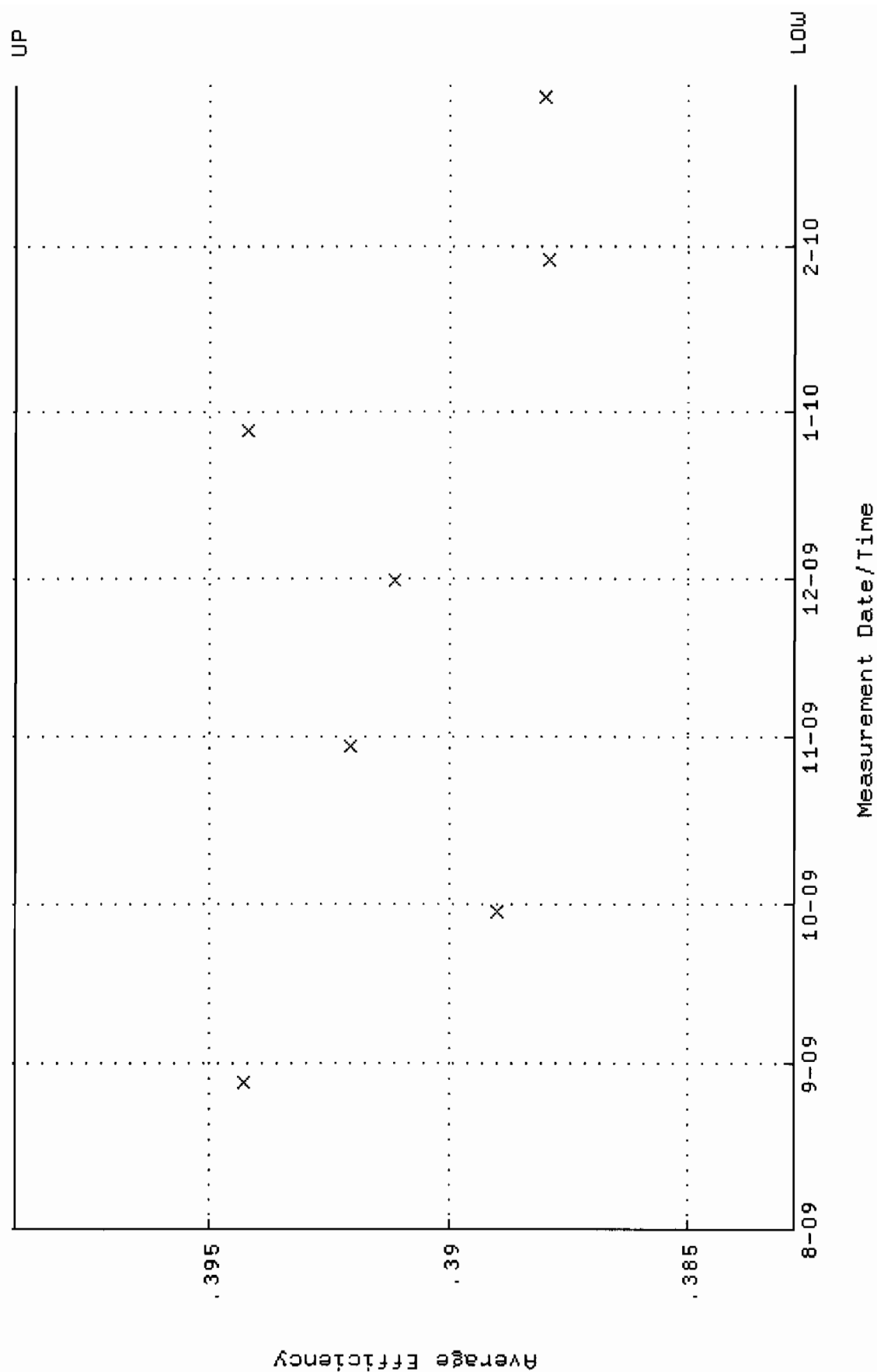
Parameter Name : BACKRATE (Background Rate)

Start/End Dates : 2-AUG-2009 17:25:40 through 2-MAR-2010 12:00:00

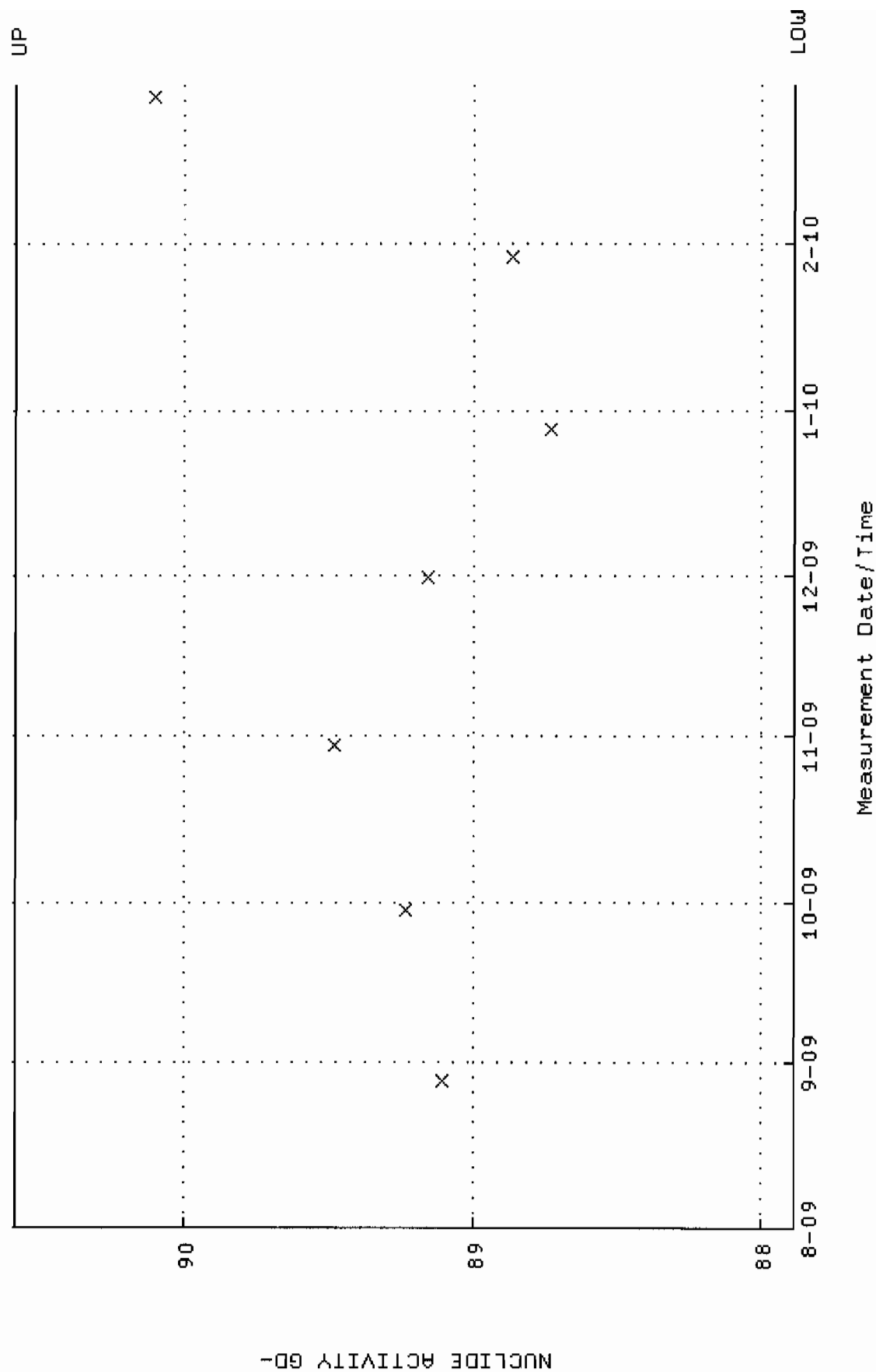
Lower/Upper Lmts: 0.000000E+00 through 0.100000



QA filename : DKA100:[ENV\_ALPHA.QA.W]W225.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 28-AUG-2009 07:07:50 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.382792 through 0.399070



QA filename : DKA100:[ENV\_ALPHA.QA.W]W225.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 28-AUG-2009 07:07:50 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 87.8853 through 90.5875

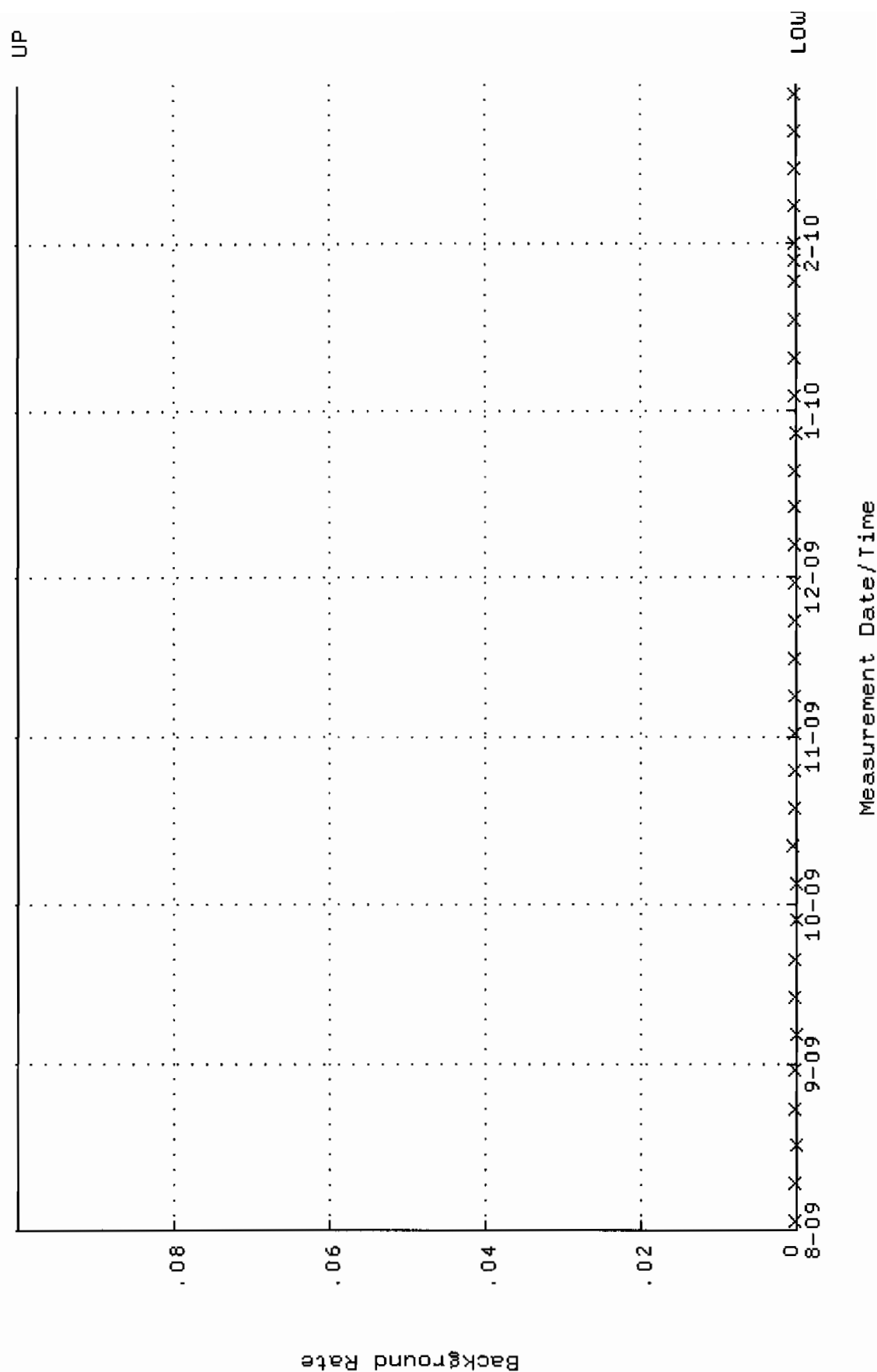


QA filename : DKA100:[ENV\_ALPHA.QA.B]B225.QAF;1

Parameter Name : BACKRATE (Background Rate)

Start/End Dates : 2-AUG-2009 17:26:16 through 2-MAR-2010 12:00:00

Lower/Upper Lmts: 0.000000E+00 through 0.100000



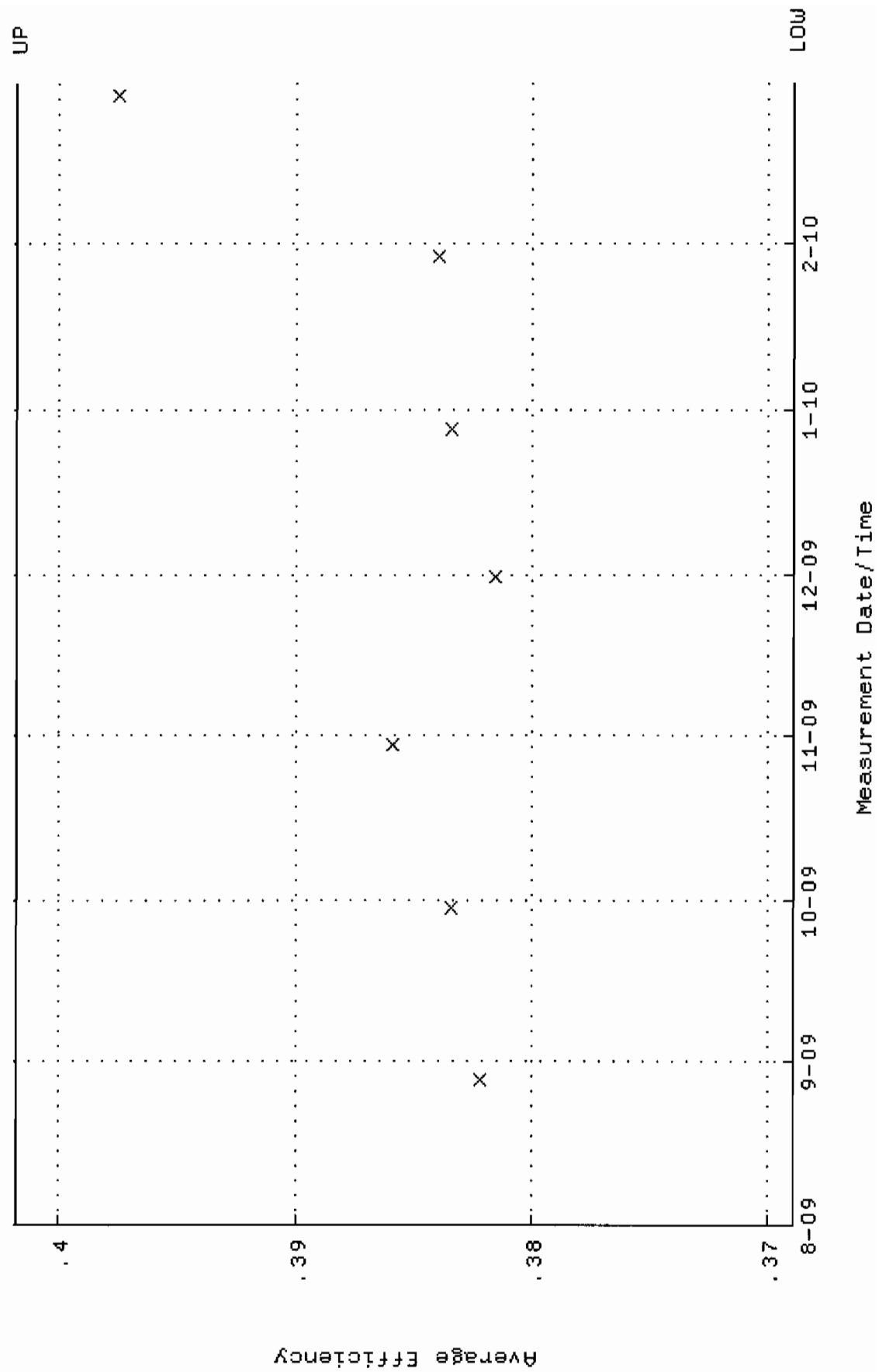


QA filename : DKA100:[ENV\_ALPHA.QA.W]W234.QAF;1

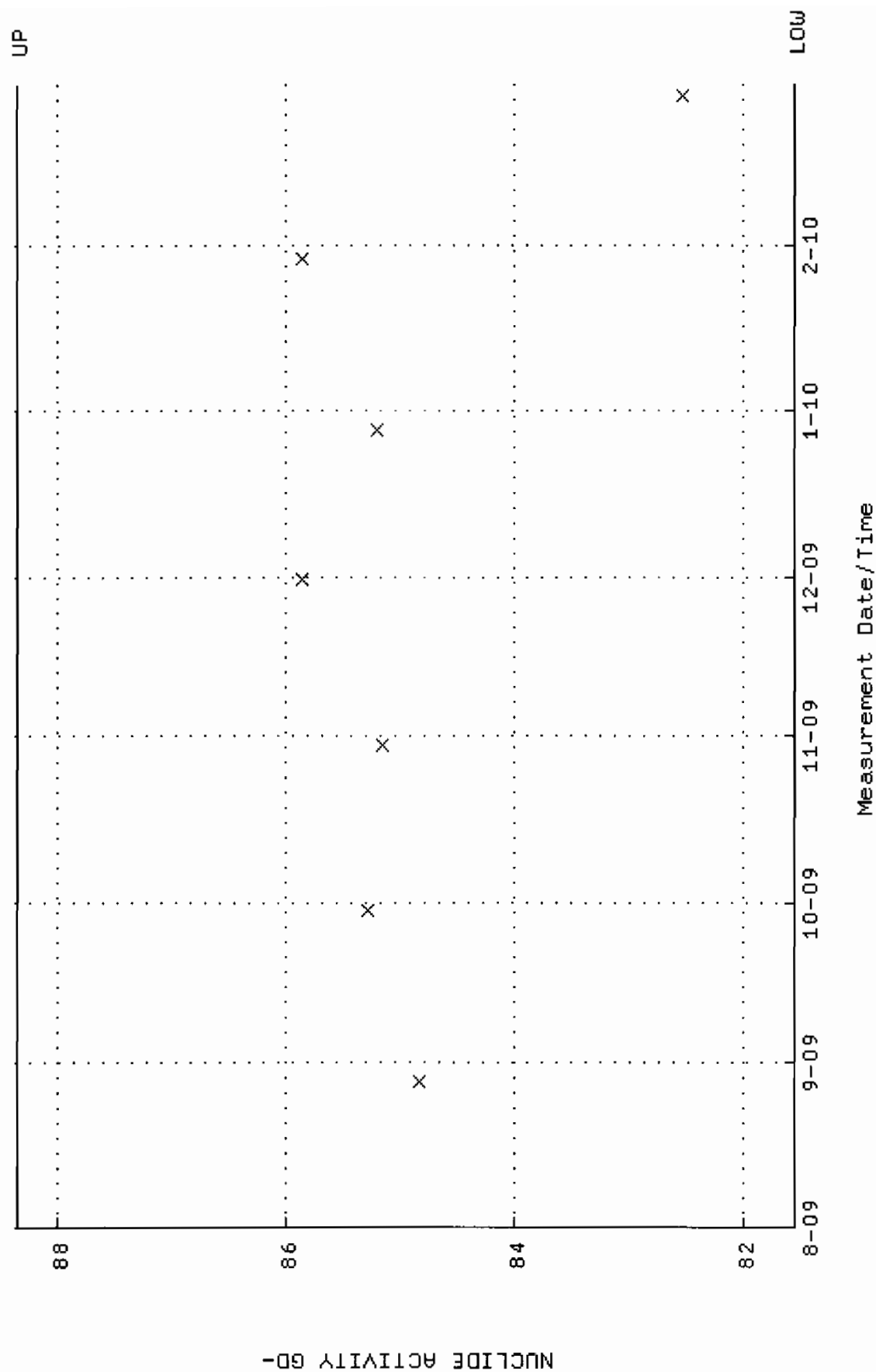
Parameter Name : AVRGEFF (Average Efficiency)

Start/End Dates : 28-AUG-2009 07:08:41 through 2-MAR-2010 12:00:00

Lower/Upper Lmts: 0.368938 through 0.401788



QA filename : DKA100:[ENV\_ALPHA.QA.W]W234.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 28-AUG-2009 07:08:41 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 81.5490 through 88.3592

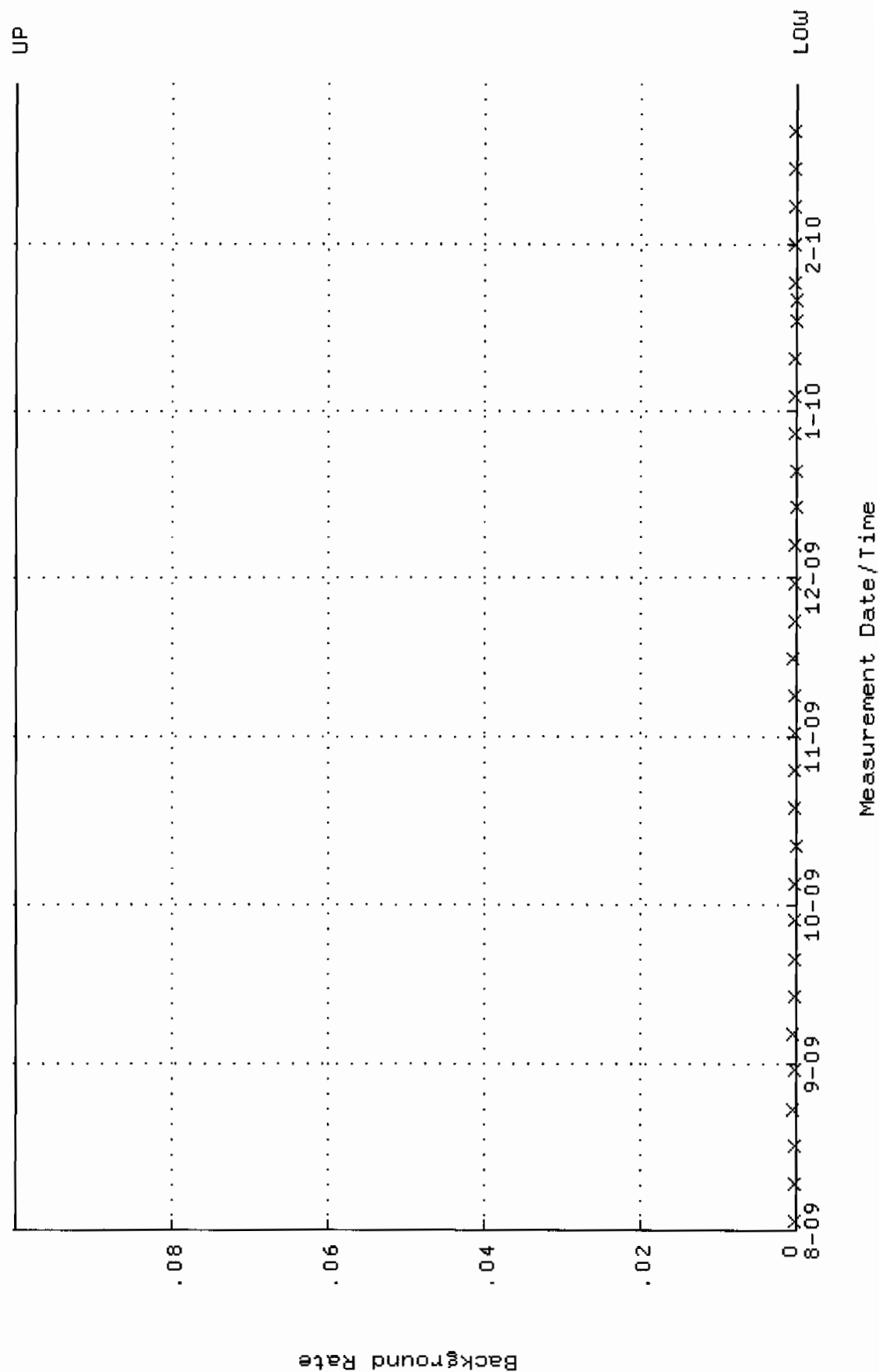


QA filename : DKA100:[ENV\_ALPHA.QA.B]B234.QAF;1

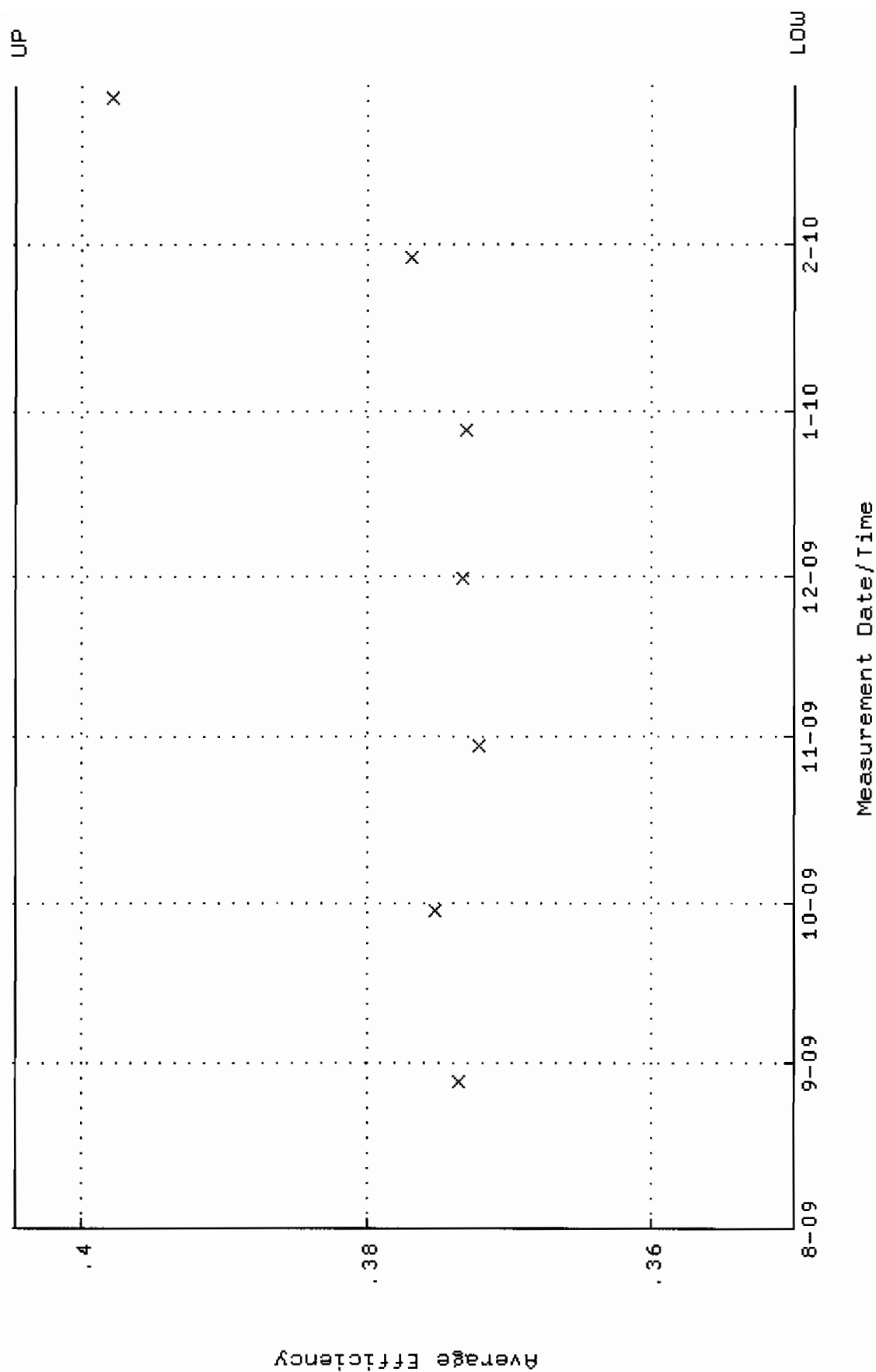
Parameter Name : BACKRATE (Background Rate)

Start/End Dates : 2-AUG-2009 17:26:56 through 2-MAR-2010 12:00:00

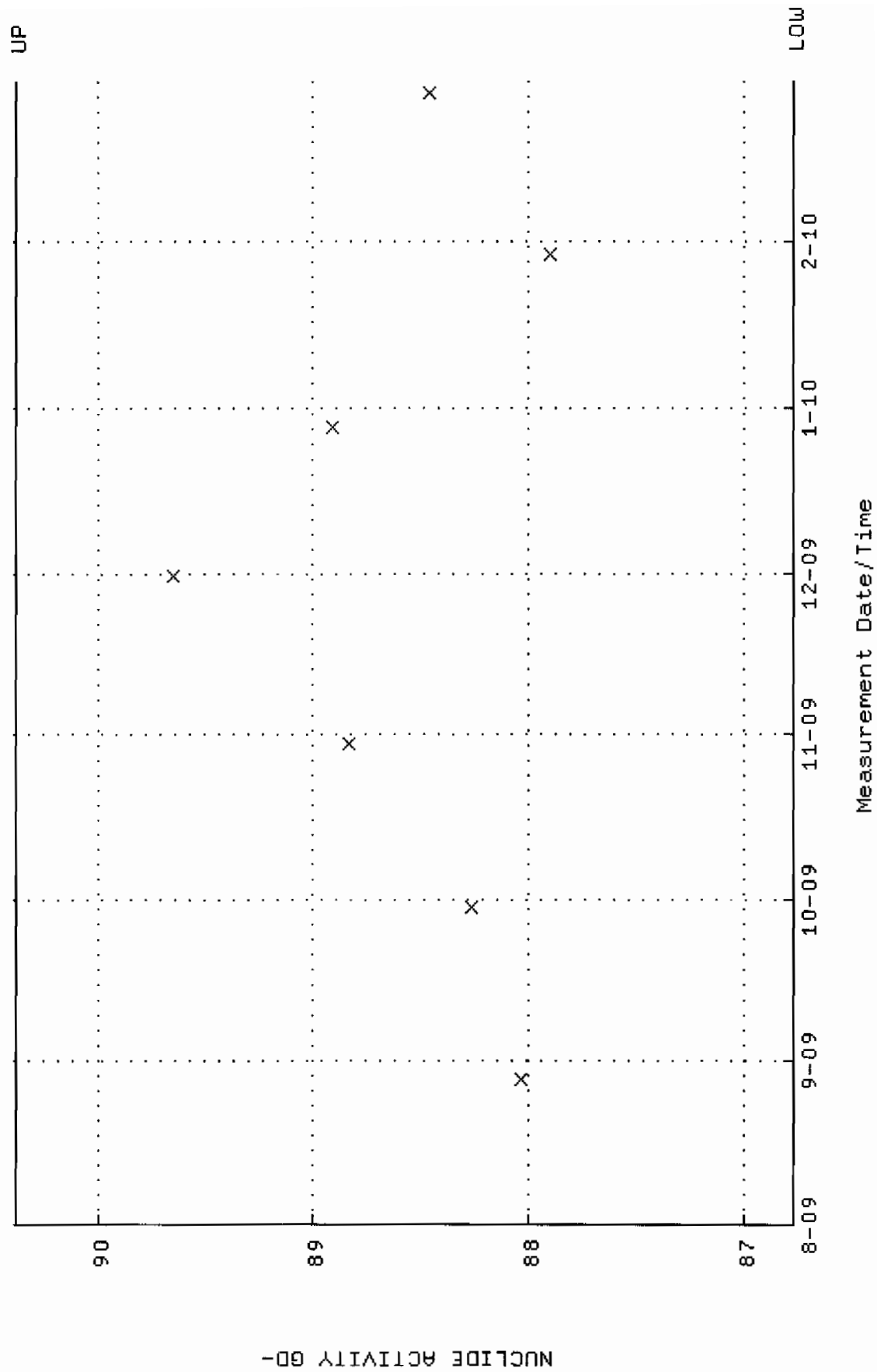
Lower/Upper Lmts: 0.000000E+00 through 0.100000



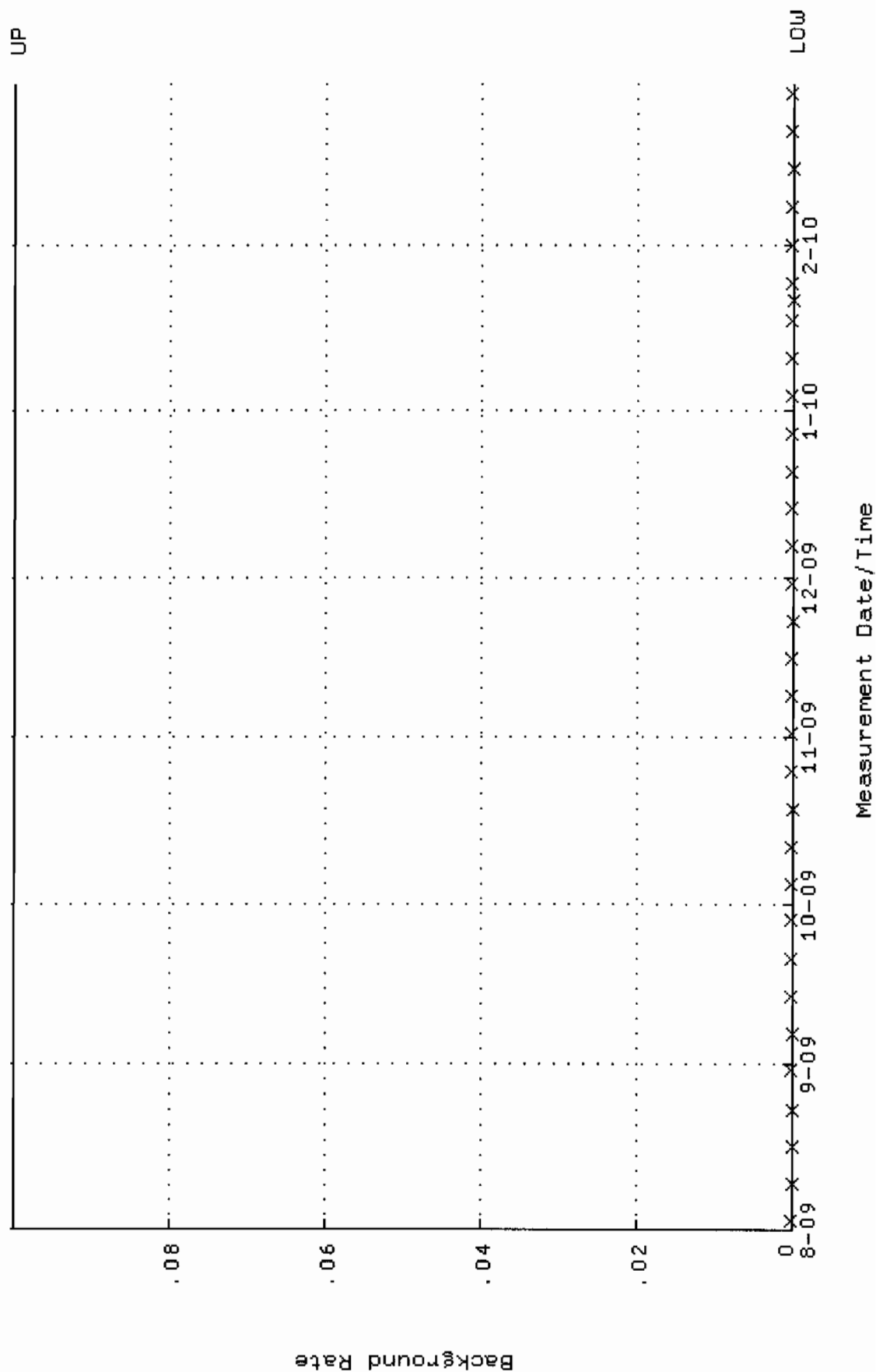
QA filename : DKA100:[ENV\_ALPHA.QA.W]U235.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 28-AUG-2009 07:08:45 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.350020 through 0.404668



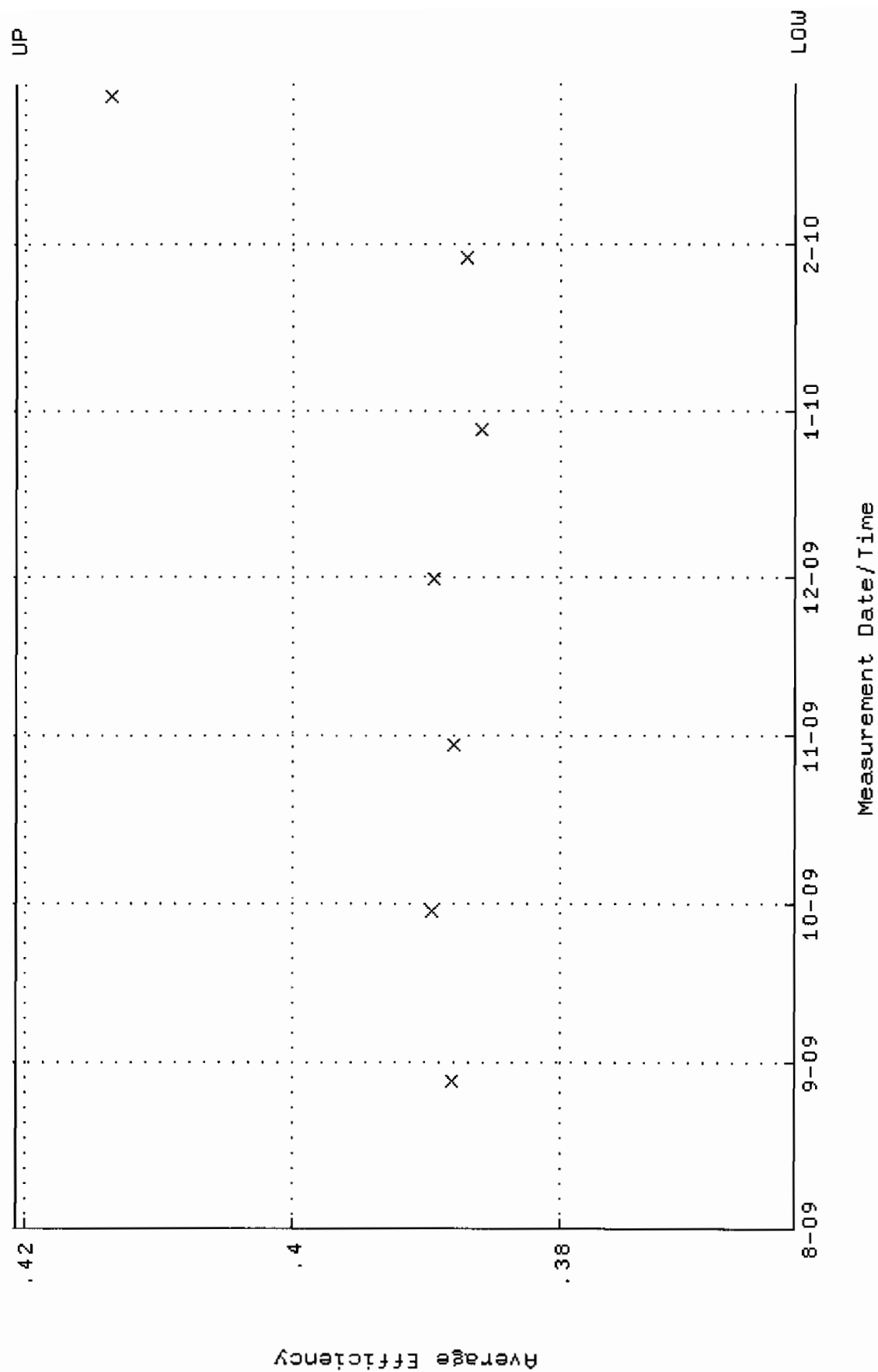
QA filename : DKA100:[ENV\_ALPHA.QA.W]W235.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 28-AUG-2009 07:08:45 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 86.7703 through 90.3803



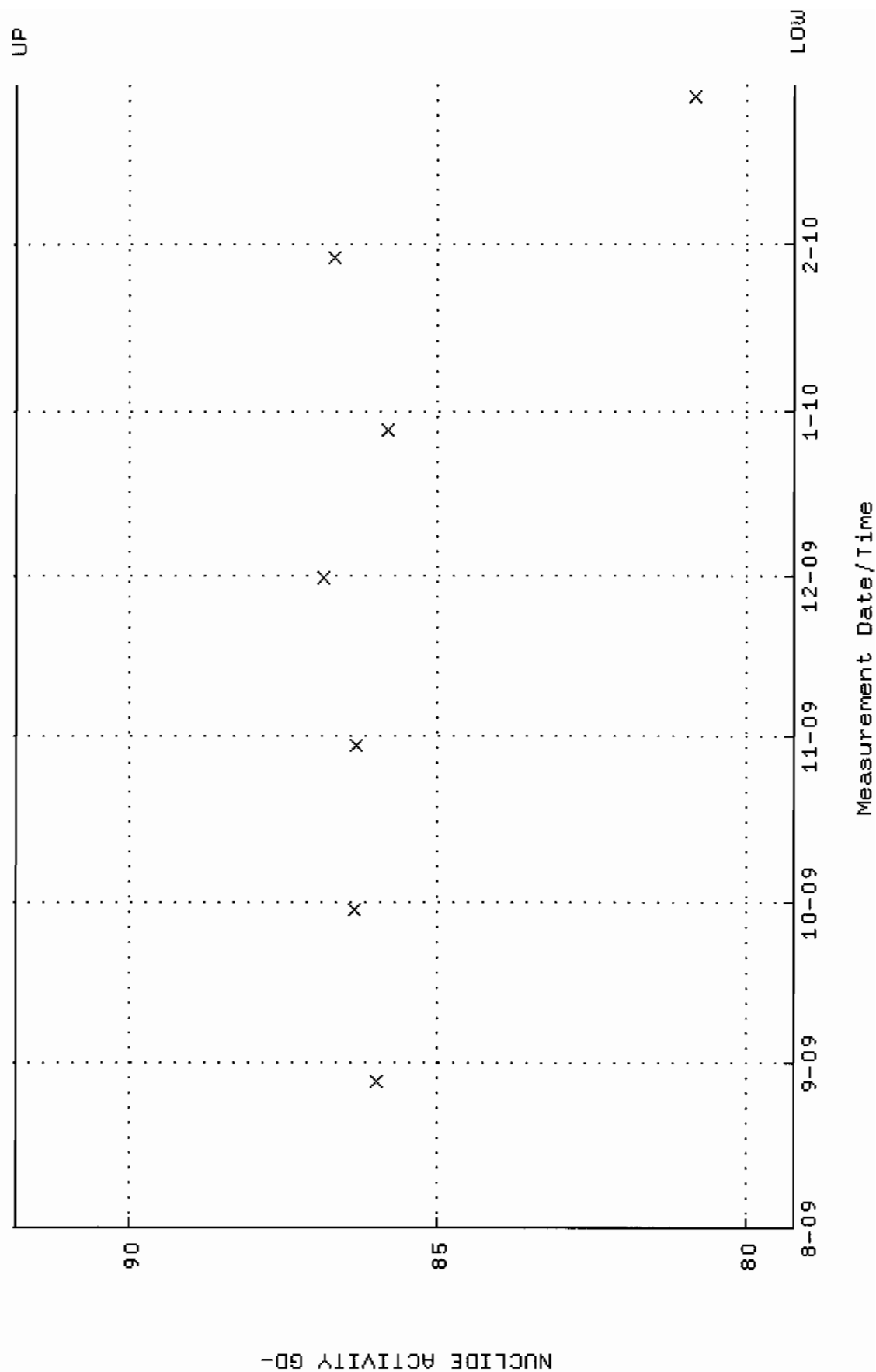
QA filename : DKA100:[ENV\_ALPHA.QA.B]8235.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-AUG-2009 17:27:00 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



QA filename : DKA100:[ENV\_ALPHA.QA.W]W236.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 28-AUG-2009 07:08:51 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 0.362418 through 0.420706



QA filename : DKA100:[ENV\_ALPHA.QA.W]W236.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 28-AUG-2009 07:08:51 through 2-MAR-2010 12:00:00  
 Lower/Upper Lmts: 79.2135 through 91.8401



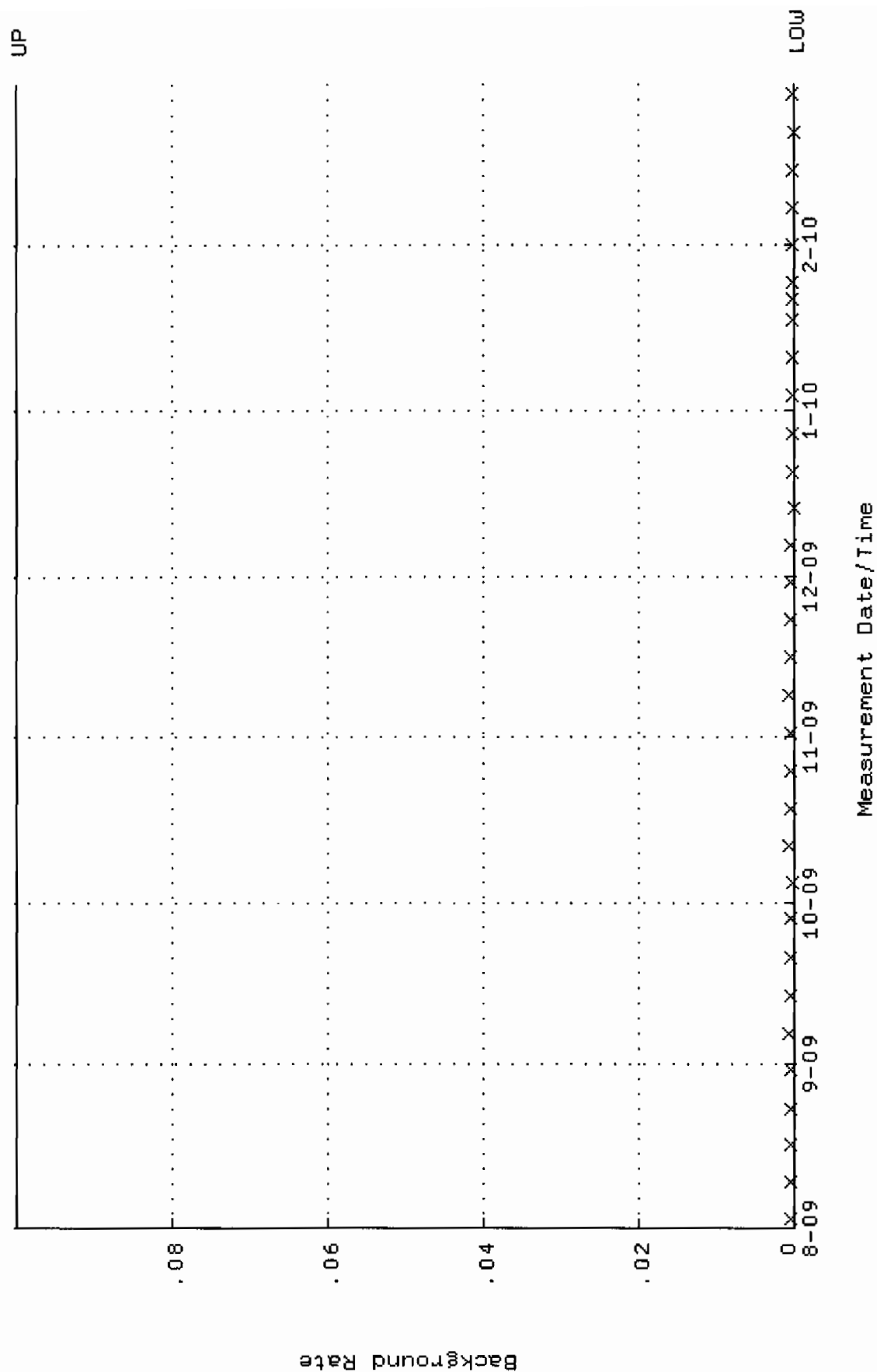


QA filename : DKA100:[ENV\_ALPHA.QA.B]B236.QAF;1

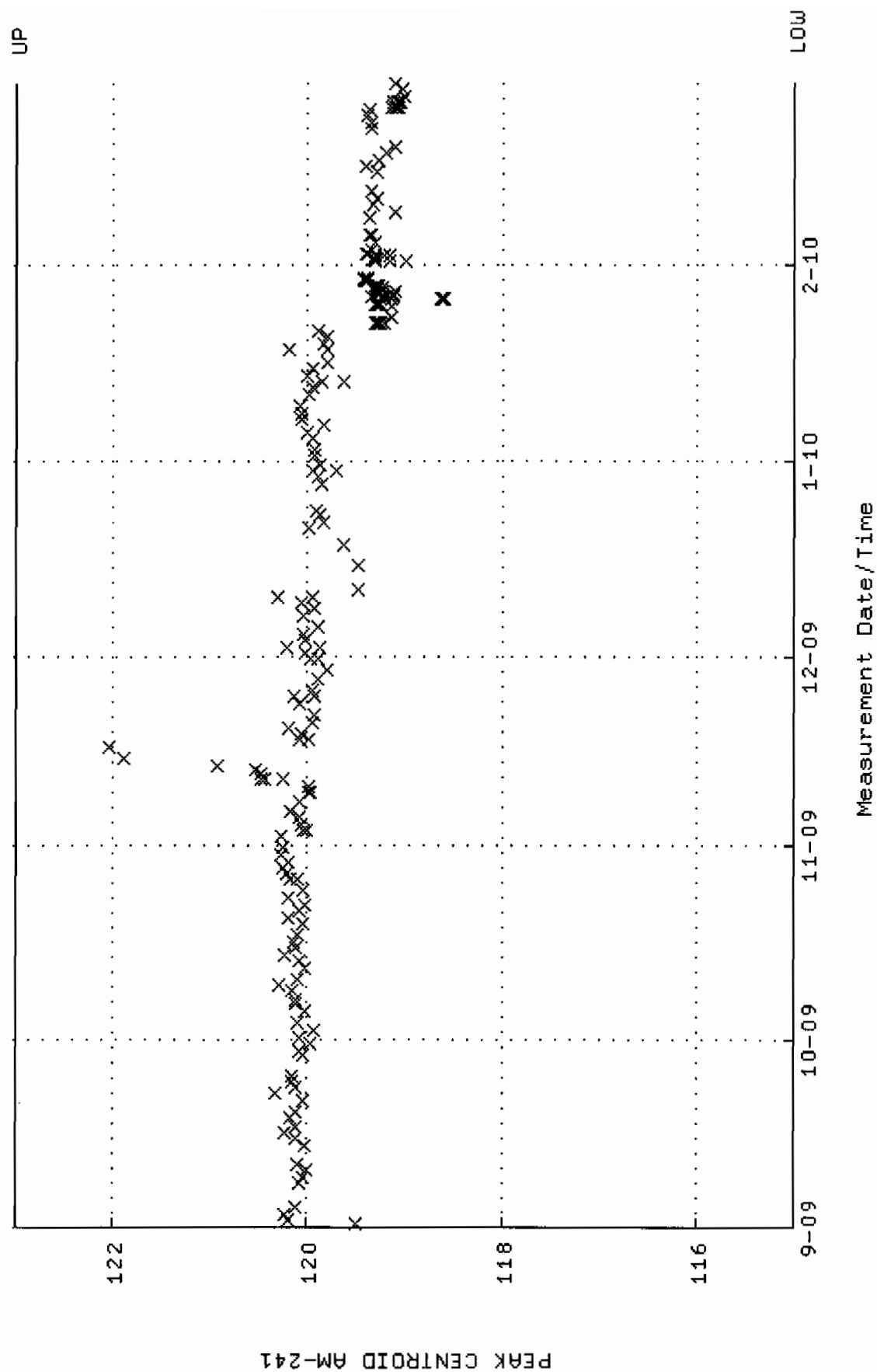
Parameter Name : BACKRATE (Background Rate)

Start/End Dates : 2-AUG-2009 17:27:04 through 2-MAR-2010 12:00:00

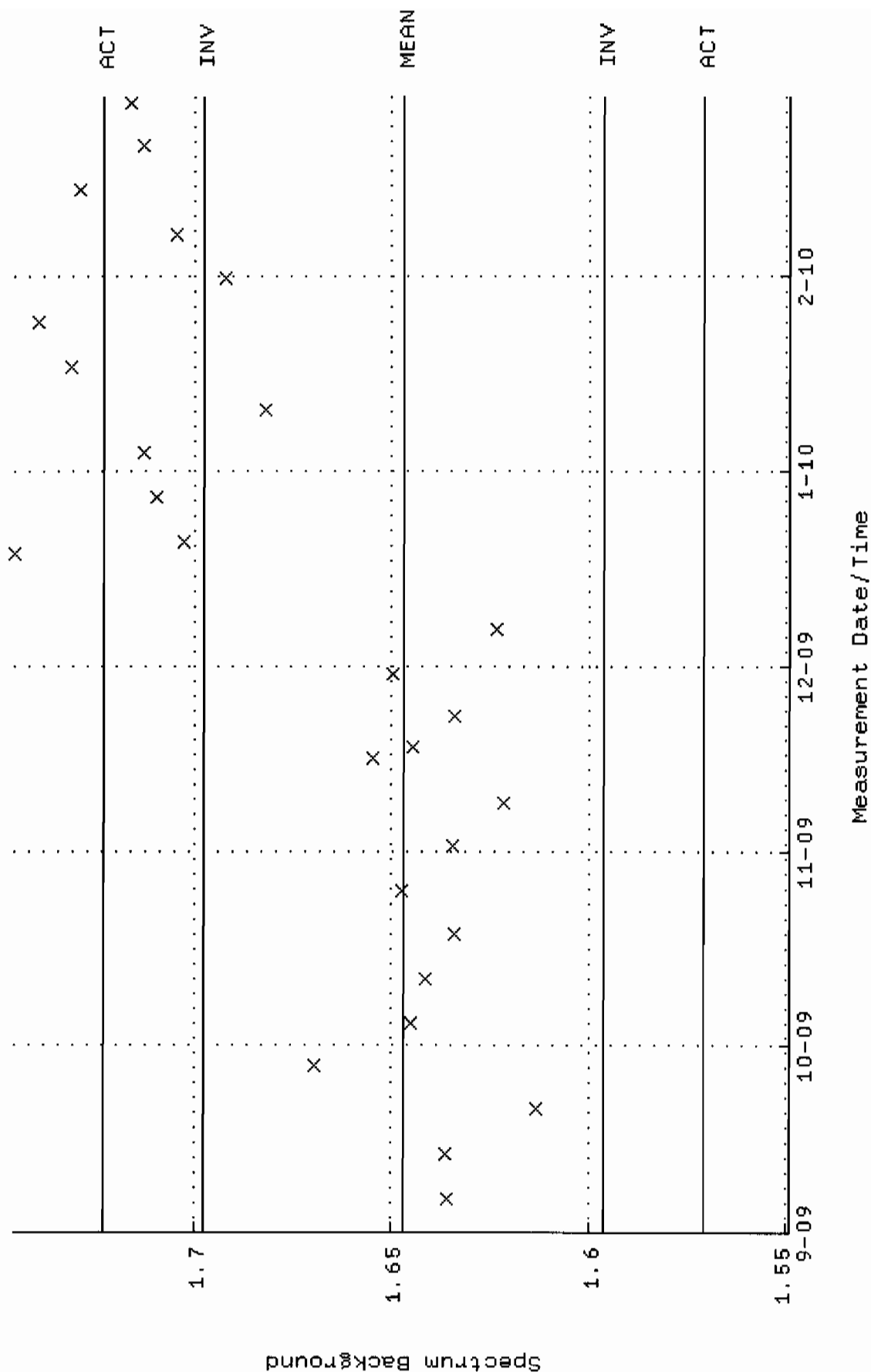
Lower/Upper Lmts: 0.000000E+00 through 0.100000



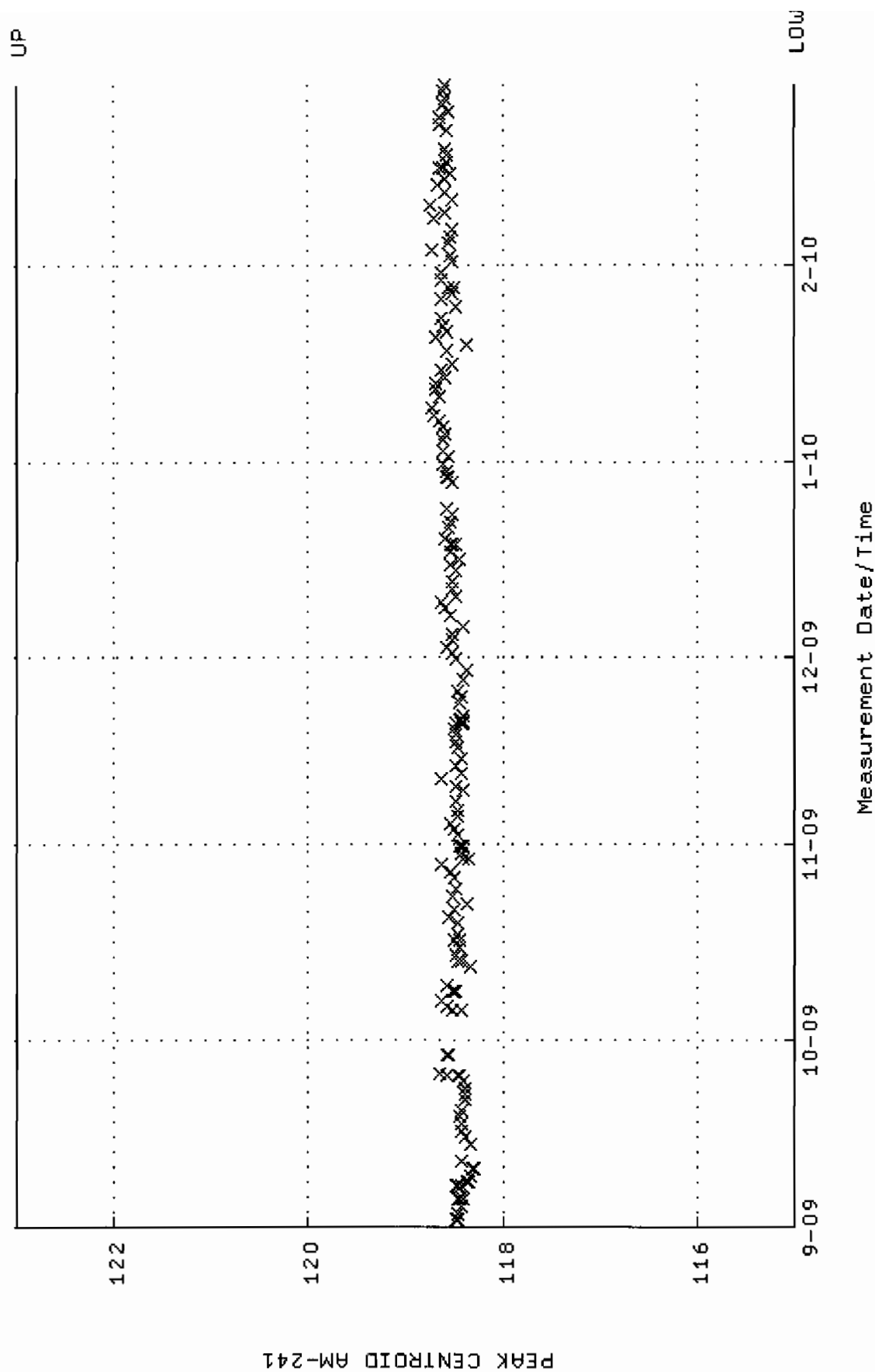
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM05-CAN.QAF;1  
 Parameter Name : PSCENTRD-241 (PEAK CENTROID AM-241)  
 Start/End Dates : 1-SEP-2009 14:54:46 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000



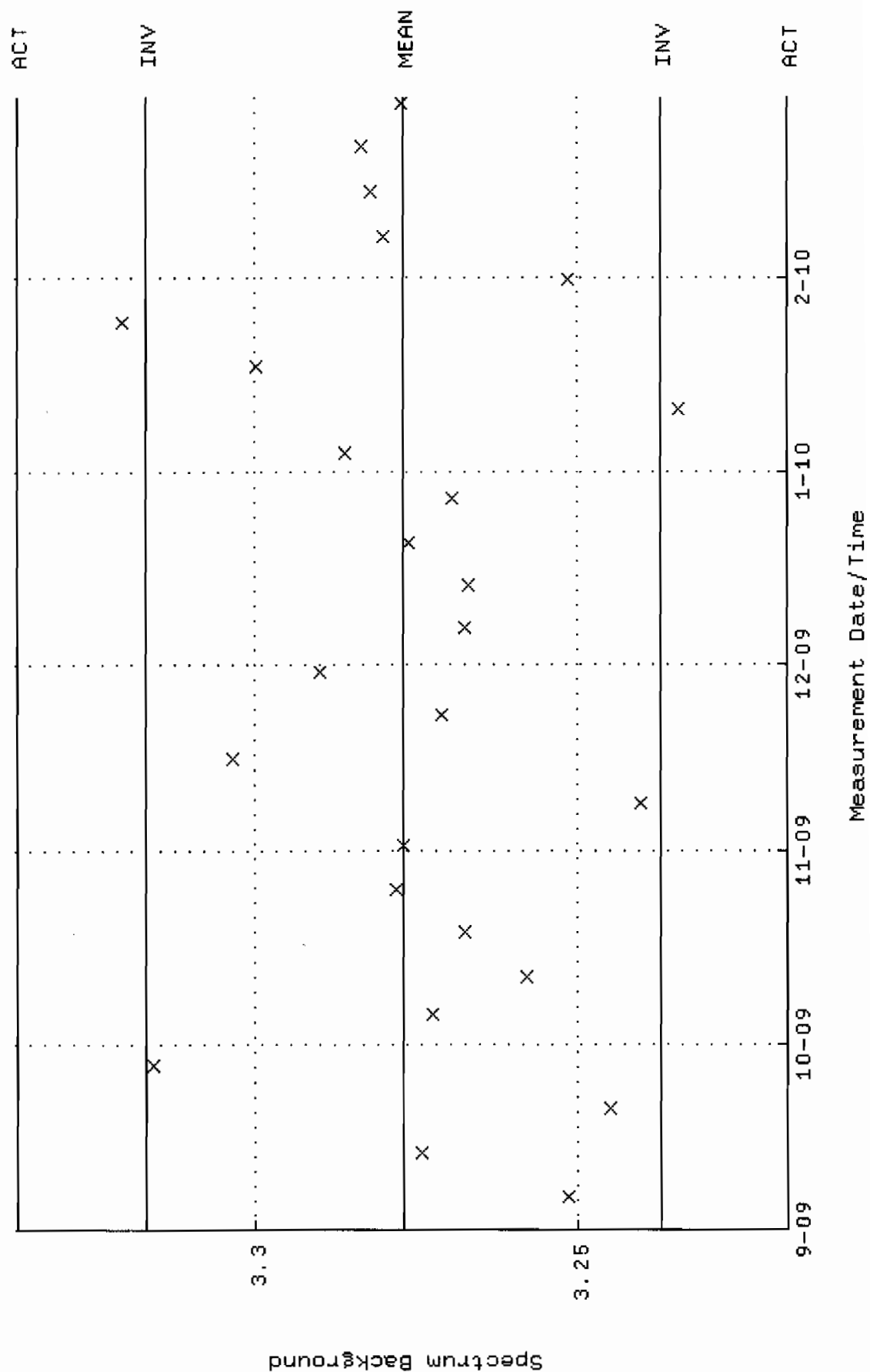
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC\_GAM05.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 6-SEP-2009 11:39:04 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 1.64719 +- 2.547087E-02 (1.55 %)



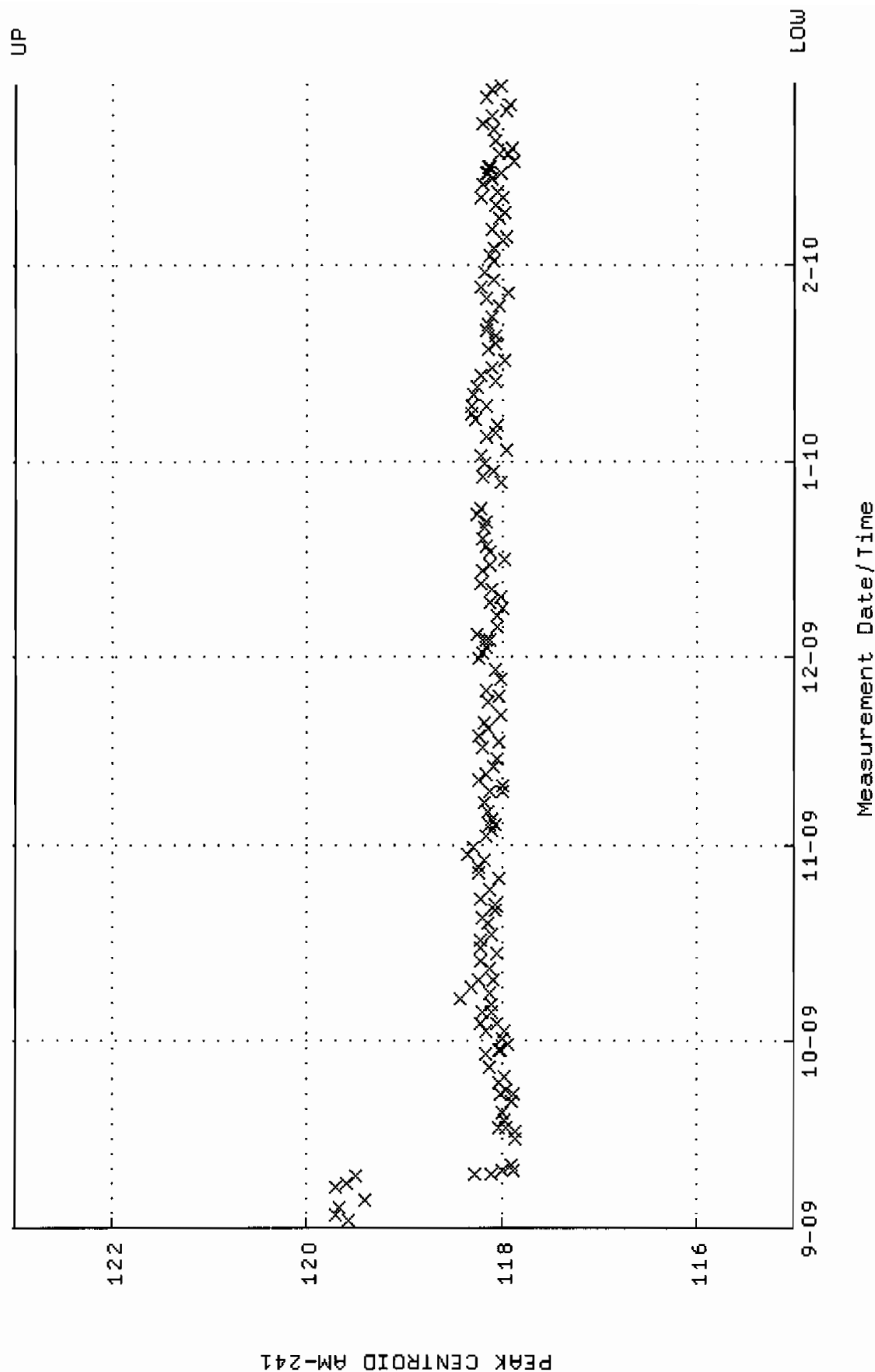
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM13-CAN.QAF;1  
 Parameter Name : PSCENTRD-241 (PEAK CENTROID AM-241)  
 Start/End Dates : 2-SEP-2009 04:40:27 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000



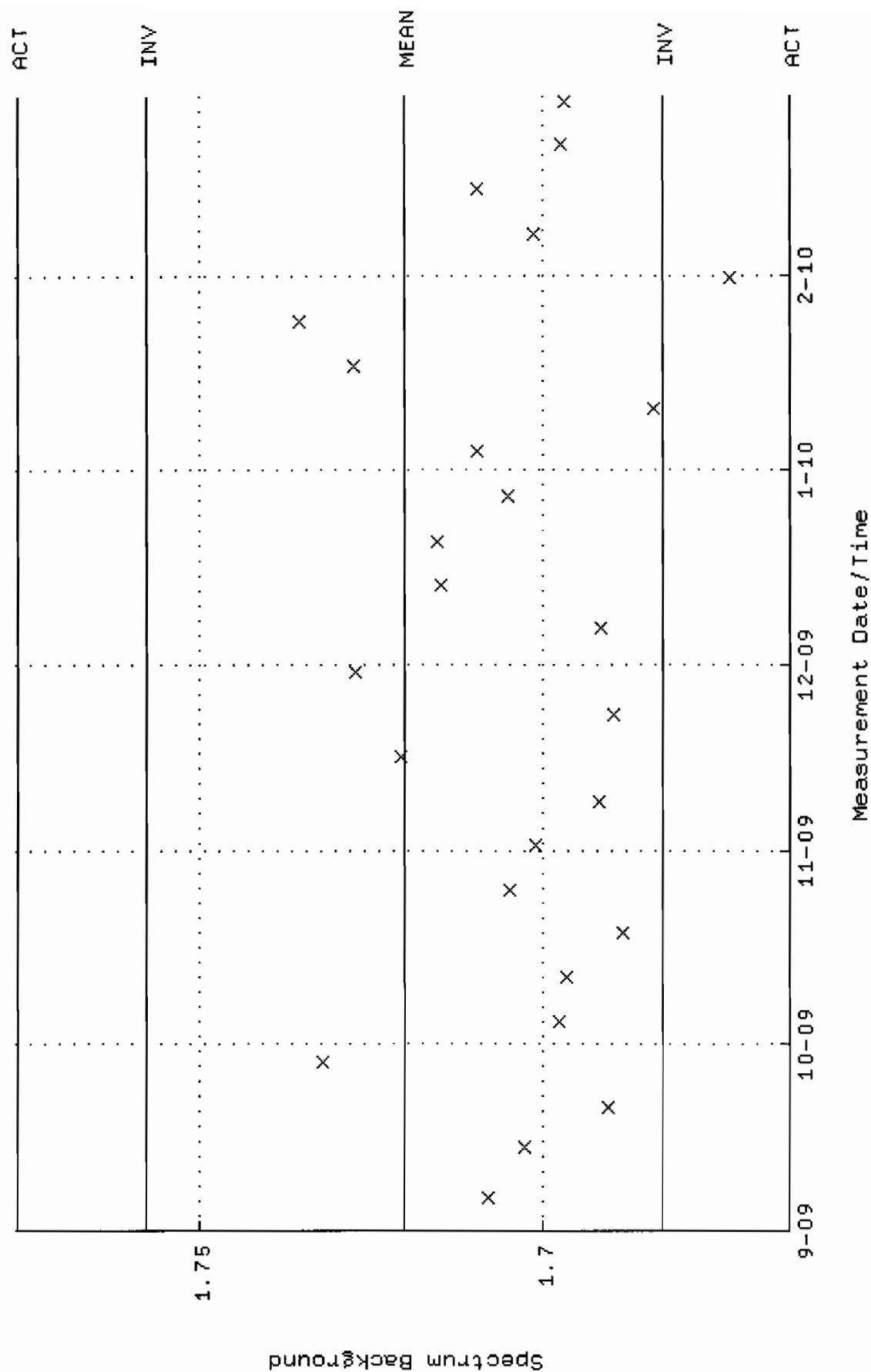
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC\_GAM13.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 6-SEP-2009 11:42:44 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 3.27712 +- 1.999120E-02 (0.61 %)



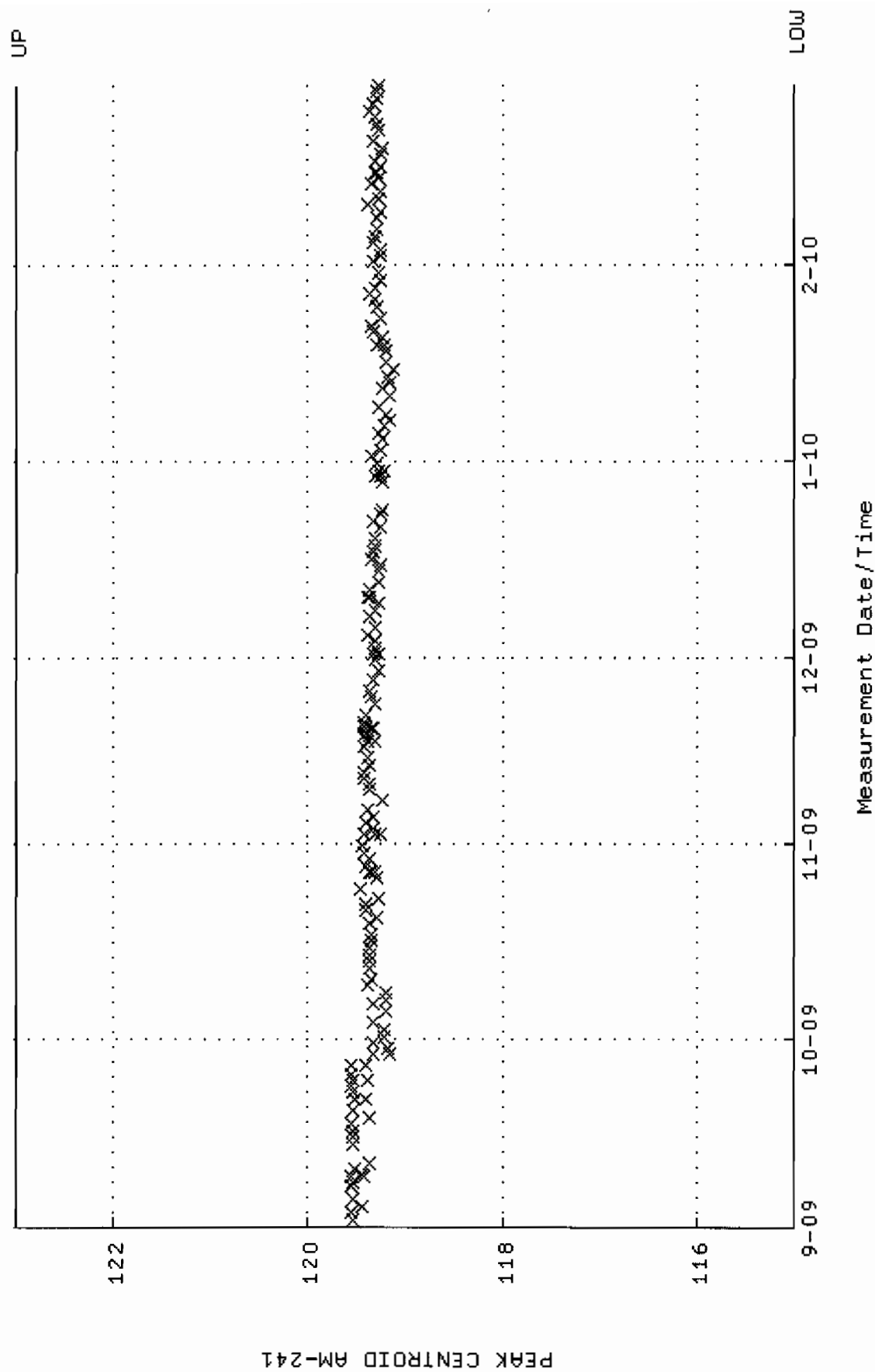
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM15\_CAN.QAF;1  
 Parameter Name : PSCENTRD-241 (PEAK CENTROID AM-241)  
 Start/End Dates : 2-SEP-2009 06:32:23 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000



QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC\_GAM15.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 6-SEP-2009 11:43:44 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 1.72024 +- 1.875820E-02 (1.09 %)

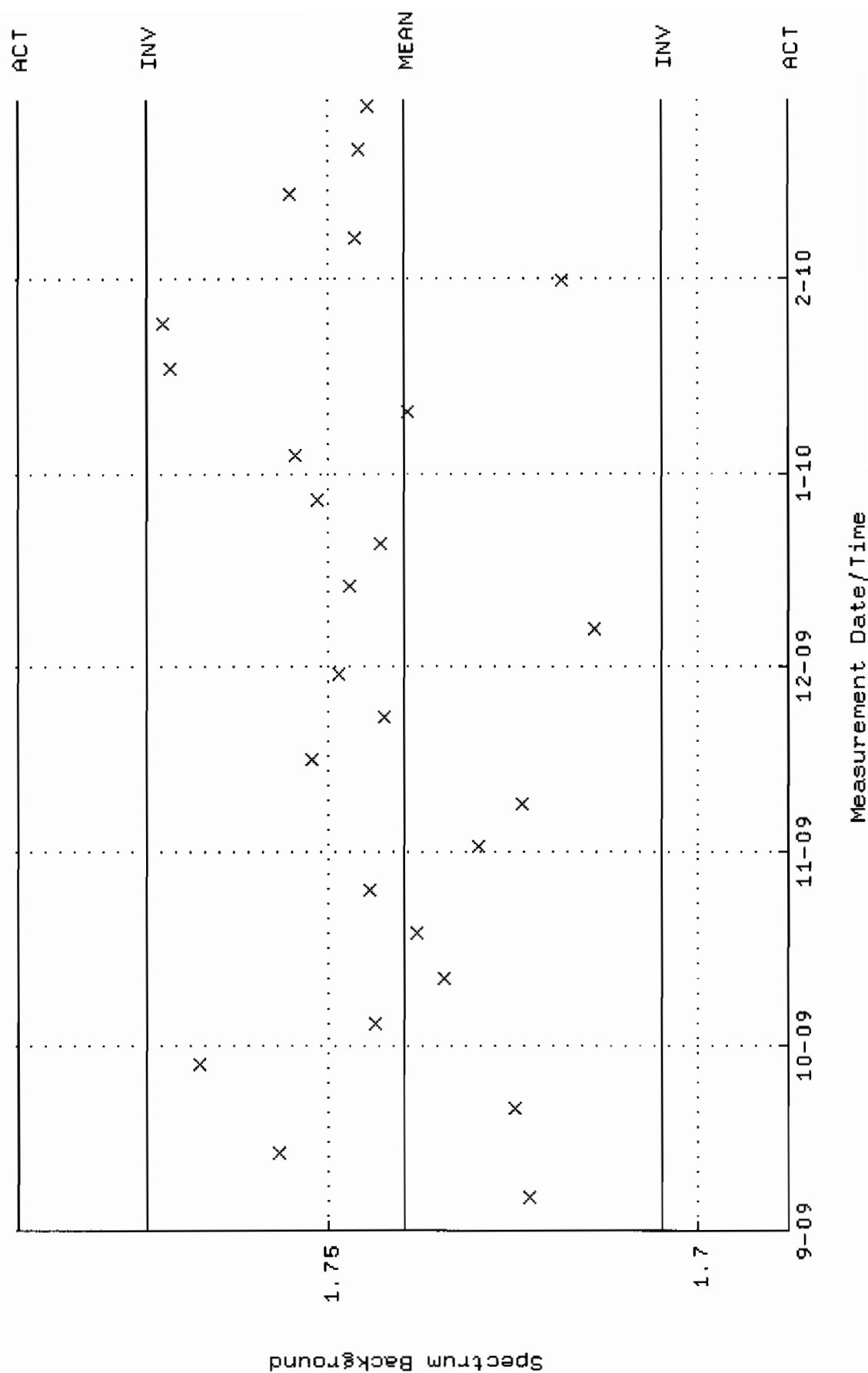


QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM16\_CAN.QAF;1  
 Parameter Name : PSCENTRD-241 (PEAK CENTROID AM-241)  
 Start/End Dates : 2-SEP-2009 04:53:02 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000

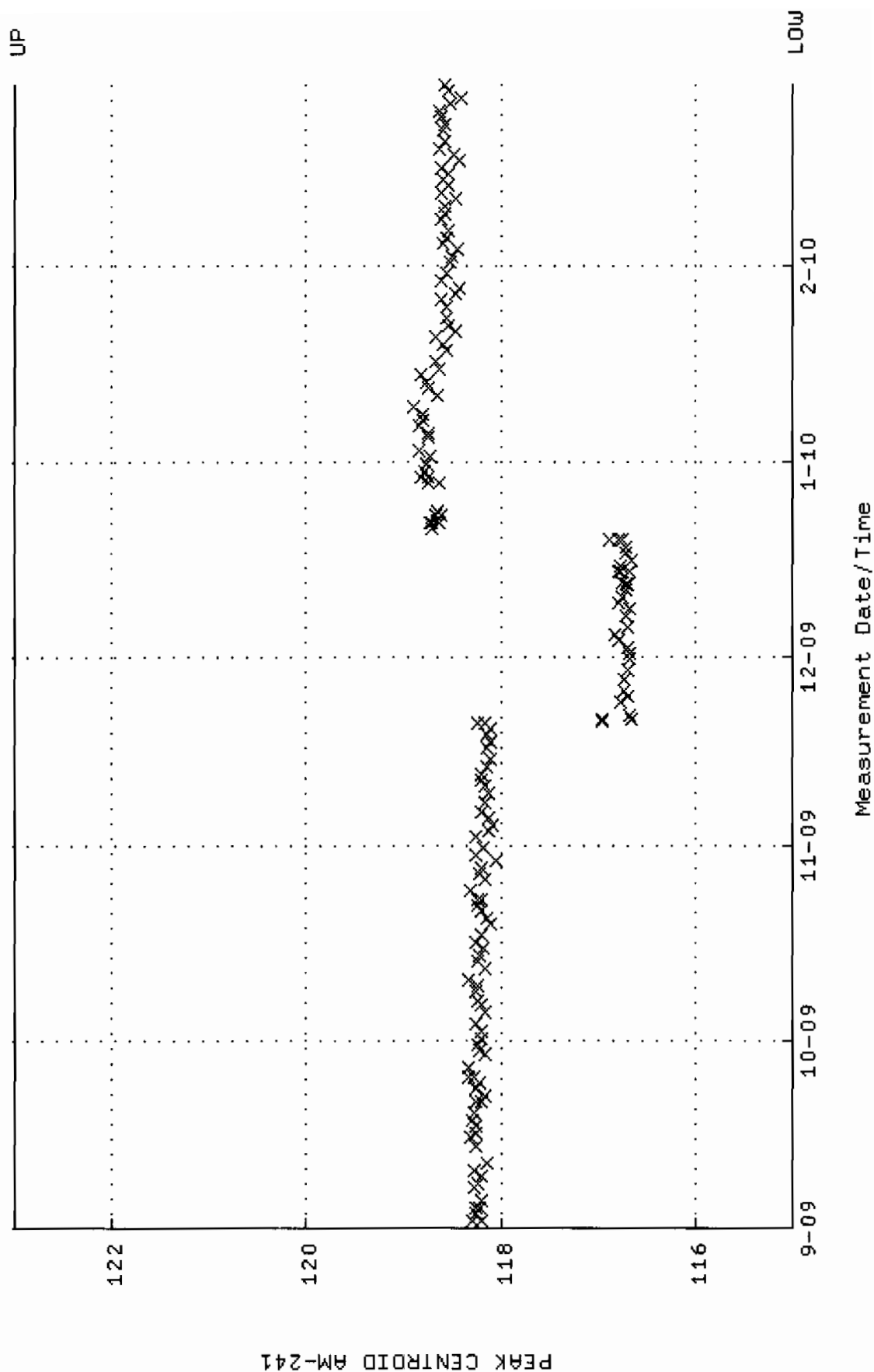




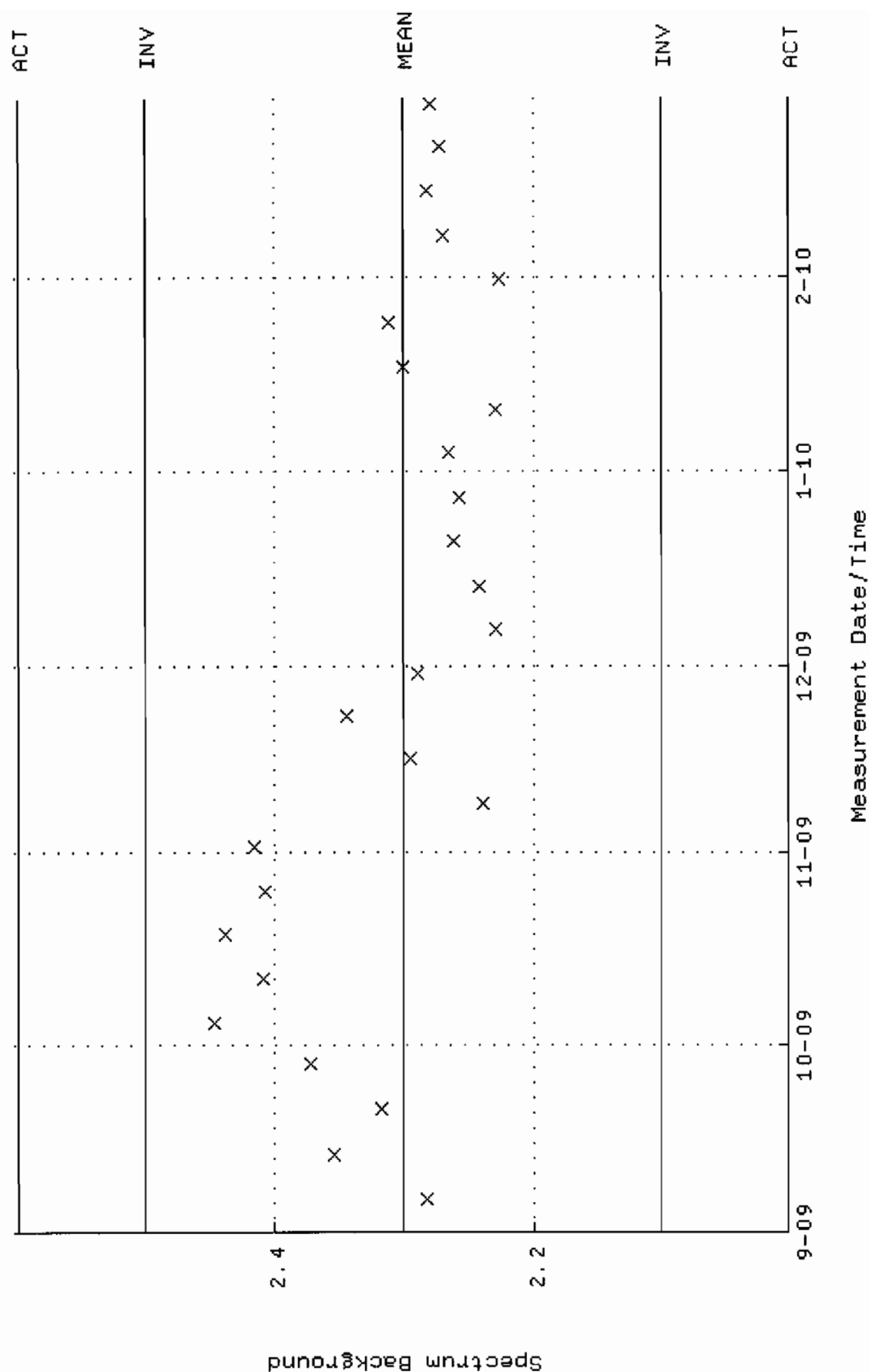
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC\_GAM16.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 6-SEP-2009 11:44:09 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 1.73980 +- 1.729897E-02 (0.99 %)



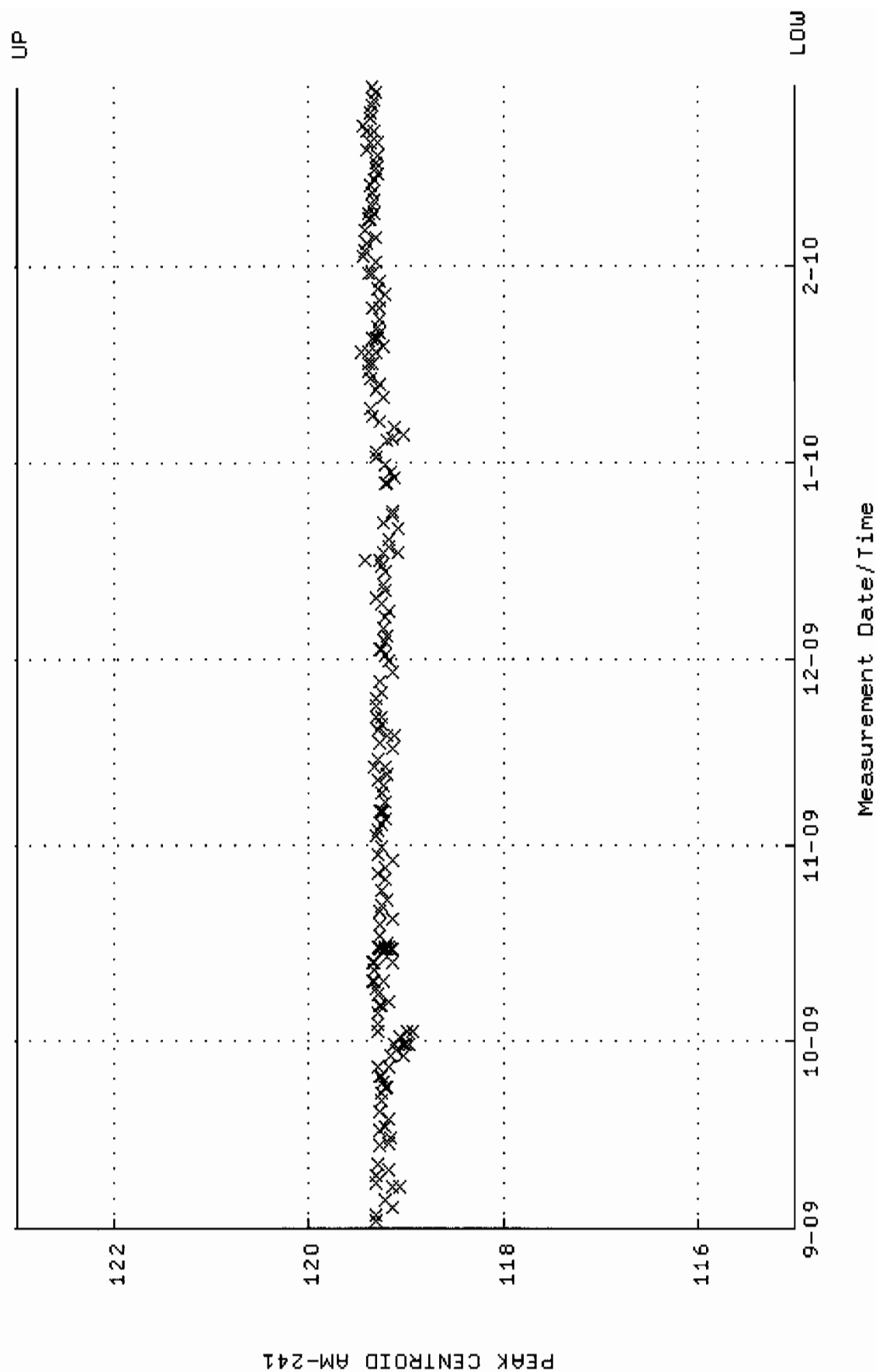
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM18\_CAN.QAF;1  
 Parameter Name : PSCENTRD-241 (PEAK CENTROID AM-241)  
 Start/End Dates : 2-SEP-2009 06:13:07 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000



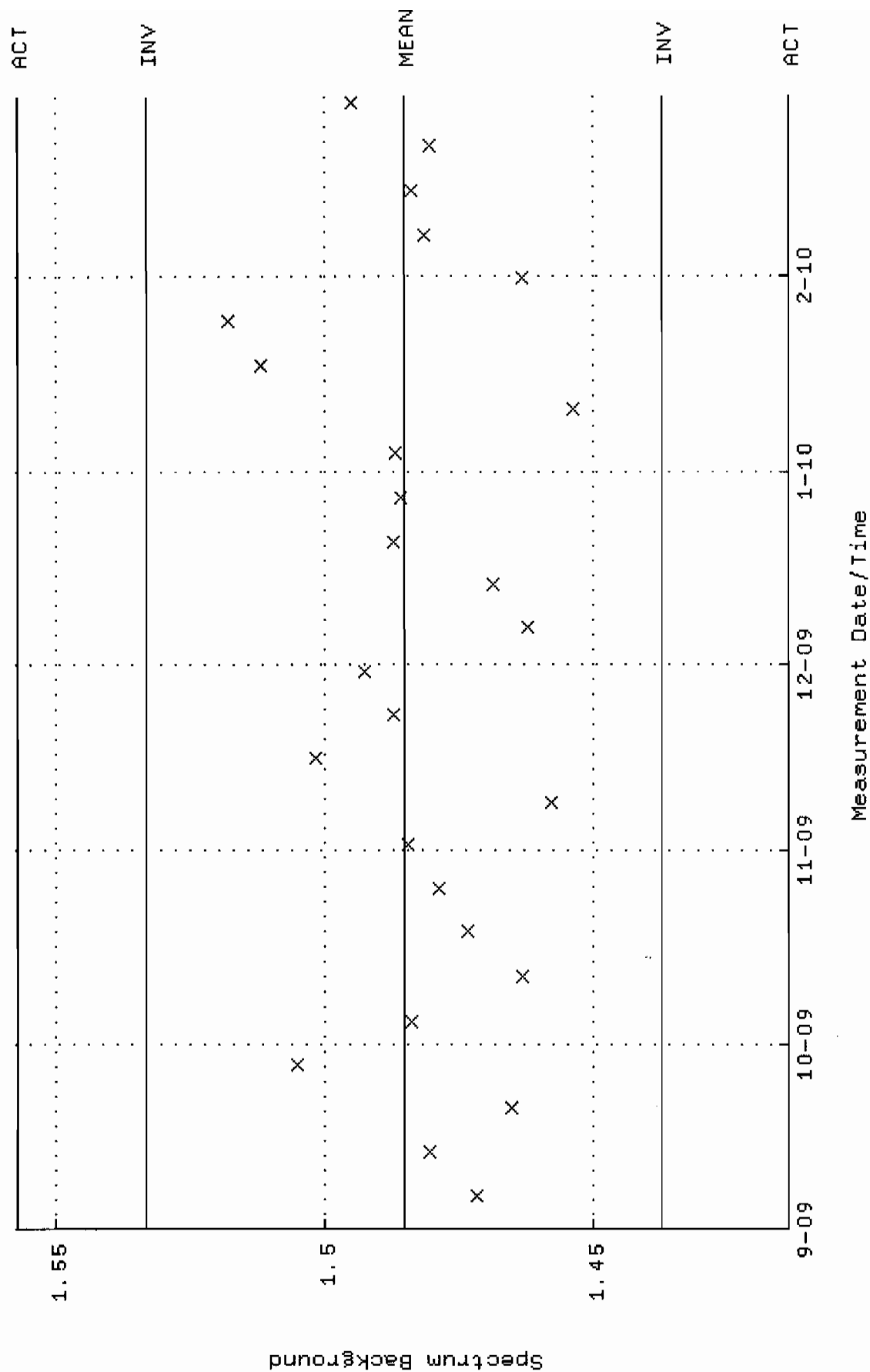
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC\_GAM18.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 6-SEP-2009 11:45:03 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 2.30164 +- 9.930626E-02 (4.31 %)



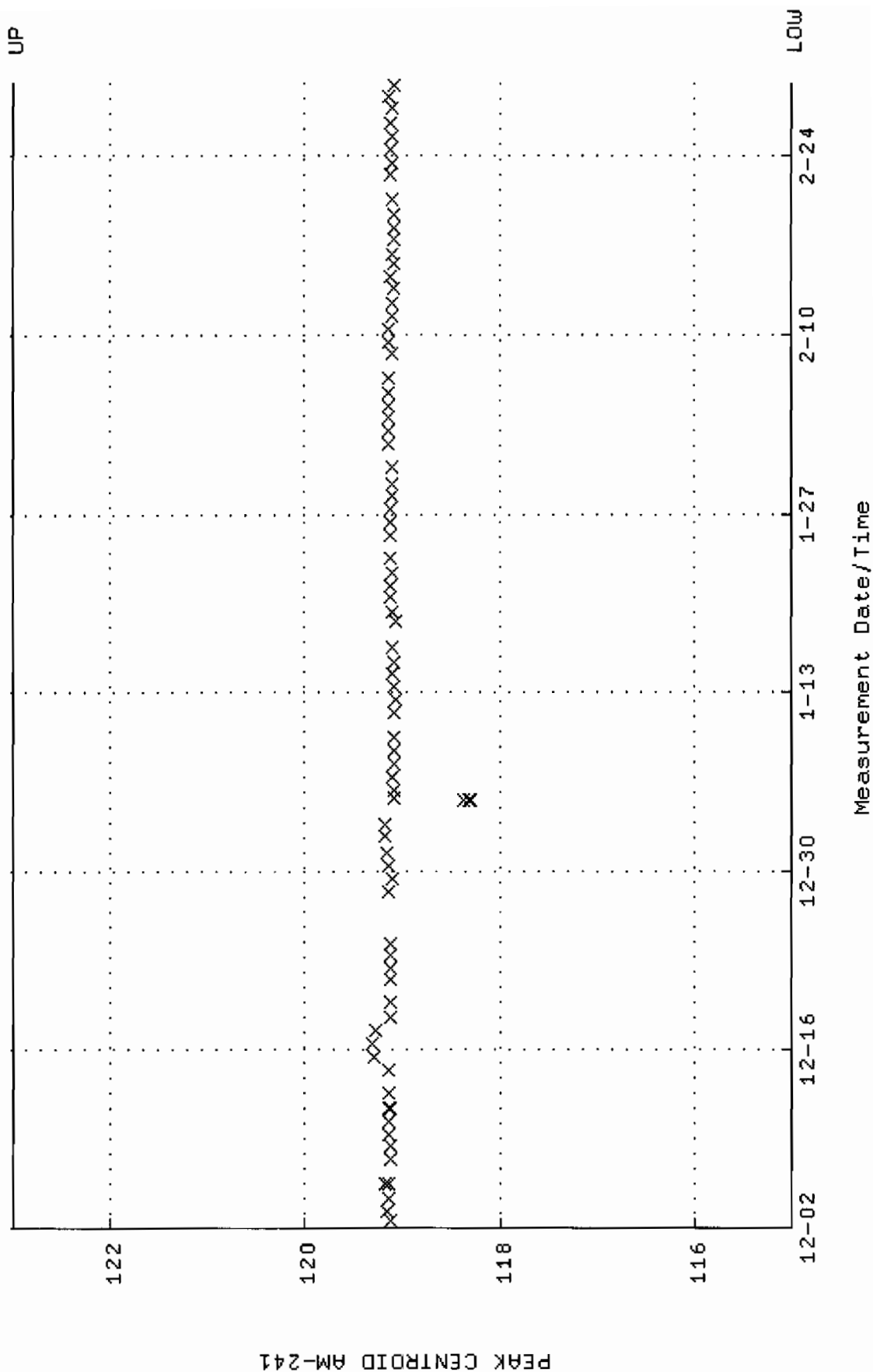
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM20-500MLMB.QAF;1  
 Parameter Name : PSCENTRD-241 (PEAK CENTROID AM-241)  
 Start/End Dates : 2-SEP-2009 04:53:11 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000



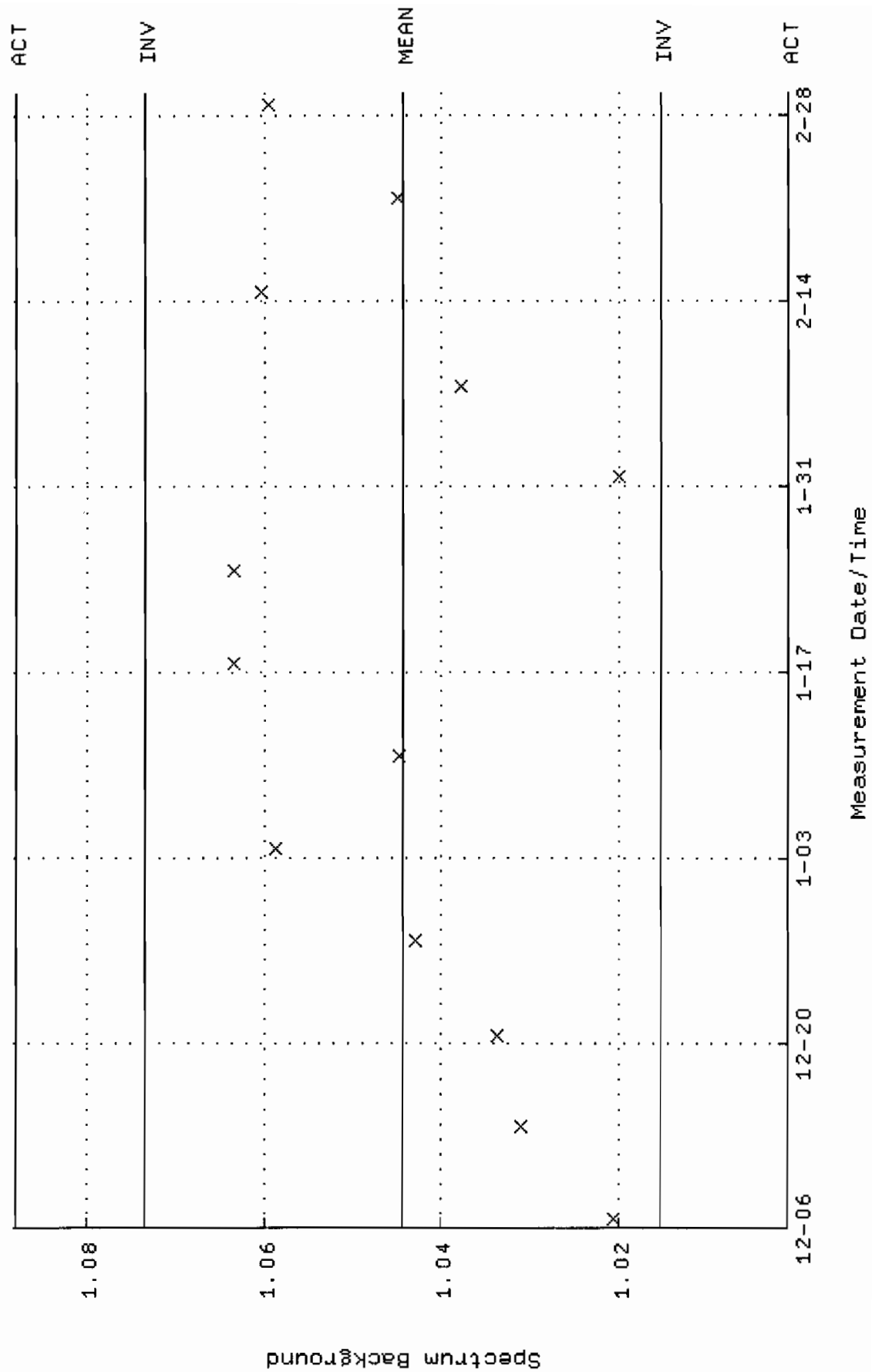
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC-GAM20.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 6-SEP-2009 11:46:04 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 1.48527 +- 2.388665E-02 (1.61 %)



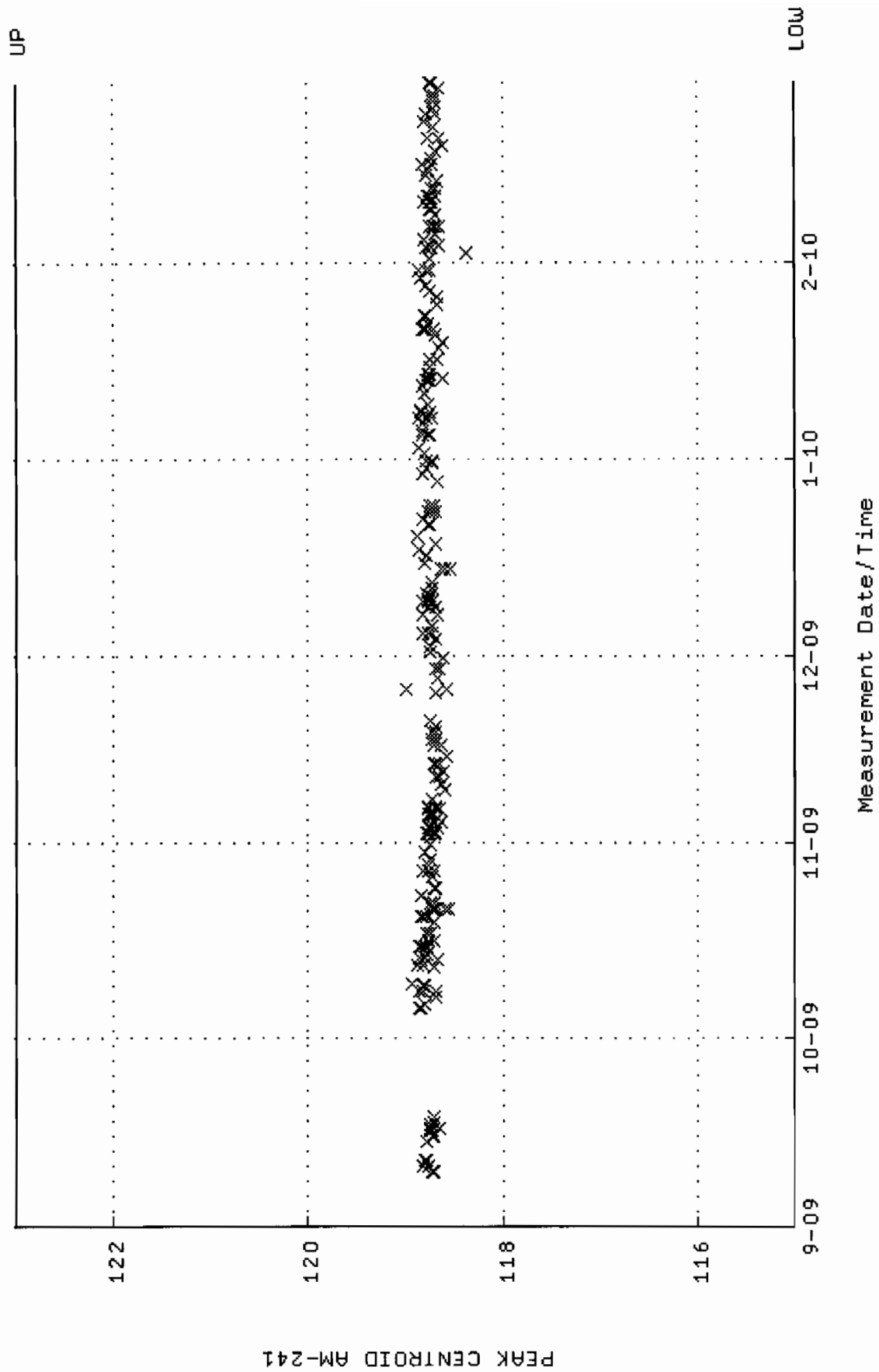
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM21\_CAN.QAF;1  
 Parameter Name : PSCENTRD-241 (PEAK CENTROID AM-241)  
 Start/End Dates : 2-DEC-2009 13:07:42 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000



QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC\_GAM21.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 6-DEC-2009 15:25:38 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 1.04443 +- 1.452671E-02 (1.39 %)

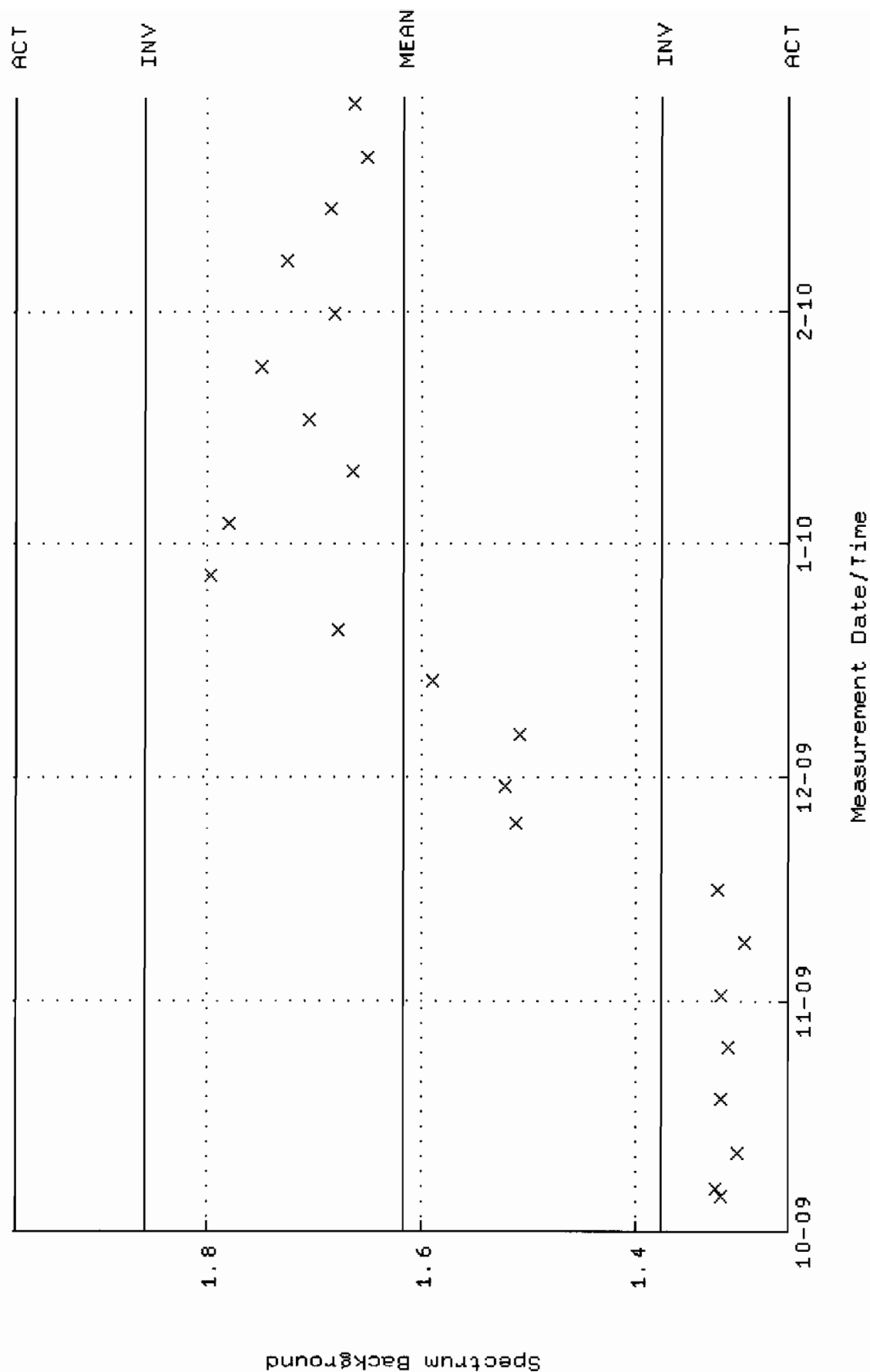


QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM23\_CAN.QAF;1  
 Parameter Name : PSCENTRD-241 (PEAK CENTROID AM-241)  
 Start/End Dates : 9-SEP-2009 16:19:12 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000

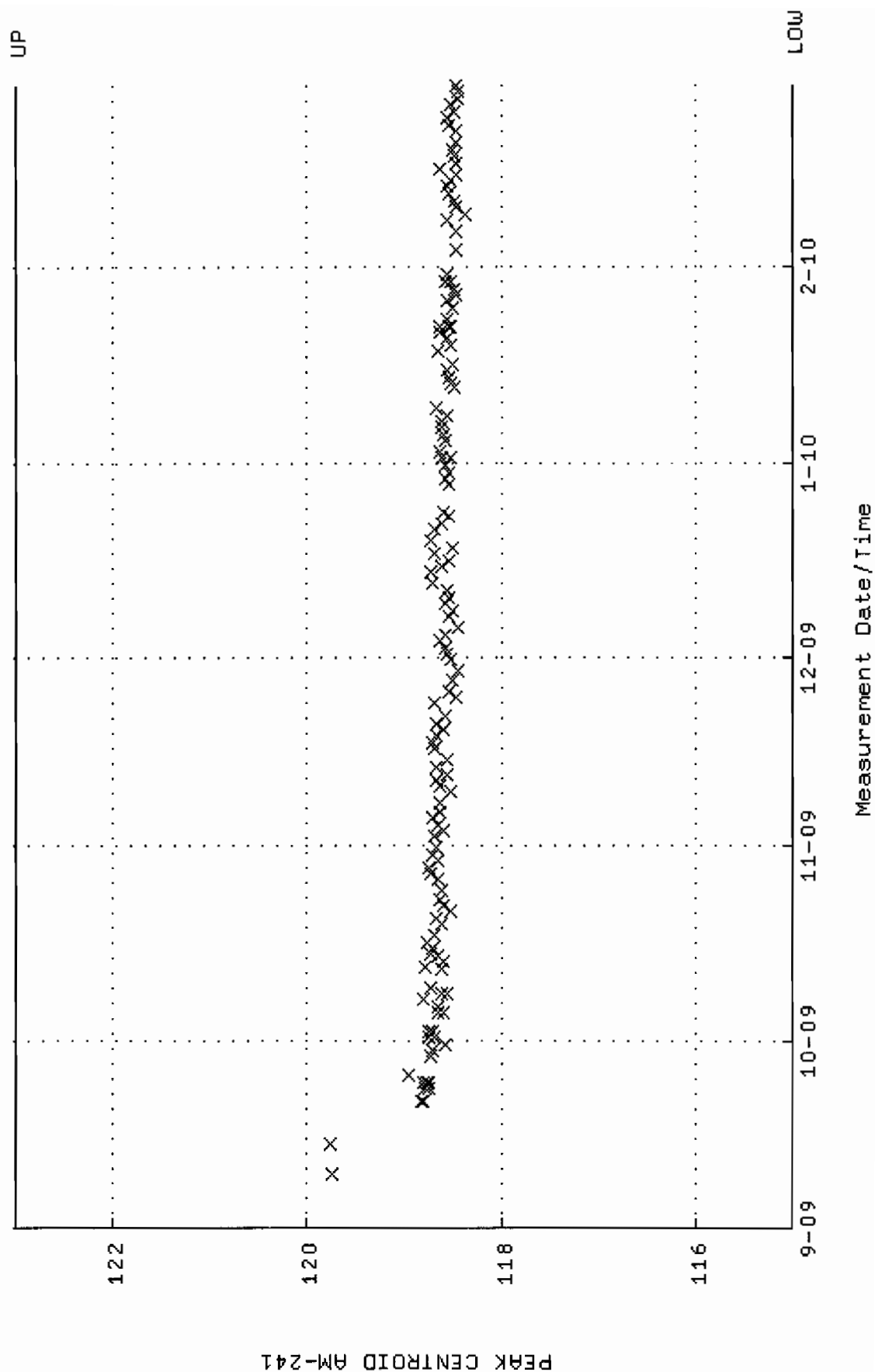




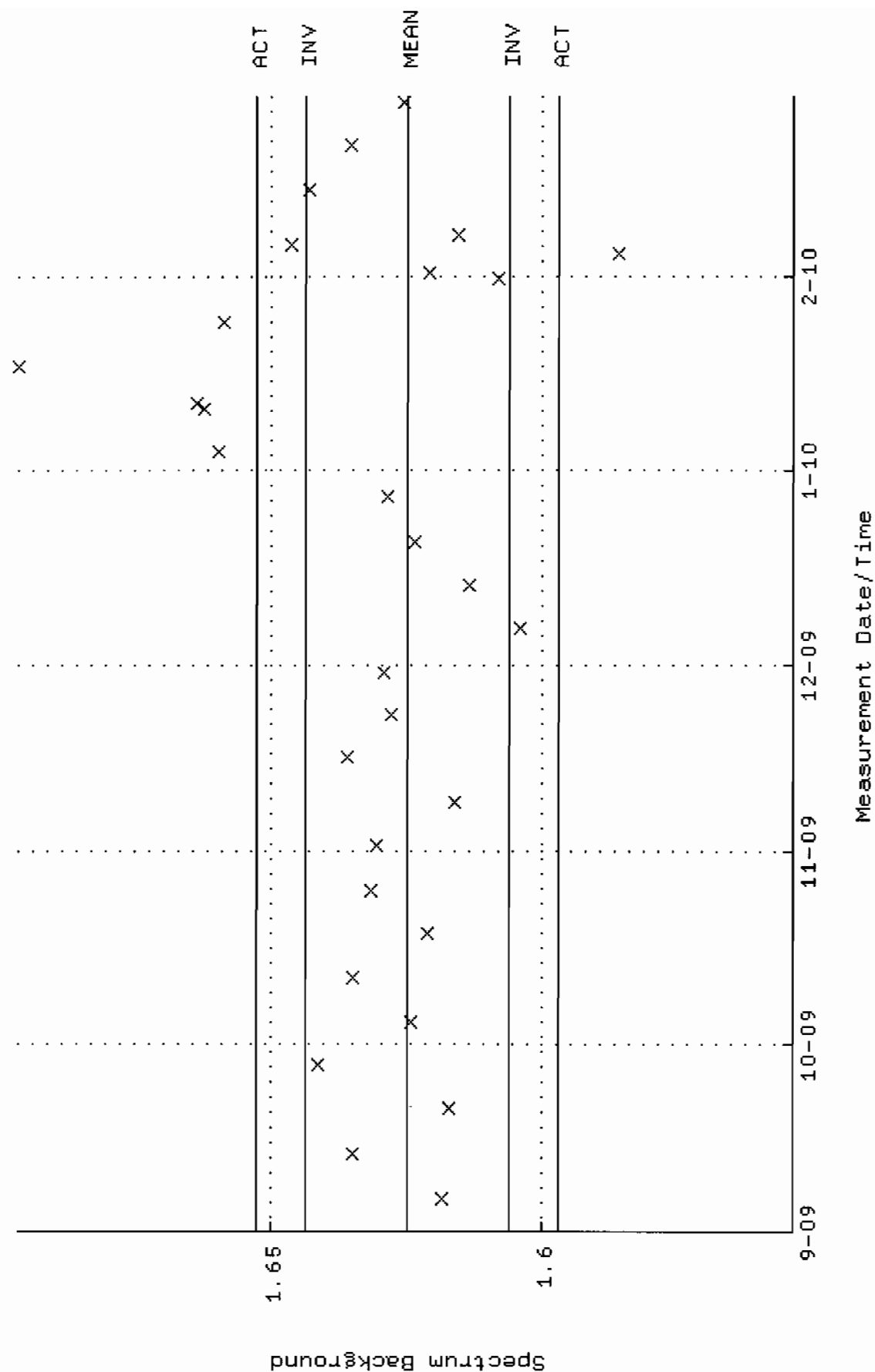
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC-GAM23.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 5-OCT-2009 15:13:53 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 1.61827 +- 0.119991 (7.41 %)

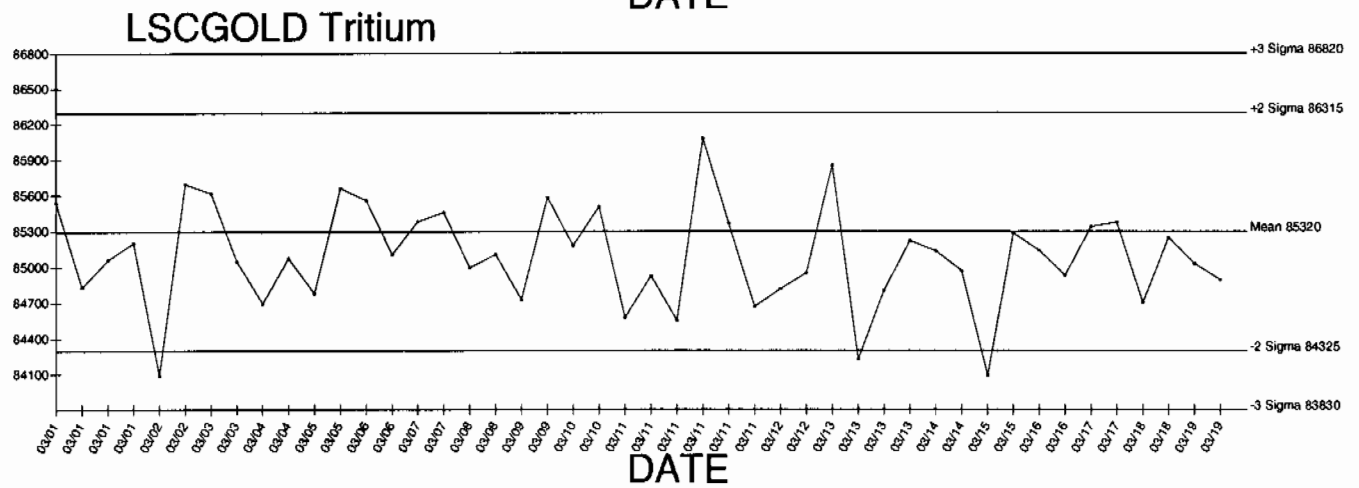
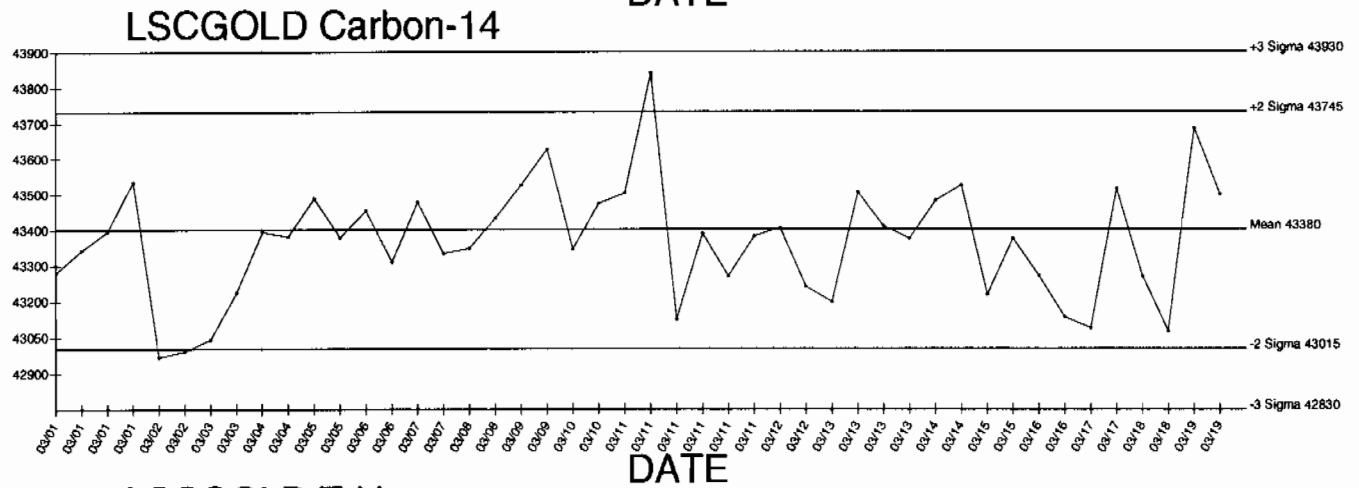
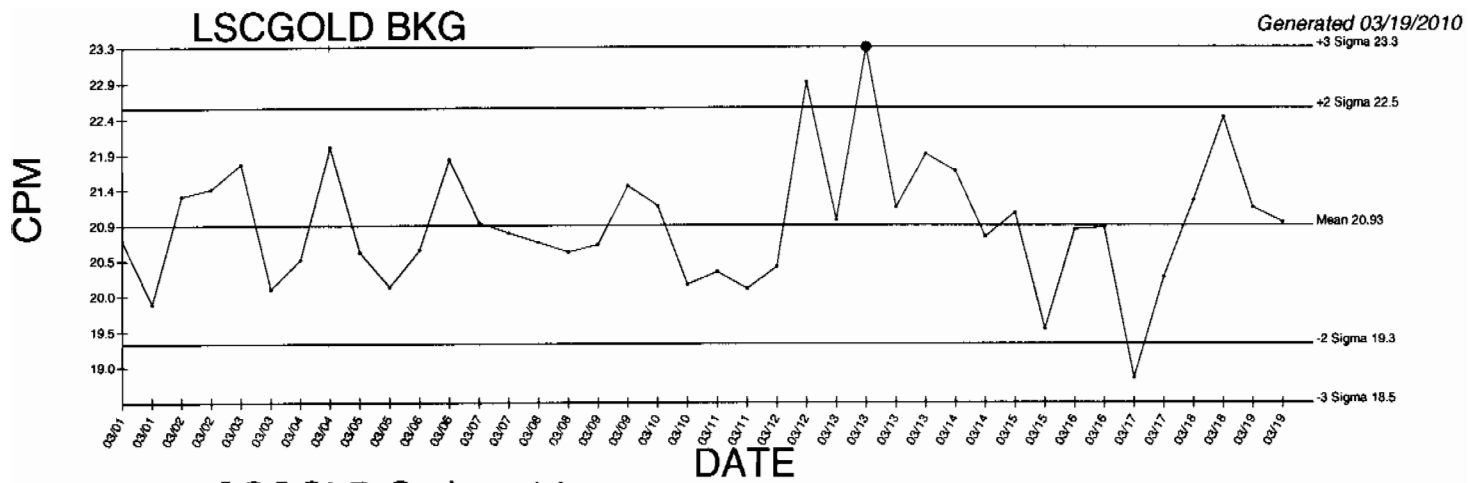


QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM25-2LMB.QAF;1  
 Parameter Name : PSCENTRD-59 (PEAK CENTROID AM-241)  
 Start/End Dates : 9-SEP-2009 16:18:34 through 1-MAR-2010 12:00:00  
 Lower/Upper Lmts: 115.000 through 123.000

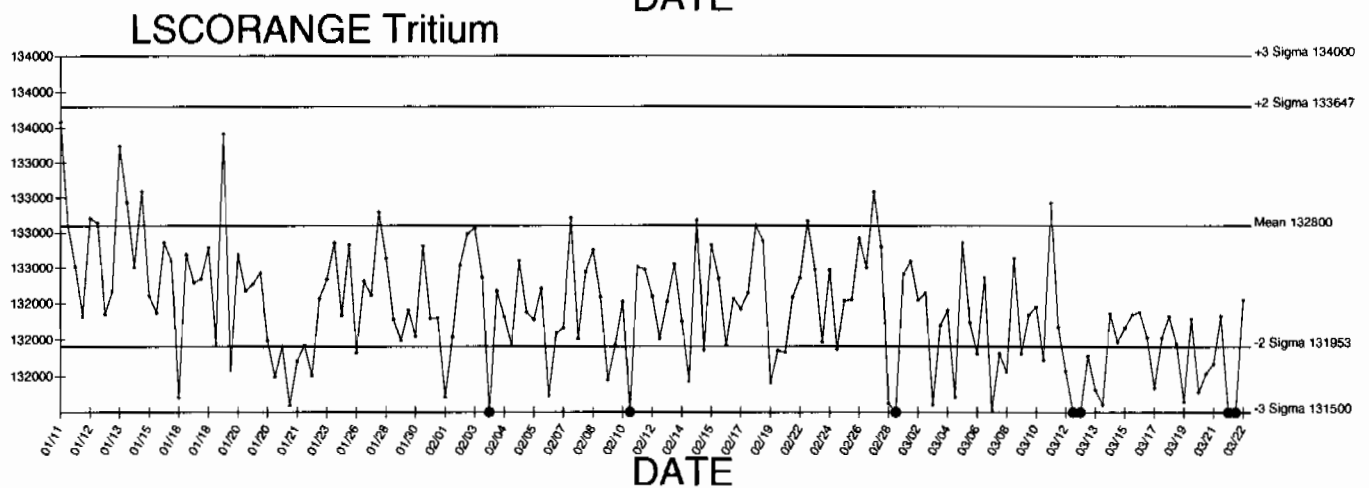
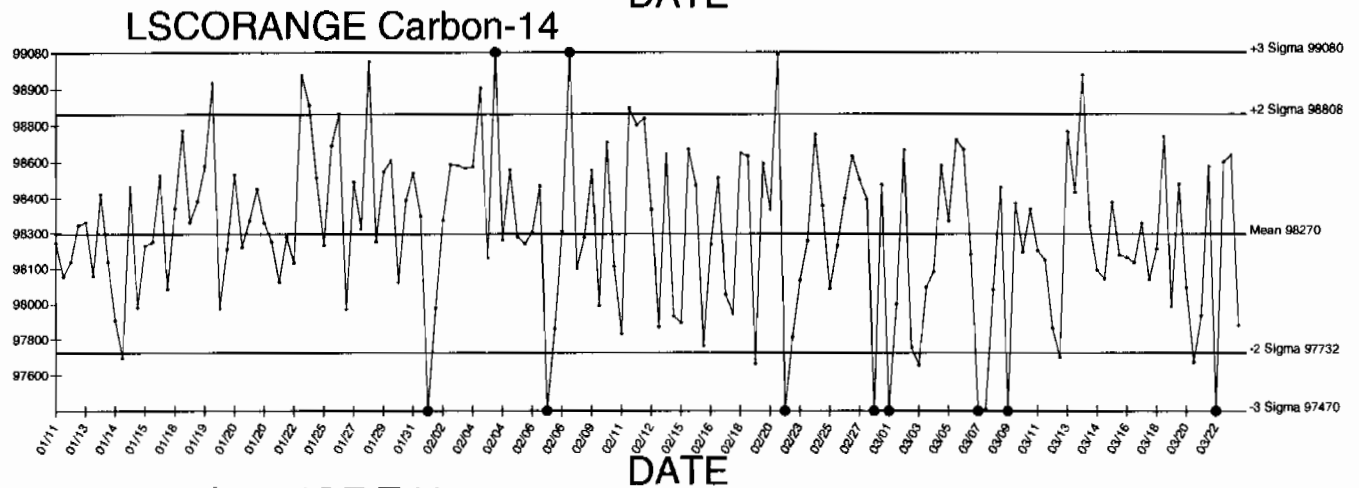
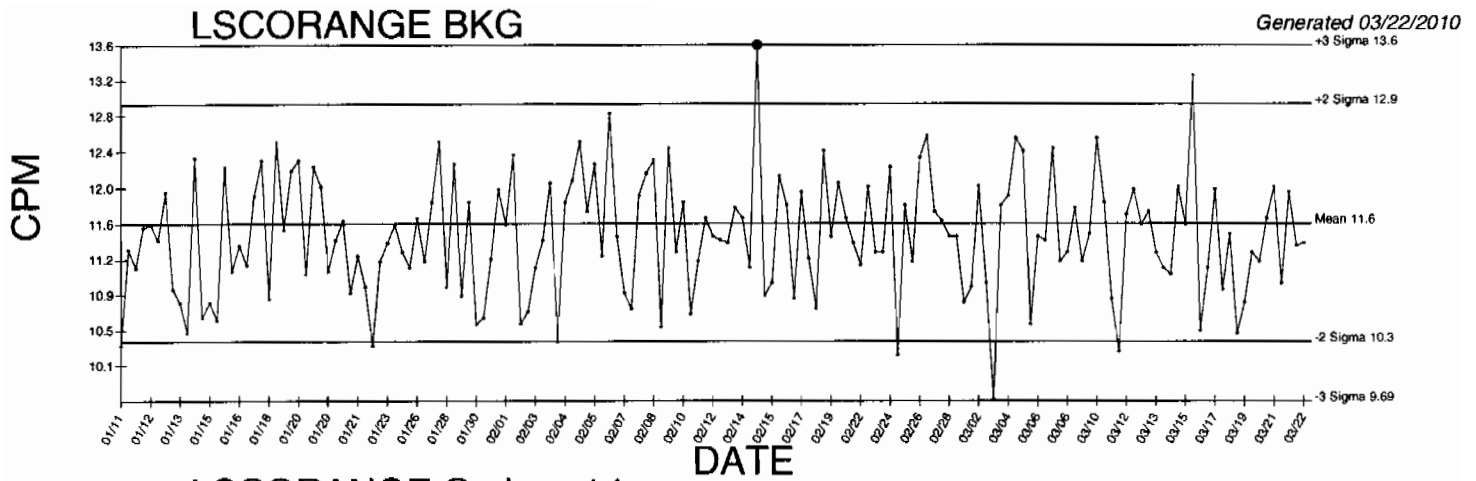


QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC\_GAM25.QAF;1  
 Parameter Name : BACKRATE (Spectrum Background Rate)  
 Start/End Dates : 6-SEP-2009 11:47:27 through 1-MAR-2010 12:00:00  
 Mean +- Std Dev : 1.62502 +- 9.370414E-03 (0.58 %)

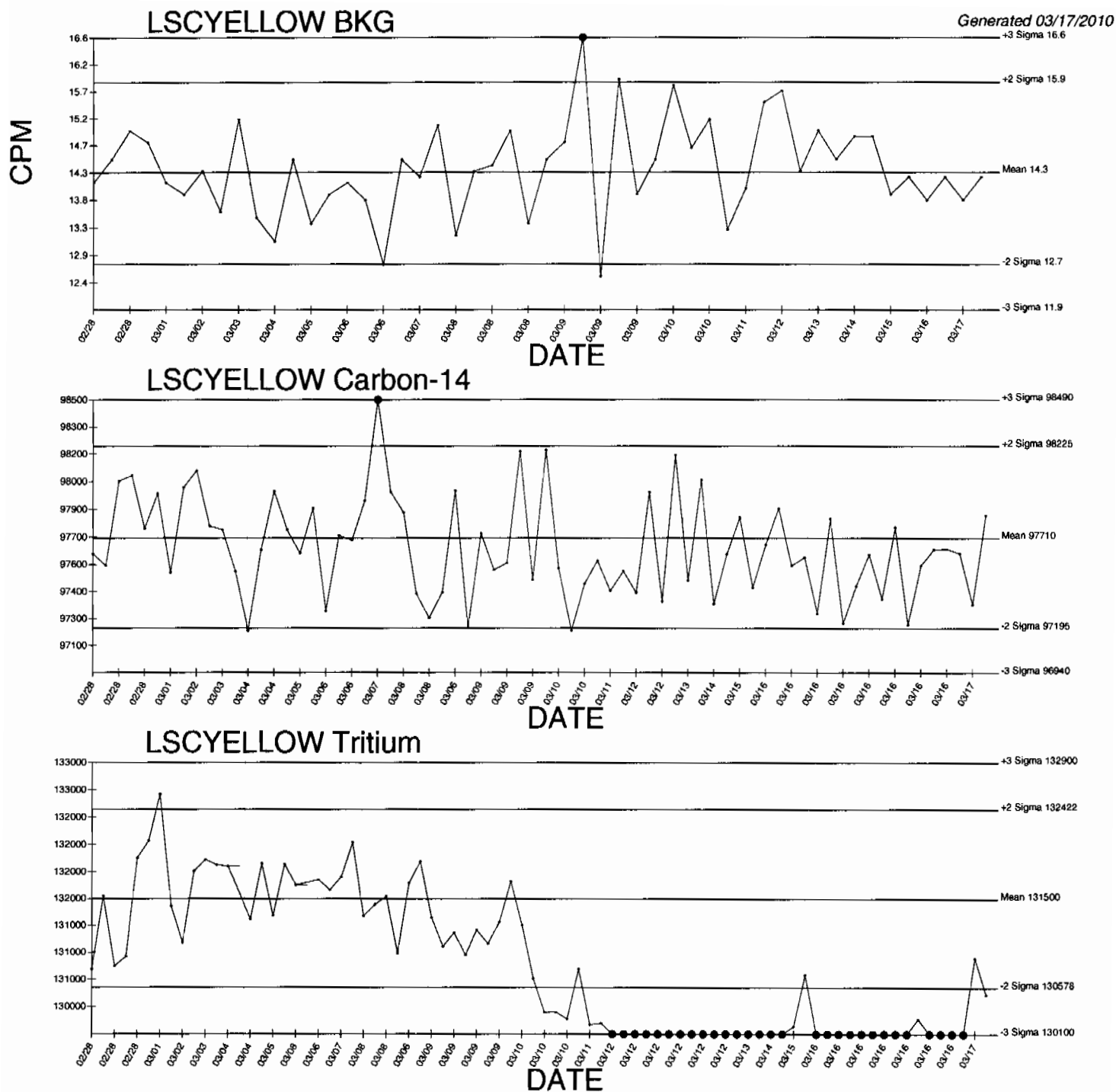




● Denotes Outlier



● Denotes Outlier



# STANDARDS DATA

0134



CALIBRATION  
No. 0146

**Description** Radionuclide: TRITIUM (HYDROGEN-3) Product code: TRY-64  
Chemical form: water Batch: 111

**Measurement** Reference time: 1200 GMT on 1 March 1996  
Radioactive concentration of tritium: 488.0 kilobecquerels per gram of water  
which is equivalent to: 13.19 microcuries per gram of water  
or:  $2.93 \times 10^7$  disintegrations per minute per gram of water

**Method of Measurement**

This reference material was calibrated by direct comparison with a standard of tritium-labelled water obtained from the National Institute of Standards and Technology, USA.

**Accuracy** The OVERALL UNCERTAINTY of the result quoted above is estimated to be less than  $\pm 2.5\%$

This estimate of uncertainty was calculated in accordance with the recommendations of the International Commission on Radiation Units and Measurements (ICRU Report 12). The limits of uncertainty were taken as the arithmetic sum of the uncertainty due to random variations, calculated at the 99.7% confidence level, and the estimated systematic uncertainties.

**Purity** No radioactive impurities were detected. (Impurities with total activity greater than 0.001% of the activity of the tritium would have been detected).

**Physical Data** Half-life of tritium:  $12.43 \pm 0.11$  years  
Maximum beta energy of tritium: 18.6 keV

**Remarks:** The S.I. unit of radioactivity is the becquerel.

1 becquerel (Bq) = 1 nuclear transformation per second, therefore  
1 curie (Ci) =  $3.7 \times 10^{10}$  becquerels exactly.

Useful conversion factors are:

1 microcurie ( $\mu\text{Ci}$ ) =  $3.7 \times 10^4$  Bq = 37 kilobecquerels (kBq)

1 kilobecquerel (kBq) = 27.027 nanocuries (nCi)

This product meets the quality assurance requirements of NRC Regulatory Guide 4.15 for achieving implicit NIST (NBS) traceability as defined in NCRP58 (1985).

**Approved  
signatory**

*W. F. Case*

2C-5-023-061a



# Standard Traceability Log Rad

| Source Material Info |                |
|----------------------|----------------|
| Parent Code:         | 0134           |
| Prepared By:         | Angela Johnson |
| Carrier Conc:        | DI WATER       |
| Reference Date:      | 03/01/1996     |
| Ampoule Mass (g):    | 5 g            |
| Uncertainty:         | +/- 2.5 %      |
| LogBook No:          | RC S 023 061   |

| A Solution Material Info |                |
|--------------------------|----------------|
| Isotope:                 | Tritium        |
| Prepared By:             | Angela Johnson |
| Prep Date:               | 02/21/2001     |
| Verification Date:       | 09/10/2008     |
| Expiration Date:         | 03/27/2010     |
| Primary Code:            | 0134-A         |
| Dilution(mL):            | 100 mL         |
| Mass of Parent(g):       | 3.3659 g       |
| Density(g/mL):           | 1.0004         |
| Balance ID:              | 38080204       |

## Calculations Converting parent activity to dpm/mL|dpm/g

|   |
|---|
| $(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$                        |
| $(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$ |
| $(3.3659 \text{ g}) * (488 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 985535.5200 \text{ dpm/mL}$  |
| $(3.3659 \text{ g}) * (488 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0004 \text{ g/mL}) / (100 \text{ mL}) = 985180.3116 \text{ dpm/g}$                                     |

## Secondary Standards

| Prep Date  | Preparer    | Mass Primary | Dilution (mL) | Code   | Conc dpm/mL      | Verification Date | Expiration Date |
|------------|-------------|--------------|---------------|--------|------------------|-------------------|-----------------|
| 07/20/2004 | Amanda Fehr | 5.86         | 1000          | 0134-H | 5773.1566 dpm/mL | 07/25/2006        | 07/25/2007      |
| 12/20/2005 | Amanda Fehr | 5.5451       | 1000          | 0134-I | 5462.92 dpm/mL   | 12/20/2006        | 12/20/2007      |
| 07/11/2007 | Daniel Roy  | 5.5863       | 1000          | 0134-J | 5503.5128 dpm/ml | 07/29/2008        | 07/29/2009      |
| 03/25/2009 | Mary Aders  | 5.4917       | 1000          | 0134-K | 5410.3147 dpm/ml | 03/27/2009        | 03/27/2010      |

GEL Laboratories LLC

Version 1.0 9/18/2000

# Verification for H-3 Standard 0134-K

| M. Aders                | Isotope     | Detector CPM | BKG CPM    | NET CPM            | Detector Eff Mass. Used (mL) | Standard Source DPM/mL |
|-------------------------|-------------|--------------|------------|--------------------|------------------------------|------------------------|
| 4/9/2009                | 0134-K N1   | 1097.2000    | 54.0000    | 1043.2000          | 1.0000                       | 2741.3089              |
|                         | 0134-K N2   | 1073.2000    | 54.0000    | 1019.2000          | 0.380548                     | 2678.242955            |
|                         | 0134-K N3   | 1085.2000    | 54.0000    | 1031.2000          | 1.0000                       | 2709.776428            |
| Mean Value (Counting) = | 2709.776428 |              | 104.954429 | Pass               |                              | 2709.776428            |
| Stddev =                | 31.53347278 |              | 0.01163693 | Rule 3 (Pass/Fail) |                              |                        |

Certificate Value = 2581.86 dpm/mL  
 Lower Limit = 2846.709482 dpm/mL  
 Upper Limit = 2772.843373 dpm/mL  
 Rule 1 Pass/Fail Fail  
 Two sigma = 63.06894556 dpm/mL  
 10 % of Mean = 270.9776428 dpm/mL  
 Rule 2 (Pass/Fail) Pass

\*exception taken due to full recovery of standard

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for H-3 source 0134-K by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. Ten mL of Ecosint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ecosint Ultra liquid scintillation cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on Silver for H-3 source standard verification. The H-3 efficiency calibration which was used for verification calculations was performed on 4/9/09 using 0020-A (H-3). Calibration data is recorded in this logbook under H-3 0020. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

Handwritten signature: Amanda J. Fehr 4/9/09

1032

## CERTIFICATE OF CALIBRATION

### Standard Radionuclide Source

74047-278

5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytisc maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: October 1, 2006 12:00 EST

| ISOTOPE | GAMMA-RAY<br>ENERGY | HALF-LIFE | GAMMA-RAYS<br>PER SECOND | TOTAL<br>UNCERTAINTY<br>% |
|---------|---------------------|-----------|--------------------------|---------------------------|
| Am-241  | 59.5                | 432 y     | 3339                     | 3.0                       |
| Cd-109  | 88                  | 462.6 d   | 4815                     | 3.3                       |
| Co-57   | 122                 | 271.79 d  | 2409                     | 3.0                       |
| Ce-139  | 166                 | 137.6 d   | 3408                     | 2.8                       |
| Hg-203  | 279                 | 46.61 d   | 7522                     | 2.7                       |
| Sn-113  | 392                 | 115.1 d   | 4728                     | 2.6                       |
| Cs-137  | 662                 | 30.07 y   | 2973                     | 3.0                       |
| Y-88    | 898                 | 106.6 d   | 11600                    | 2.6                       |
| Co-60   | 1173                | 5.2714 y  | 5780                     | 2.7                       |
| Co-60   | 1332                | 5.2714 y  | 5783                     | 2.6                       |
| Y-88    | 1836                | 106.6 d   | 12260                    | 2.6                       |

5.31725 grams 4M HCl solution.  
 P O NUMBER 2734RD, Item 1

SOURCE PREPARED BY:

M. Dimitrova  
 M. Dimitrova, Radiochemist

Q A APPROVED:

W.M. [Signature] 11-28-06

This standard will expire one year after the calibration date.

rec'd 11/3/06  
 RC-S-045-073-0

1380 Seaboard Industrial Blvd.  
 Atlanta, Georgia 30318

Tel 404-352-8677

Fax 404-352-2837

www.analytiscinc.com

## ANALYSIS OF UNCERTAINTY FOR MIXED GAMMA STANDARDS BATCH 127

### CALIBRATION DATE: October 1, 2006 12:00 EST

| Isotope | Energy (keV) | Calibration Method <sup>1</sup> | Statistics <sup>2</sup> | Calibration <sup>2</sup> | Peak Fitting <sup>2</sup> | Geometry <sup>2</sup> | Impurities <sup>2</sup> | Weighing | Combined Standard Uncertainty | Relative Expanded Uncertainty (k=2) |
|---------|--------------|---------------------------------|-------------------------|--------------------------|---------------------------|-----------------------|-------------------------|----------|-------------------------------|-------------------------------------|
| Cd-109  | 88           | HPGe                            | 0.16                    | 1.1                      | 0.88                      | 0.8                   | 0                       | 0.2      | 1.64                          | 3.3                                 |
| Co-57   | 122          | HPGe                            | 0.23                    | 1.1                      | 0.71                      | 0.7                   | 0                       | 0.2      | 1.52                          | 3.0                                 |
| Ce-139  | 166          | HPGe                            | 0.17                    | 1.0                      | 0.58                      | 0.7                   | 0                       | 0.2      | 1.38                          | 2.8                                 |
| Hg-203  | 279          | HPGe                            | 0.11                    | 1.1                      | 0.34                      | 0.7                   | 0                       | 0.2      | 1.37                          | 2.7                                 |
| Sn-113  | 392          | HPGe                            | 0.21                    | 1.0                      | 0.35                      | 0.7                   | 0                       | 0.2      | 1.30                          | 2.6                                 |
| Cs-137  | 662          | HPGe                            | 0.36                    | 1.1                      | 0.60                      | 0.7                   | 0                       | 0.2      | 1.49                          | 3.0                                 |
| Y-88    | 898          | HPGe                            | 0.19                    | 1.0                      | 0.33                      | 0.7                   | 0                       | 0.2      | 1.29                          | 2.6                                 |
| Co-60   | 1173         | HPGe                            | 0.31                    | .97                      | 0.45                      | 0.7                   | 0                       | 0.2      | 1.33                          | 2.7                                 |
| Co-60   | 1332         | HPGe                            | 0.33                    | .93                      | 0.48                      | 0.7                   | 0                       | 0.2      | 1.32                          | 2.6                                 |
| Y-88    | 1836         | HPGe                            | 0.24                    | 1.0                      | 0.35                      | 0.7                   | 0                       | 0.2      | 1.31                          | 2.6                                 |

#### Optional Additional Isotopes

|        |      |       |      |     |   |     |      |     |      |     |
|--------|------|-------|------|-----|---|-----|------|-----|------|-----|
| Pb-210 | 46.5 | 4π LS | 0.33 | 1.1 | 0 | 0.9 | 0.30 | 0.2 | 1.50 | 3.0 |
| Am-241 | 59.5 | 4π LS | 0.33 | 1.1 | 0 | 0.9 | 0.30 | 0.2 | 1.50 | 3.0 |
| Sr-85  | 514  | IC    | 0.30 | 1.1 | 0 | 0.7 | 0.17 | 0.2 | 1.36 | 2.7 |
| Cs-134 | 605  | IC    | 0.30 | 1.0 | 0 | 0.8 | 0.17 | 0.2 | 1.34 | 2.7 |
| Cs-134 | 796  | IC    | 0.30 | 1.0 | 0 | 0.8 | 0.17 | 0.2 | 1.34 | 2.7 |
| Mn-54  | 835  | IC    | 0.30 | 1.0 | 0 | 0.8 | 0.17 | 0.2 | 1.34 | 2.7 |
| Zn-65  | 1116 | IC    | 0.30 | 1.0 | 0 | 0.8 | 0.17 | 0.2 | 1.34 | 2.7 |

#### Calibration Methods:

4π LS (4 pi Liquid Scintillation Counting)

HPGe (High Purity Germanium Gamma Ray Spectrometer)

IC (Gamma Ray Ionization Chamber)

<sup>2</sup>As Percent (%) from counting data

No interfering gamma emitting impurities were detected during calibration. Depending on the resolution and energy dispersion (keV/channel) of the measuring system, the following spectral conflicts may occur: (1) between the 88 keV gamma-ray and the X-rays emitted in the decay of Hg-203, (2) between the 1333 keV gamma-ray and the 1325 keV single escape peak from the 1836 keV gamma-ray.

# Standard Traceability Log Rad

| Source Material Info |              | A Solution Material Info |             |
|----------------------|--------------|--------------------------|-------------|
| Parent Code:         | 1032         | Isotope:                 | Mixed Gamma |
| Prepared By:         | Daniel Roy   | Prepared By:             | Daniel Roy  |
| Carrier Conc:        | 4 M HCL      | Prep Date:               | 11/30/2006  |
| Reference Date:      | 10/01/2006   | Verification Date:       | 12/02/2009  |
| Ampoule Mass (g):    | 5.31725 g    | Expiration Date:         | 12/02/2010  |
| Uncertainty:         | +/- 2.81 %   | Primary Code:            | 1032-A      |
| LogBook No:          | RC-S-045-073 | Dilution(mL):            | 100 mL      |
|                      |              | Mass of Parent(g):       | 5.2579 g    |
|                      |              | Density(g/mL):           | 1.0611      |
|                      |              | Balance ID:              | 38080204    |

## Calculations Converting parent activity to dpm/mL|dpm/g

|  |
|--|
| $(\text{Mass of parent(g)}) * (\text{Parm Activity (dpm)}) * (\text{conversion dpm to dpm}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$                  |
| $(\text{Mass of parent(g)}) * (\text{Parm Activity (dpm)}) * (\text{conversion dpm to dpm}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$ |
| $(5.2579 \text{ g}) * (218817 \text{ dpm}) * (1 \text{ dpm/dpm}) / (5.31725 \text{ g} * 100 \text{ mL}) = 2163.7461 \text{ dpm/mL}$  |
| $(5.2579 \text{ g}) * (218817 \text{ dpm}) * (1 \text{ dpm/dpm}) / (1.0611 \text{ g/mL}) / (5.31725 \text{ g} * 100 \text{ mL}) = 2039.2400 \text{ dpm/g}$   |

## Secondary Standards

| Prep Date | Preparer | Mass Primary | Dilution (mL) | Code | Conc dpm/mL | Verification Date | Expiration Date |
|-----------|----------|--------------|---------------|------|-------------|-------------------|-----------------|
|-----------|----------|--------------|---------------|------|-------------|-------------------|-----------------|

GEL Laboratories LLC  
Version 1.0 9/18/2000

# Verification for Mixed Gamma Standard 1032-A

M. Stamps  
12/2/2009

Am-241

| Isotope        | Result | pCi/L - Var. Std. 1 |
|----------------|--------|---------------------|
| Mixed Gamma N1 | 2534   | pCi/L               |
| Mixed Gamma N2 | 2510   | pCi/L               |
| Mixed Gamma N3 | 2413   | pCi/L               |

Mean Value (Counting) = 2485.67 Pass  
Stdev = 64.065 Rule 3 (Pass/Fail)

Certificate Value = 2485.68018 pCi/L  
Lower Limit = 2357.536524 pCi/L  
Upper Limit = 2613.796809 pCi/L  
Rule 1 (Pass/Fail) Pass  
Two sigma = 128.1301422  
10 % of Mean = 248.56666667  
Rule 2 (Pass/Fail) Pass

M. Stamps  
12/2/09  
independent  
12/2/09

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

# Verification for Mixed Gamma Standard 1032-A

M. Stamps  
12/2/2009

| Cs-137 | Isotope        |  | Result |
|--------|----------------|--|--------|
|        | Mixed Gamma N1 |  |        |
|        | Mixed Gamma N2 |  |        |
|        | Mixed Gamma N3 |  |        |

pCi/L - VER. TAR-1  
pCi/L - VER. TAR-3  
pCi/L - VER. TAR-2

Mean Value (Counting) =  
Stdev =

886.90  
28.651

95.01

Rule 3 (Pass/Fail)

Certificate Value =  
Lower Limit =  
Upper Limit =  
Rule 1 (Pass/Fail)  
Two sigma =  
10 % of Mean =  
Rule 2 (Pass/Fail)

933.44144  
829.597644  
944.202356  
Pass  
57.30235597  
88.69000000  
Pass

pCi/L  
pCi/L  
pCi/L

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

*Handwritten:*  
12/2/09  
12/2/09  
12/2/09

# Verification for Mixed Gamma Standard 1032-A

M. Stamps  
12/2/2009

Co-60 (1332.5)

| Isotope        | Result | pCi/L - Ver-Jae-5 |
|----------------|--------|-------------------|
| Mixed Gamma N1 | 1572   | pCi/L - Ver-Jae-2 |
| Mixed Gamma N2 | 1495   | pCi/L - Ver-Jae-3 |
| Mixed Gamma N3 | 1501   |                   |

Mean Value (Counting) = 1522.67 Pass  
Stdev = 42.829 Rule 3 (Pass/Fail)

Certificate Value = 1545.8378  
Lower Limit = 1437.008431  
Upper Limit = 1608.324902  
Rule 1 (Pass/Fail) Pass  
Two sigma = 85.65823564  
10 % of Mean = 152.26666667  
Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

*U.S. Stamp issued 12/2/09*



# 0244-A Characterization

| Sample #         | Uranium-233/234<br>Result (pCi/g) | Uranium-238<br>Result (pCi/g) | Thorium-230<br>Result (pCi/g) |
|------------------|-----------------------------------|-------------------------------|-------------------------------|
| 0244-A 1         | 6.59                              | 6.12                          | 25.3                          |
| 0244-A 2         | 6.36                              | 6.07                          | 28.5                          |
| 0244-A 3         | 5.78                              | 5.53                          | 26.5                          |
| 0244-A 4         | 6.48                              | 5.97                          | 25.5                          |
| 0244-A 5         | 5.65                              | 5.59                          | 26.2                          |
| 0244-A 6         | 6.96                              | 5.78                          | 27.0                          |
| 0244-A 7         | 5.95                              | 5.75                          | 24.2                          |
| 0244-A 8         | 5.29                              | 5.67                          | 27.2                          |
| 0244-A 9         | 5.51                              | 6.05                          | 24.3                          |
| 0244-A 10        | 6.37                              | 5.57                          | 25.6                          |
| 0244-A 11        | 6.50                              | 5.80                          | 25.8                          |
| 0244-A 12        | 6.13                              | 5.42                          | 22.4                          |
| 0244-A 13        | 5.49                              | 5.24                          | 24.7                          |
| 0244-A 14        | 6.19                              | 5.21                          | 26.9                          |
| 0244-A 15        | 6.50                              | 6.27                          | 27.6                          |
| 0244-A 16        | 6.50                              | 5.24                          | 24.9                          |
| 0244-A 17        | 6.25                              | 6.05                          | 24.7                          |
| 0244-A 18        | 6.14                              | 6.00                          | 25.4                          |
| 0244-A 19        | 6.19                              | 6.14                          | 26.4                          |
| 0244-A 20        | 5.67                              | 5.61                          | 23.2                          |
| Mean Value       | 6.13                              | 5.75                          | 25.62                         |
| 1 sigma          | 0.439                             | 0.325                         | 1.493                         |
| 2 sigma          | 0.878                             | 0.650                         | 2.986                         |
| 75% Limit        | 4.60                              | 4.31                          | 19.22                         |
| 125% Limit       | 7.66                              | 7.19                          | 32.03                         |
| Expected Result  | 6.2 +/- 4.0                       | 6.0 +/- 4.0                   | 24.5 +/- 0.6                  |
| Achieved Results | 6.13 +/- 0.439                    | 5.75 +/- 0.325                | 25.62 +/- 1.493               |

REFERENCE DATE 4/14/2000 *fitt c held 12/1/04*

*angela d. johnson 12/13/04*

TRM

Invoice:

5 boxes of TRM-1  
 10 " " TRM-2 and 3  
 5 " each of NRM-1 & 2 & 3 & 4 & 5 & 6  
 7 " baghouse dirt

Use 1/4 gm x 10 Samples WITH Together  
 for TRM-2

Table 7. Recommended Concentrations of Tailings Reference Materials (pCi/g)

|        | TRM-1    | TRM-2      | TRM-3      | TRM-4      |
|--------|----------|------------|------------|------------|
| U-238  | 99 ± 6   | 6.0 ± 4.0  | 19.6 ± 1.4 | 44.9 ± 1.6 |
| U-234  | 105 ± 6  | 6.2 ± 4.0  | 19.6 ± 1.9 | 44.6 ± 1.2 |
| Tn-230 | 471 ± 11 | 24.5 ± 0.6 | 58.5 ± 2.1 | 44.0 ± 1.6 |
| Ra-225 | 489 ± 17 | 25.4 ± 0.9 | 60.3 ± 2.3 | 42.9 ± 1.2 |
| Pb-210 | 625 ± 24 | 22.1 ± 1.2 | 56.0 ± 2.1 | 38.9 ± 2.0 |

Attention Nancy Slater At GEL  
Not for Log-In

9911627-01-20

SF 2001-COC (10-97)

Internal Lab  
Batch No.

SARWR No. N/A

Press F1 for instructions for each field.

AR/COC-

Page 1 of 1

602945

|   |  |   |             |
|---|--|---|-------------|
| Dept. No./Mail Stop: 7132 / 1042  |  | Contract No.: AJ-2480A  |             |
| Project/Task Manager: PAM PUISSANT  |  | Case No.: 10204 13  |             |
| Project Name:   |  | SMO Authorization: <i>[Signature]</i>   |             |
| Record Center Code: N/A   |  | Bill to: Sandia National Laboratories   |             |
| Logbook Ref. No.: N/A   |  | Supplier Services, Dept.  |             |
| Service Order No.:  |  | P.O. Box 5800 MS 0154   |             |
| Location  |  | Reference LOV (available at SMO)  |             |
| Building N/A  | Tech Area VI                           | Container   | Sample Type |
| Sample No. - Fraction   | ER Sample ID or Sample Location Detail | Type  | Volume      |
| 050484 - 001  | PEM-1                                  | P   | 1 L         |
| 050485 - 001  | TRM-2                                  | G   | 1 L         |
| 050486 - 001  | ARM-2 NBRH                             | G   | 1 L         |
| -   |  |   |             |
| -   |  |   |             |
| -   |  |   |             |
| -   |  |   |             |
| -   |  |   |             |
| -   |  |   |             |
| -   |  |   |             |
| RMMA <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Ref. No.                             |  | Special Instructions/QC Requirements  |             |
| Sample Disposal <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by lab |  | EDD <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                               |             |
| Turnaround Time <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Rush Required Report Date |  | Raw data package <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                  |             |
| Sample Team   |  | These "samples" are going to be used for the GEL and are being sent to GEL for backup of Hach Histac- |             |
| Members   |  | Please list as separate report.   |             |
| 1. Relinquished by <i>[Signature]</i> Date 11-16-98 Time 0900   |  | Date  |             |
| 1. Received by Org. Date  |  | Date  |             |
| 2. Relinquished by Org. Date  |  | Date  |             |
| 2. Received by Org. Date  |  | Date  |             |
| 3. Relinquished by Org. Date  |  | Date  |             |
| 3. Received by Org. Date  |  | Date  |             |

Original To Accompany Samples, Laboratory Copy (White)

1<sup>st</sup> Copy To Accompany Samples, Return to SMO (Blue)

2<sup>nd</sup> Copy SMO Suspense Copy (Yellow)

3<sup>rd</sup> Copy Field Copy (Pink)

### 0244-B Characterization

| Sample #         | Plutonium-239<br>Result (pCi/g) | Plutonium-238<br>Result (pCi/g) | Americium-241<br>Result (pCi/g) |
|------------------|---------------------------------|---------------------------------|---------------------------------|
| 0244-B 1         | 39.9                            | 7.88                            | 38.4                            |
| 0244-B 2         | 44.1                            | 7.97                            | 40.6                            |
| 0244-B 3         | 45.8                            | 6.56                            | 31.8                            |
| 0244-B 4         | 43.6                            | 7.69                            | 31.5                            |
| 0244-B 5         | 43                              | 7.9                             | 40.2                            |
| 0244-B 6         | 43.5                            | 7.84                            | 29.4                            |
| 0244-B 7         | 41.3                            | 7.67                            | 36                              |
| 0244-B 8         | 44.3                            | 6.95                            | 33.2                            |
| 0244-B 9         | 42.7                            | 7.2                             | 29.2                            |
| 0244-B 10        | 44.9                            | 7.69                            | 30                              |
| 0244-B 11        | 41.4                            | 7.22                            | 30.2                            |
| 0244-B 12        | 41.3                            | 7.74                            | 36                              |
| 0244-B 13        | 39.2                            | 6.65                            | 33.8                            |
| 0244-B 14        | 39.6                            | 7.78                            | 31.1                            |
| 0244-B 15        | 45.3                            | 8.41                            | 37.3                            |
| 0244-B 16        | 38.1                            | 6.74                            | 33.6                            |
| 0244-B 17        | 48.5                            | 8.51                            | 30.5                            |
| 0244-B 18        | 36.5                            | 7.23                            | 38.6                            |
| 0244-B 19        | 35.3                            | 6.98                            | 30.9                            |
| 0244-B 20        | 37.4                            | 8.55                            | 31.3                            |
| Mean Value       | 41.79                           | 7.56                            | 33.68                           |
| 1 sigma          | 3.418                           | 0.596                           | 3.724                           |
| 2 sigma          | 6.835                           | 1.193                           | 7.448                           |
| 75% Limit        | 30.75                           | 6.02                            | 24.38                           |
| 125% Limit       | 51.25                           | 10.04                           | 40.63                           |
| Expected Result  | 41.0 +/- 3.0                    | 8.03 +/- 0.37                   | 32.5 +/- 1.1                    |
| Achieved Results | 41.79 +/- 3.418                 | 7.56 +/- .596                   | 33.68 +/- 3.724                 |

REFERENCE DATA 4/14/2000

Amanda L. Lehn 4/30/04  
 Lott & Staley 5/1/04

## PREPARATION AND CHARACTERIZATION OF THE PERFORMANCE EVALUATION SOIL SAMPLE PEM-1

### INTRODUCTION

Rust Geotech (Rust) was contracted by Los Alamos National Laboratory (LANL) to prepare and characterize a soil performance evaluation sample designated PEM-1. This report describes sample preparation, homogeneity assessment, and determination of the concentrations of 28 elements and radioactive isotopes in the sample.

### SAMPLE PREPARATION

Rust received nine five-gallon buckets of soil from LANL. The soils were dried overnight in ovens at 103 °C. The large pieces of leaves and sticks were removed and the soils were ground with ceramic-plate grinders to a particle size that passed through a 325 mesh screen. The samples were blended at the proportions specified by LANL for 48 hours in a 3-cubic-foot cross-flow blender. The sample identifications and the amounts used are listed in Table 1.

Table 1. Sample Identifications and Amounts Used to Prepare PEM-1

| LANL Sample ID | Amount Used (kg) |
|----------------|------------------|
| AAA 1592       | 1.7              |
| AAA 2505-1     | 10.9             |
| AAA 2505-2     | 12.8             |
| AAA 2750-1     | 8.4              |
| AAA 2750-2     | 8.4              |
| AAA 3205       | 12.6             |
| AAA 8581       | 4.2              |
| AAB 3417       | 12.8             |
| AAB 3475       | 12.6             |

The blended sample was transferred to three five-gallon plastic containers. While the sample was being transferred, 10 samples were taken at pre-determined time intervals to be used for homogeneity assessment and sample characterization. These samples are believed to be representative of the bulk material.



# CERTIFICATE OF CALIBRATION

## ALPHA STANDARD SOLUTION

|              |                     |                          |                           |
|--------------|---------------------|--------------------------|---------------------------|
| Radionuclide | Am-243              | Customer:                | GENERAL ENGINEERING LABS  |
| Half Life:   | 7380 $\pm$ 40 years | P.O.No.:                 | 9290-RAD                  |
| Catalog No.: | 7243                | Reference Date:          | January 1 1994 12:00 PST. |
| Source No.:  | 445-96-2            | Contained Radioactivity: | (Am-243) 101.2 $\mu$ Ci   |
|              |                     | Contained Radioactivity: | (Am-243) 3750 kBq         |

### Description of Solution

|                      |  |
|----------------------|--|
| a. Mass of solution: | 5.3739 g (in a 5 ml Flame Sealed Ampoule)                |
| b. Chemical form:    | Am(NO <sub>3</sub> ) <sub>3</sub> in 2N HNO <sub>3</sub> |
| c. Carrier content:  | None added   |
| d. Density:          | 1.0651 g/ml @ 20°C.                                      |

**Radioimpurities** None detected

### Radioactive Daughters

Np-239 (beta active) in equilibrium

### Radionuclide Concentration

(Am-243) 18.84  $\mu$ Ci/g

### Method of Calibration

Weighed aliquots of the solution were assayed using gamma spectrometry for Np-239:

|                                   |               |                       |
|-----------------------------------|---------------|-----------------------|
| Energy peak(s) intergrated under: | 228, 278      | keV.                  |
| Branching ratio(s) used:          | 0.108, 0.1420 | gamma rays per decay. |

### Uncertainty of Measurement

|  |             |
|--|-------------|
| a. Systematic uncertainty in instrument calibration: | $\pm 3.0\%$ |
| b. Random uncertainty in assay:                      | $\pm 0.4\%$ |
| c. Random uncertainty in weighing(s):                | $\pm 0.0\%$ |
| d. Total uncertainty at the 99% confidence level:    | $\pm 3.0\%$ |

### NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

### Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

### Notes

1. Nuclear data were taken from "Table of Radioactive Isotopes", edited by Virginia S. Shirley, 1986.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).



**ISOTOPE PRODUCTS LABORATORIES**  
1800 North Keystone Street  
Burbank, California 91504  
(818) 843 - 7000

*Anna H. Khan*  
**QUALITY CONTROL**

*Jan 3, 1994*  
**Date Signed**

THE LEAK TEST(S) INDICATED BY THE CHECKED BOX(ES) WAS(WERE) APPLIED TO  
DETERMINE THE INTEGRITY OF THE SOURCE DESCRIBED ON THE FRONT SIDE

☒ 1. STANDARD WIPE TEST

The source is wiped over its entire surface with a moistened filter paper disk. After drying, the disk is checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha are cause for rejection of the source.

☐ 2. SOAK TEST

The source is immersed in distilled water and maintained at  $50 \pm 10^\circ \text{C}$  for a minimum of four hours. After removal of the source, the liquid is a) checked for activity using a liquid scintillation counter, or b) evaporated in a planchet and the residue is checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha are cause for rejection of the source.

☐ 3. SOAK TEST -- BERYLLIUM WINDOW

The source is immersed in distilled water and maintained at  $50 \pm 10^\circ \text{C}$  for 20 minutes. The entire surface of the source is then wiped with a moistened cotton swab or filter paper disk. After drying, the swab or disk is checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha are cause for rejection of the source.

☐ 4. GAS SOURCE TEST (Radioactive Gas)

The source is placed in a vacuum desiccator and maintained at a pressure of less than 1 mm Hg for not less than 12 hours. The activity is checked by introducing air into the desiccator and monitoring the air with an end-window G.M. tube. Activity levels exceeding 1000 cpm are cause for rejection of the source.

☒ 5. OTHER LEAK TEST

The ampoule is kept in an inverted position on a filter paper disk for a minimum of 16 hours. The filter paper disk is then checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha are cause for rejection of the source.

☐ 6. LEAK TEST NOT APPLICABLE

The active area of this source is uncovered or is protected by a very thin coating. Although the deposit is adherent, it is not designed or certified to pass a standard leak test. The inactive portions of the source have been checked using the standard wipe test. Levels of removable activity did not exceed 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha at the time of shipment.



# Standard Traceability Log Rad

| Source Material Info |              | A Solution Material Info |                |
|----------------------|--------------|--------------------------|----------------|
| Parent Code:         | 445-96-2     | Isotope:                 | Americium-243  |
| Prepared By:         | Genie Bost   | Prepared By:             | Angela Johnson |
| Carrier Conc:        | 2M HNO3      | Prep Date:               | 01/05/1994     |
| Reference Date:      | 01/01/1994   | Verification Date:       | 05/11/2009     |
| Ampoule Mass (g):    | 5.3739 g     | Expiration Date:         | 05/11/2010     |
| Uncertainty:         | +/- 3 %      | Primary Code:            | 445-96-2-A     |
| LogBook No:          | RC S 005 032 | Dilution(mL):            | 100 mL         |
|                      |              | Mass of Parent(g):       | 5.3419 g       |
|                      |              | Density(g/mL):           | 1.0785         |
|                      |              | Balance ID:              | 38080204       |

## Calculations Converting parent activity to dpm/mL/dpm/g

|   |
|---|
| $(\text{Mass of parent(g)}) * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$                        |
| $(\text{Mass of parent(g)}) * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$ |
| $(5.3419 \text{ g}) * (18.84 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) = 2234238.9912 \text{ dpm/mL}$   |
| $(5.3419 \text{ g}) * (18.84 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (1.0785 \text{ g/mL}) / (100 \text{ mL}) = 2071617.0528 \text{ dpm/g}$                                |

## Secondary Standards

| Prep Date  | Preparer       | Mass Primary | Dilution (mL) | Code        | Conc dpm/mL     | Verification Date | Expiration Date |
|------------|----------------|--------------|---------------|-------------|-----------------|-------------------|-----------------|
| 01/05/1994 | Genie Bost     | .0058        | 100           | 445-96-2-B  | 120.1 dpm/ml    | 01/05/1995        | 01/05/1996      |
| 09/10/2004 | Amanda Fehr    | .0325        | 1000          | 445-96-2-BB | 67.328 dpm/mL   | 09/10/2005        | 09/10/2006      |
| 01/05/1994 | Genie Bost     | .0025        | 100           | 445-96-2-C  | 51.77 dpm/ml    | 01/05/1995        | 01/05/1996      |
| 05/27/2005 | Brenda Burke   | .000246      | 100           | 445-96-2-CC | 5.10613 dpm/mL  | 05/31/2005        | 05/31/2006      |
| 03/25/1994 | Genie Bost     | .0064        | 100           | 445-96-2-D  | 132.53 dpm/ml   | 01/05/1995        | 01/05/1996      |
| 08/16/2005 | Brenda Burke   | .001224      | 500           | 445-96-2-DD | 5.07144 dpm/mL  | 08/18/2007        | 08/18/2008      |
| 08/04/1994 | Genie Bost     | .0094        | 100           | 445-96-2-E  | 194.65 dpm/ml   | 01/05/1995        | 01/05/1996      |
| 10/13/2005 | Brenda Burke   | .0017        | 500           | 445-96-2-EE | 7.0435 dpm/mL   | 11/15/2005        | 11/15/2006      |
| 08/04/1994 | Genie Bost     | .0046        | 100           | 445-96-2-F  | 95.25 dpm/ml    | 01/05/1995        | 01/05/1996      |
| 10/14/2005 | Mary Aders     | .0141        | 500           | 445-96-2-FF | 58.4196 dpm/mL  | 10/14/2005        | 10/14/2006      |
| 09/01/1994 | Genie Bost     | .0031        | 100           | 445-96-2-G  | 64.19 dpm/ml    | 01/05/1995        | 01/05/1996      |
| 05/10/2006 | Mary Aders     | 2.0753       | 1000          | 445-96-2-GG | 4299.227 dpm/mL | 09/30/2008        | 09/30/2009      |
| 10/17/1994 | Genie Bost     | .0969        | 100           | 445-96-2-H  | 2006.52 dpm/ml  | 01/05/1995        | 01/05/1996      |
| 06/07/2006 | Mary Aders     | .0365        | 1000          | 445-96-2-HH | 75.614 dpm/mL   | 06/19/2006        | 06/19/2007      |
| 02/06/1995 | Genie Bost     | .0043        | 100           | 445-96-2-I  | 89.04 dpm/ml    | 01/05/1995        | 01/05/1996      |
| 05/11/2006 | Brenda Burke   | .000009739   | 100           | 445-96-2-II | .201761 dpm/mL  | 07/26/2006        | 07/26/2007      |
| 07/20/1995 | Theresa Austin | .0041        | 100           | 445-96-2-J  | 84.9 dpm/ml     | 01/05/1995        | 01/05/1996      |
| 05/01/2007 | Daniel Roy     | .0352        | 1000          | 445-96-2-JJ | 72.9209 dpm/ml  | 04/30/2008        | 04/30/2009      |
| 08/10/1995 | Garret Ray     | .0952        | 100           | 445-96-2-K  | 1971.32 dpm/ml  | 01/05/1995        | 01/05/1996      |
| 06/12/2007 | Julie Strock   | .01038       | 250           | 445-96-2-KK | 22.1496 dpm/mL  | 05/28/2008        | 05/28/2009      |

|            |                 |           |      |                |                 |            |            |
|------------|-----------------|-----------|------|----------------|-----------------|------------|------------|
| 09/11/1995 | Theresa Austin  | 1.0525    | 100  | 445-96-2-L     | 21794.23 dpm/ml | 01/05/1995 | 01/05/1996 |
| 09/11/1995 | Theresa Austin  | .5107     | 100  | 445-96-2-L-1   | 111.3 dpm/ml    | 01/05/1995 | 01/05/1996 |
| 04/28/1998 | Richard Kinney  | .1264     | 100  | 445-96-2-M     | 2617.4 dpm/ml   | 04/28/1998 | 04/28/1999 |
| 11/01/2007 | Eric Williamson | .001274   | 500  | 445-96-2-MM    | 5.27945 dpm/mL  | 04/06/2008 | 04/06/2010 |
| 10/12/1998 | Gregory Smith   | .1348     | 100  | 445-96-2-N     | 2791.32 dpm/mL  | 01/05/1995 | 01/05/1996 |
| 01/25/1999 | Gregory Smith   | 1.9382    | 100  | 445-96-2-N-1   | 50.16 dpm/ml    | 01/05/1995 | 01/05/1996 |
| 04/19/2008 | Daniel Roy      | .0424     | 1000 | 445-96-2-NN    | 87.8366 dpm/ml  | 04/16/2009 | 04/16/2010 |
| 04/21/1999 | Greg Smith      | .1645     | 100  | 445-96-2-O     | 3406.32 dpm/mL  | 04/21/1999 | 04/21/2000 |
| 07/27/1999 | Gregory Smith   | 1.567     | 100  | 445-96-2-O-2   | 50.56 dpm/ml    | 05/13/1999 | 05/13/2000 |
| 10/12/1999 | Richard Kinney  | 1.5589    | 100  | 445-96-2-O-3   | 50.31 dpm/mL    | 05/13/1999 | 05/13/2000 |
| 04/21/1999 | Greg Smith      | 1.5309    | 100  | 445-96-2-O-1   | 49.4 dpm/mL     | 04/21/1999 | 04/21/2000 |
| 11/10/1999 | Joe Davis       | .1809     | 100  | 445-96-2-P     | 3745.92 dpm/mL  | 05/13/1999 | 05/13/2000 |
| 01/04/2008 | Julie Strock    | .00001005 | 100  | 445-96-2-PP    | .20819 dpm/mL   | 12/29/2008 | 12/29/2009 |
| 01/28/2000 | Angela Johnson  | .0354     | 1000 | 445-96-2-Q     | 73.3 dpm/mL     | 02/08/2001 | 02/08/2002 |
| 09/29/2008 | Julie Strock    | .0025219  | 250  | 445-96-2-QQ    | 20.8977 dpm/mL  | 09/30/2008 | 09/29/2009 |
| 04/18/2000 | Robert Timm     | .429      | 250  | 445-96-2-R     | 3553.34 dpm/mL  | 04/18/2000 | 04/18/2001 |
| 04/23/2009 | Tina Schoneman  | .001251   | 500  | 445-96-2-RR    | 4.8075 dpm/mL   | 04/23/2009 | 04/23/2010 |
| 04/13/2001 | Angela Johnson  | .1869     | 100  | 445-96-2-S     | 3870.16 dpm/mL  | 04/13/2001 | 04/13/2002 |
| 05/08/2009 | Mary Aders      | .0141     | 1000 | 445-96-2-SS    | 29.2098 dpm/ml  | 05/11/2009 | 05/11/2010 |
| 07/03/2001 | Lonnie Morris   | 2.0057    | 1000 | 445-96-2-T-103 | 4153.225 dpm/mL | 07/03/2002 | 07/03/2003 |
| 07/03/2001 | Lonnie Morris   | 2.0057    | 1000 | 445-96-2-T-203 | 4153.225 dpm/mL | 07/03/2002 | 07/03/2003 |

|            |                 |           |      |                |                  |            |            |
|------------|-----------------|-----------|------|----------------|------------------|------------|------------|
| 07/03/2001 | Lonnie Morris   | 2.0057    | 1000 | 445-96-2-T-303 | 4153.225 dpm/mL  | 07/03/2002 | 07/03/2003 |
| 06/03/2009 | Julie Strock    | .00000927 | 100  | 445-96-2-TT    | .1923 dpm/mL     | 06/05/2009 | 06/03/2010 |
| 08/23/2001 | Angela Johnson  | .0194     | 500  | 445-96-2-U-103 | 80.34 dpm/mL     | 08/23/2001 | 08/23/2002 |
| 08/23/2001 | Angela Johnson  | .0194     | 500  | 445-96-2-U-203 | 80.34 dpm/mL     | 08/23/2001 | 08/23/2002 |
| 08/23/2001 | Angela Johnson  | .0194     | 500  | 445-96-2-U-303 | 80.34 dpm/ml     | 08/23/2001 | 08/23/2002 |
| 06/02/2009 | Mary Aders      | 2.1177    | 1000 | 445-96-2-UU    | 4385.1449 dpm/ml | 06/04/2009 | 06/04/2010 |
| 08/27/2001 | Angela Johnson  | .0394     | 1000 | 445-96-2-V-103 | 81.586 dpm/mL    | 08/27/2002 | 08/27/2003 |
| 08/27/2001 | Angela Johnson  | .0394     | 1000 | 445-96-2-V-203 | 81.586 dpm/mL    | 08/27/2002 | 08/27/2003 |
| 08/27/2001 | Angela Johnson  | .0394     | 1000 | 445-96-2-V-303 | 81.586 dpm/mL    | 08/27/2002 | 08/27/2003 |
| 03/17/2003 | Angela Johnson  | 2.1108    | 1000 | 445-96-2-W     | 4370.857 dpm/mL  | 03/14/2006 | 03/14/2007 |
| 04/14/2003 | Lonnie Morris   | .0315     | 1000 | 445-96-2-X     | 65.2559 dpm/mL   | 04/14/2004 | 04/14/2005 |
| 05/03/2003 | Tim Chandler    | .0103     | 1000 | 445-96-2-Y     | 21.3376 dpm/mL   | 05/05/2003 | 05/05/2004 |
| 05/05/2003 | Eric Williamson | .011      | 1000 | 445-96-2-Z     | 22.7877 dpm/mL   | 04/03/2007 | 04/03/2008 |

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## Verification for Am-243 Standard 445-96-2-SS

|                         |                |        |                    |
|-------------------------|----------------|--------|--------------------|
| M. Aders<br>5/15/2009   | Isotope        | Value  | Uncertainty        |
|                         | 445-96-2-SS #1 | 1.360  | 0.1690             |
|                         | 445-96-2-SS #2 | 1.370  | 0.1690             |
|                         | 445-96-2-SS #3 | 1.290  | 0.1590             |
| Mean Value (Counting) = | 1.340          | 101.99 | Pass               |
| Stdev =                 | 0.043588989    |        | Rule 3 (Pass/Fail) |
| Target =                | 1.314          |        |                    |
| Lower Limit =           | 1.252822021    |        |                    |
| Upper Limit =           | 1.427177979    |        |                    |
| Rule 1 Pass/Fail        | Pass           |        |                    |
| Two sigma =             | 0.087177979    |        |                    |
| 10 % of Mean =          | 0.134          |        |                    |
| Rule 2 (Pass/Fail)      | Pass           |        |                    |

The analyst prepared three standard verification sources for standard 445-96-2-SS using 0.1 mL for each source. Each standard was combined with 0.1 mL of *Cm-244* standard 0533-O and 50 micrograms of neodymium carrier in a disposable centrifuge tube. Each standard was diluted with 4 mL of 2 M HCl and 6 mL of DI Water. Two mL of 48% HF was added to precipitate Nd (and Americium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Am-243 were calculated by comparison to Am-241 certified values.

Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements

Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule 3 = The determined mean value shall be within 5% of the certificate value.

*M. Aders* 5/15/09  
*Taheri*  
007509



NATIONAL PHYSICAL LABORATORY

Teddington Middlesex UK TW11 0LW Telephone +44 20 8977 3222

# Certificate of Calibration



0478

PLUTONIUM-236 SOLUTION

R37-02

*This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.*

FOR: GEL Laboratories LLC  
2040 Savage Road  
Charleston, SC 29407  
USA

FOR THE ATTENTION OF: Mr Tim Winters

NPL PRODUCT CODE: R37-02

IDENTIFICATION: A09881

DESCRIPTION: An aqueous solution of  $^{236}\text{Pu}$  also containing  $2 \text{ mol dm}^{-3}$  of nitric acid. The solution is contained in a flame sealed ampoule of type Q and nominal volume 5 ml (squat) as defined in BS 795:1983.

DATE(S) OF CALIBRATION: 26 June 2009 to 1 July 2009

INTENDED USE: Calibration of instruments for response to  $^{236}\text{Pu}$

STORAGE: The material may be stored at room temperature in a suitably sealed container. Flame-sealed glass ampoules are recommended for long-term storage. Regulatory conditions may apply to the manner in which this material is stored.

## MEASUREMENTS

The samples were prepared by gravimetric dilution of a  $^{236}\text{Pu}$  solution, which had been previously standardised using liquid scintillation counting. The accuracy of the dilution factor was checked using liquid scintillation counting.

Reference: 2009100356

Date of Issue: 4 November 2009

Checked by: *Ch Ali*  
Page 549 of 562

Signed: *Arvic Harms*

Name: Dr Arvic Harms

Page 1 of 3

(Authorised Signatory)

for Managing Director

## RESULTS

|   |   |
|---|---|
| Principal radionuclide:                           | $^{236}\text{Pu}$   |
| Reference time:                                   | 2009-07-01 12:00 UTC  |
| Activity concentration of principal radionuclide: | $170.8 \text{ Bq g}^{-1}$   |
| Expanded uncertainty:                             | $\pm 0.6 \text{ Bq g}^{-1} (\pm 0.36 \%)$                           |
| Contaminants present:                             | $^{226}\text{Ra}, ^{232}\text{U}, ^{228}\text{Th}, ^{237}\text{Np}$ |
| Activity concentration of $^{226}\text{Ra}$ :     | $11.0 \text{ mBq g}^{-1}$   |
| Expanded uncertainty:                             | $\pm 4.0 \text{ mBq g}^{-1} (\pm 36 \%)$                            |
| Activity concentration of $^{232}\text{U}$ :      | $0.67 \text{ Bq g}^{-1}$  |
| Expanded uncertainty:                             | $\pm 0.12 \text{ Bq g}^{-1} (\pm 18 \%)$                            |
| Activity concentration of $^{228}\text{Th}$ :     | $11.38 \text{ mBq g}^{-1}$  |
| Expanded uncertainty:                             | $\pm 0.46 \text{ mBq g}^{-1} (\pm 4 \%)$                            |
| Activity concentration of $^{237}\text{Np}$ :     | $5.00 \text{ mBq g}^{-1}$   |
| Expanded uncertainty:                             | $\pm 0.34 \text{ mBq g}^{-1} (\pm 8 \%)$                            |
| Sample Mass:                                      | $4.97 \text{ g} \pm 0.02 \text{ g}$                                 |

## UNCERTAINTIES

The reported uncertainties are based on standard uncertainties multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95 %. The uncertainty evaluations have been carried out in accordance with UKAS requirements.

## NOTES

- [1]. The reported reference time is stated consistent with the format given in ISO 8601:2004. UTC is the abbreviation for Universal Time, Coordinated. The date is stated in the format YYYY-MM-DD such that 2008-09-01 represents 1 September 2008.
- [2]. The recommended half life of  $^{236}\text{Pu}$  is 1044 (6) days and is taken from the evaluations published in *Nuclear Data Sheets*.
- [3]. The recommended half life of  $^{226}\text{Ra}$  is  $5.844 (50) \times 10^5$  days and is taken from the evaluations of the *Decay Data Evaluation Project*, see for example [www.nucleide.org/DDEP.htm](http://www.nucleide.org/DDEP.htm).
- [4]. The recommended half life of  $^{232}\text{U}$  is 25800 (800) days and is taken from the evaluations of the *Decay Data Evaluation Project*, see for example [www.nucleide.org/DDEP.htm](http://www.nucleide.org/DDEP.htm).
- [5]. The recommended half life of  $^{237}\text{Np}$  is  $7.83 (6) \times 10^8$  days and is taken from the evaluations of the *Decay Data Evaluation Project*, see for example [www.nucleide.org/DDEP.htm](http://www.nucleide.org/DDEP.htm).
- [6]. The recommended half life of  $^{228}\text{Th}$  is 698.60 (46) days and is taken from the evaluations of the *Decay Data Evaluation Project*, see for example [www.nucleide.org/DDEP.htm](http://www.nucleide.org/DDEP.htm).

## UNCERTAINTIES

The reported uncertainties are based on standard uncertainties multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95 %. The uncertainty evaluations have been carried out in accordance with UKAS requirements.



# Standard Traceability Log Rad

| Source Material Info |                 |
|----------------------|-----------------|
| Parent Code:         | 1430            |
| Prepared By:         | Ashley Drochter |
| Carrier Conc:        | 2 M HNO3        |
| Reference Date:      | 07/01/2009      |
| Ampoule Mass (g):    | 4.97 g          |
| Uncertainty:         | +/- .36 %       |
| LogBook No:          | RC-S-051-149    |

| A Solution Material Info |                 |
|--------------------------|-----------------|
| Isotope:                 | Plutonium-236   |
| Prepared By:             | Ashley Drochter |
| Prep Date:               | 01/27/2010      |
| Verification Date:       | 01/27/2010      |
| Expiration Date:         | 01/27/2011      |
| Primary Code:            | 1430-A          |
| Dilution(mL):            | 100 mL          |
| Mass of Parent(g):       | 4.8051 g        |
| Density(g/mL):           | 1.0610          |
| Balance ID:              | 38080204        |

## Calculations Converting parent activity to dpm/mL/dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$

$(4.8051 \text{ g}) * (170.8 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (100 \text{ mL}) = 492.4266 \text{ dpm/mL}$

$(4.8051 \text{ g}) * (170.8 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (1.0610 \text{ g/mL}) / (100 \text{ mL}) = 464.1156 \text{ dpm/g}$

## Secondary Standards

| Prep Date  | Preparer        | Mass Primary | Dilution (mL) | Code   | Conc dpm/mL       | Verification Date | Expiration Date |
|------------|-----------------|--------------|---------------|--------|-------------------|-------------------|-----------------|
| 01/27/2010 | Bethany Fiem    | 33.0429      | 200           | 1430-B | 76.6786262 dpm/mL | 01/27/2010        | 01/27/2011      |
| 03/01/2010 | Ashley Drochter | 15.2331      | 200           | 1430-C | 35.3496 dpm/mL    | 03/01/2010        | 03/01/2011      |

GEL Laboratories LLC  
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## Verification for Plutonium-236 Standard 1430-C

|                         | Isotope     | Value                      | Uncertainty |
|-------------------------|-------------|----------------------------|-------------|
| A. Drochter<br>3/4/2010 | 1430-C      | 2.760                      | 0.4480      |
|                         | 1430-C      | 2.770                      | 0.4520      |
|                         | 1430-C      | 2.950                      | 0.4850      |
| Mean Value (Counting) = | 2.827       | 104.54659 % of Known Value |             |
| Stdev =                 | 0.106926766 |                            |             |
| Target =                | 2.70        |                            |             |
| Lower Limit =           | 2.612813134 |                            |             |
| Upper Limit =           | 3.040520199 |                            |             |
| Rule 1 Pass/Fail        | Pass        | Pass                       | Pass        |
| Two sigma =             | 0.213853532 |                            |             |
| 10 % of Mean =          | 0.282666667 |                            |             |
| Rule 2 (Pass/Fail)      | Pass        |                            |             |

The analyst prepared three standard verification sources for standard 1430-B using 0.1 mL for each source. Each standard was combined with 0.1 mL of Pu 239 standard 0338-BB and 50 micrograms of neodymium carrier in a disposable centrifuge tube containing 4 mL of 2 M HCl and 6 mL of DI water. Four drops of 25% Hydrazine dihydrochloride were added to each centrifuge tube and swirled. After approximately ten minutes, two mL of 49% HF was added to precipitate neodymium(and plutonium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Pu-236 were calculated by comparison to Pu-239 certified values.

*file* 3/5/10  
*file* 3/5/10



**Eckert & Ziegler**  
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www.analytiscinc.com

**CERTIFICATE OF CALIBRATION**  
Standard Radionuclide Source

**78747-278**

1283

**U-232 5 mL Liquid in Flame Sealed Vial**

**Customer:** GEL Laboratories, LLC  
**P.O. No.:** 7319 RD, Item 1

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

|   |                            |
|---|----------------------------|
| Isotope:                                | U-232                      |
| Activity (Bq):                          | 3.754 E3                   |
| Half-Life:                              | 68.9 years                 |
| Calibration Date:                       | December 9, 2008 12:00 EST |
| Relative Expanded<br>Uncertainty (k=2): | 5.0%                       |

**Comments:**

Impurities: U-233 <0.3%, Am-241 <0.15%  
5.20453 grams 1M HNO<sub>3</sub> solution.

Source Prepared By: W. Mao  
W. Mao, Radiochemist

QA Approved: D. M. Montgomery  
D. M. Montgomery, QA Manager

Date: 12-11-08

# Standard Traceability Log Rad

| Source Material Info |              |
|----------------------|--------------|
| Parent Code:         | 1283         |
| Prepared By:         | Daniel Roy   |
| Carrier Conc:        | 1M HNO3      |
| Reference Date:      | 12/09/2008   |
| Ampoule Mass (g):    | 5.20453 g    |
| Uncertainty:         | +/- 5 %      |
| LogBook No:          | RC-S-051-002 |

| A Solution Material Info |             |
|--------------------------|-------------|
| Isotope:                 | Uranium-232 |
| Prepared By:             | Daniel Roy  |
| Prep Date:               | 12/16/2008  |
| Verification Date:       | 12/30/2008  |
| Expiration Date:         | 12/30/2009  |
| Primary Code:            | 1283-A      |
| Dilution(mL):            | 100 mL      |
| Mass of Parent(g):       | 5.0245 g    |
| Density(g/mL):           | 1.0285      |
| Balance ID:              |             |

## Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$

$(5.0245 \text{ g}) * (3754 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.20453 \text{ g} * 100 \text{ mL}) = 2174.4872 \text{ dpm/mL}$

$(5.0245 \text{ g}) * (3754 \text{ Bq}) * (60 \text{ dpm/Bq}) / (1.0285 \text{ g/mL}) / (5.20453 \text{ g} * 100 \text{ mL}) = 2114.1700 \text{ dpm/g}$

## Secondary Standards

| Prep Date  | Preparer        | Mass Primary | Dilution (mL) | Code   | Conc dpm/mL    | Verification Date | Expiration Date |
|------------|-----------------|--------------|---------------|--------|----------------|-------------------|-----------------|
| 12/16/2008 | Daniel Roy      | 25.1813      | 1000          | 1283-B | 53.2375 dpm/ml | 12/16/2008        | 12/16/2009      |
| 12/30/2008 | Tina Schoneman  | 2.05         | 250           | 1283-C | 17.336 dpm/mL  | 12/02/2009        | 12/02/2010      |
| 12/30/2008 | Tina Schoneman  | .49          | 250           | 1283-D | 4.1438 dpm/mL  | 01/09/2009        | 01/09/2010      |
| 01/14/2009 | Mary Aders      | 25.0528      | 1000          | 1283-E | 52.9659 dpm/ml | 01/15/2009        | 01/15/2010      |
| 12/02/2009 | Julie Strock    | 2.076        | 250           | 1283-F | 17.5561 dpm/mL | 01/09/2009        | 12/30/2009      |
| 12/02/2009 | Julie Strock    | .517         | 250           | 1283-G | 4.3721 dpm/mL  | 01/08/2010        | 12/02/2010      |
| 12/09/2009 | Ashley Drochter | 21.56        | 1000          | 1283-H | 45.58 dpm/mL   | 12/09/2009        | 12/09/2010      |

## Verification for Uranium-232 Standard 1283-H

|                                |                 |              |                           |             |       |
|--------------------------------|-----------------|--------------|---------------------------|-------------|-------|
| <b>Analyst: A. Drochter</b>    | <b>Serial #</b> | <b>Value</b> | <b>Uncertainty</b>        |             |       |
| <b>Date: 12/10/09</b>          | 1283-H N1       | 2.020        | pCi/L                     | 0.238       | pCi/L |
|                                | 1283-H N2       | 2.000        | pCi/L                     | 0.234       | pCi/L |
|                                | 1283-H N3       | 2.060        | pCi/L                     | 0.242       | pCi/L |
| <b>Mean Value (Counting) =</b> | 2.027           | pCi/L        | <b>99.66904</b>           | <b>Pass</b> |       |
| <b>Stdev =</b>                 | 0.030550505     | pCi/L        | <b>Rule 3 (Pass/Fail)</b> |             |       |
| <b>Target =</b>                | 2.033           | pCi/L        |                           |             |       |
| <b>Lower Limit =</b>           | 1.965565657     | pCi/L        |                           |             |       |
| <b>Upper Limit =</b>           | 2.087767676     | pCi/L        |                           |             |       |
| <b>Rule 1 Pass/Fail</b>        | <b>Pass</b>     |              |                           |             |       |
| <b>Two sigma =</b>             | 0.061101009     |              |                           |             |       |
| <b>10 % of Mean =</b>          | 0.202666667     |              |                           |             |       |
| <b>Rule 2 (Pass/Fail)</b>      | <b>Pass</b>     |              |                           |             |       |

**Rule 1 =** The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements

**Rule 2 =** The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

**Rule 3 =** The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for standard 1283-H using 0.1 mL for each source. Each standard was combined with 0.1 mL of U-238 standard 1163-G and was diluted to 10 mL with DI water. 50 micrograms of neodymium carrier and 1ml of Titanium Chloride were added. The solution was allowed to sit for 30 seconds. One mL of 49% HF was then added to precipitate neodymium (and uranium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for U-238 were calculated by comparison to U-232 certified values.

*A. Drochter*  
12/14/09

# RUNLOGS

# Instrument Run Log

**Instrument Type: GAMMA SPECTROMETER**

**Batch ID: 958216**

| Sample ID  | Sample Type | Analyst | Instrument | Run Date        | Status | Geometry | Calibration Date |
|------------|-------------|---------|------------|-----------------|--------|----------|------------------|
| 247964001  | SAMPLE      | MXR1    | GAM16      | 10-MAR-10 21:17 | DONE   | CAN      | 16-NOV-09 00:00  |
| 247964002  | SAMPLE      | MXR1    | GAM25      | 10-MAR-10 21:17 | DONE   | CAN      | 07-OCT-09 00:00  |
| 247964003  | SAMPLE      | MXR1    | GAM05      | 10-MAR-10 23:08 | DONE   | CAN      | 11-JUN-09 00:00  |
| 247964004  | SAMPLE      | MXR1    | GAM13      | 10-MAR-10 23:09 | DONE   | CAN      | 11-FEB-10 00:00  |
| 247964005  | SAMPLE      | MXR1    | GAM15      | 10-MAR-10 23:10 | DONE   | CAN      | 03-FEB-10 00:00  |
| 247969001  | SAMPLE      | MXR1    | GAM18      | 10-MAR-10 23:10 | DONE   | CAN      | 23-APR-09 00:00  |
| 247969002  | SAMPLE      | MXR1    | GAM21      | 10-MAR-10 23:10 | DONE   | CAN      | 28-JUL-09 00:00  |
| 247969003  | SAMPLE      | MXR1    | GAM22      | 10-MAR-10 23:11 | DONE   | CAN      | 02-DEC-09 00:00  |
| 247969004  | SAMPLE      | MXR1    | GAM23      | 10-MAR-10 23:11 | DONE   | CAN      | 02-JUN-09 00:00  |
| 247969005  | SAMPLE      | MXR1    | GAM16      | 10-MAR-10 23:25 | DONE   | CAN      | 16-NOV-09 00:00  |
| 247969006  | SAMPLE      | MXR1    | GAM23      | 11-MAR-10 14:14 | DONE   | CAN      | 02-JUN-09 00:00  |
| 247969007  | SAMPLE      | MXR1    | GAM11      | 11-MAR-10 14:15 | DONE   | CAN      | 18-NOV-09 00:00  |
| 247969008  | SAMPLE      | MXR1    | GAM17      | 11-MAR-10 14:17 | DONE   | CAN      | 06-JAN-10 00:00  |
| 247970001  | SAMPLE      | MXR1    | GAM18      | 11-MAR-10 14:18 | DONE   | CAN      | 23-APR-09 00:00  |
| 247970002  | SAMPLE      | MXR1    | GAM21      | 11-MAR-10 14:18 | DONE   | CAN      | 28-JUL-09 00:00  |
| 247970003  | SAMPLE      | MXR1    | GAM15      | 11-MAR-10 16:04 | DONE   | CAN      | 03-FEB-10 00:00  |
| 247970004  | SAMPLE      | MXR1    | GAM05      | 11-MAR-10 18:12 | DONE   | CAN      | 11-JUN-09 00:00  |
| 247970005  | SAMPLE      | MXR1    | GAM04      | 11-MAR-10 19:25 | DONE   | CAN      | 05-MAY-09 00:00  |
| 247970006  | SAMPLE      | MXR1    | GAM06      | 11-MAR-10 19:25 | DONE   | CAN      | 16-FEB-10 00:00  |
| 247970007  | SAMPLE      | MXR1    | GAM14      | 11-MAR-10 19:26 | DONE   | CAN      | 06-MAR-09 00:00  |
| 1202054948 | MB          | MXR1    | GAM20      | 11-MAR-10 19:26 | DONE   | CAN      | 26-AUG-09 00:00  |
| 1202054949 | DUP         | MXR1    | GAM23      | 11-MAR-10 19:27 | DONE   | CAN      | 02-JUN-09 00:00  |
| 1202054950 | LCS         | MXR1    | GAM21      | 11-MAR-10 19:35 | DONE   | CAN      | 28-JUL-09 00:00  |

# Instrument Run Log

**Instrument Type: ALPHA SPECTROMETER**

**Batch ID: 962401**

| Sample ID  | Sample Type | Analyst | Instrument | Run Date        | Status | Geometry | Calibration Date |
|------------|-------------|---------|------------|-----------------|--------|----------|------------------|
| 247964004  | SAMPLE      | JXH2    | 1215       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247964005  | SAMPLE      | JXH2    | 1216       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247969001  | SAMPLE      | JXH2    | 1217       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247969002  | SAMPLE      | JXH2    | 1218       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247969003  | SAMPLE      | JXH2    | 1219       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247969004  | SAMPLE      | JXH2    | 1220       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247969005  | SAMPLE      | JXH2    | 1221       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247969006  | SAMPLE      | JXH2    | 1222       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247969007  | SAMPLE      | JXH2    | 1223       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247969008  | SAMPLE      | JXH2    | 1224       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247970001  | SAMPLE      | JXH2    | 1225       | 22-MAR-10 03:05 | DONE   |          |                  |
| 247970002  | SAMPLE      | JXH2    | 1226       | 22-MAR-10 03:06 | DONE   |          |                  |
| 247970003  | SAMPLE      | JXH2    | 1229       | 22-MAR-10 03:06 | DONE   |          |                  |
| 247970004  | SAMPLE      | JXH2    | 1230       | 22-MAR-10 03:06 | DONE   |          |                  |
| 247970005  | SAMPLE      | JXH2    | 1231       | 22-MAR-10 03:06 | DONE   |          |                  |
| 247970006  | SAMPLE      | JXH2    | 1232       | 22-MAR-10 03:06 | DONE   |          |                  |
| 247970007  | SAMPLE      | JXH2    | 1233       | 22-MAR-10 03:06 | DONE   |          |                  |
| 1202064503 | MB          | JXH2    | 1234       | 22-MAR-10 03:06 | DONE   |          |                  |
| 1202064504 | DUP         | JXH2    | 1235       | 22-MAR-10 03:06 | DONE   |          |                  |
| 1202064505 | LCS         | JXH2    | 1236       | 22-MAR-10 03:06 | DONE   |          |                  |
| 247964001  | SAMPLE      | JXH2    | 1209       | 22-MAR-10 11:14 | DONE   |          |                  |
| 247964002  | SAMPLE      | JXH2    | 1210       | 22-MAR-10 11:14 | DONE   |          |                  |
| 247964003  | SAMPLE      | JXH2    | 1211       | 22-MAR-10 11:14 | DONE   |          |                  |



# Instrument Run Log

**Instrument Type: ALPHA SPECTROMETER**

**Batch ID: 962402**

| Sample ID  | Sample Type | Analyst | Instrument | Run Date        | Status | Geometry | Calibration Date |
|------------|-------------|---------|------------|-----------------|--------|----------|------------------|
| 1202064508 | LCS         | JXH2    | 1112       | 22-MAR-10 09:59 | DONE   |          |                  |
| 247964001  | SAMPLE      | JXH2    | 1013       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247964002  | SAMPLE      | JXH2    | 1014       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247964003  | SAMPLE      | JXH2    | 1016       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247964004  | SAMPLE      | JXH2    | 1017       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247964005  | SAMPLE      | JXH2    | 1018       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247969001  | SAMPLE      | JXH2    | 1083       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247969002  | SAMPLE      | JXH2    | 1084       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247969003  | SAMPLE      | JXH2    | 1085       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247969004  | SAMPLE      | JXH2    | 1086       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247969005  | SAMPLE      | JXH2    | 1087       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247969006  | SAMPLE      | JXH2    | 1088       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247969007  | SAMPLE      | JXH2    | 1089       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247969008  | SAMPLE      | JXH2    | 1090       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247970001  | SAMPLE      | JXH2    | 1091       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247970002  | SAMPLE      | JXH2    | 1093       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247970003  | SAMPLE      | JXH2    | 1094       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247970004  | SAMPLE      | JXH2    | 1095       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247970005  | SAMPLE      | JXH2    | 1096       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247970006  | SAMPLE      | JXH2    | 1097       | 22-MAR-10 22:24 | DONE   |          |                  |
| 247970007  | SAMPLE      | JXH2    | 1098       | 22-MAR-10 22:24 | DONE   |          |                  |
| 1202064506 | MB          | JXH2    | 1099       | 22-MAR-10 22:24 | DONE   |          |                  |
| 1202064507 | DUP         | JXH2    | 1100       | 22-MAR-10 22:24 | DONE   |          |                  |

# Instrument Run Log

**Instrument Type: ALPHA SPECTROMETER**

**Batch ID: 962404**

| Sample ID  | Sample Type | Analyst | Instrument | Run Date        | Status | Geometry | Calibration Date |
|------------|-------------|---------|------------|-----------------|--------|----------|------------------|
| 247970006  | SAMPLE      | JXH2    | 1007       | 20-MAR-10 12:43 | DONE   |          |                  |
| 247970007  | SAMPLE      | JXH2    | 1008       | 20-MAR-10 12:43 | DONE   |          |                  |
| 1202064509 | MB          | JXH2    | 1009       | 20-MAR-10 12:43 | DONE   |          |                  |
| 1202064510 | DUP         | JXH2    | 1010       | 20-MAR-10 12:43 | DONE   |          |                  |
| 1202064511 | LCS         | JXH2    | 1011       | 20-MAR-10 12:43 | DONE   |          |                  |
| 247964001  | SAMPLE      | JXH2    | 1119       | 22-MAR-10 21:19 | DONE   |          |                  |
| 247964002  | SAMPLE      | JXH2    | 1120       | 22-MAR-10 21:19 | DONE   |          |                  |
| 247964003  | SAMPLE      | JXH2    | 1121       | 22-MAR-10 21:19 | DONE   |          |                  |
| 247964004  | SAMPLE      | JXH2    | 1122       | 22-MAR-10 21:19 | DONE   |          |                  |
| 247964005  | SAMPLE      | JXH2    | 1123       | 22-MAR-10 21:19 | DONE   |          |                  |
| 247969001  | SAMPLE      | JXH2    | 1124       | 22-MAR-10 21:19 | DONE   |          |                  |
| 247969002  | SAMPLE      | JXH2    | 1125       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247969003  | SAMPLE      | JXH2    | 1126       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247969004  | SAMPLE      | JXH2    | 1127       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247969005  | SAMPLE      | JXH2    | 1128       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247969006  | SAMPLE      | JXH2    | 1129       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247969007  | SAMPLE      | JXH2    | 1130       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247969008  | SAMPLE      | JXH2    | 1135       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247970001  | SAMPLE      | JXH2    | 1136       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247970002  | SAMPLE      | JXH2    | 1139       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247970003  | SAMPLE      | JXH2    | 1140       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247970004  | SAMPLE      | JXH2    | 1141       | 22-MAR-10 21:20 | DONE   |          |                  |
| 247970005  | SAMPLE      | JXH2    | 1142       | 22-MAR-10 21:20 | DONE   |          |                  |

# Instrument Run Log

Instrument Type: LSC

Batch ID: 964049

| Sample ID  | Sample Type | Analyst | Instrument | Run Date        | Status | Geometry                       | Calibration Date |
|------------|-------------|---------|------------|-----------------|--------|--------------------------------|------------------|
| 247964002  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 10:24 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247964003  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 11:02 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247964005  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 12:17 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247969001  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 13:09 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247969002  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 13:47 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247969003  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 14:25 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247969004  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 15:02 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247969005  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 15:40 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247969006  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 16:17 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247969007  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 16:55 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 247969008  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 17:32 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 248028001  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 18:25 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 248028002  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 19:02 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 248028003  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 19:40 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 248028004  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 20:17 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 248028005  | SAMPLE      | KXK2    | LSCORANGE  | 15-MAR-10 20:55 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 1202068193 | DUP         | KXK2    | LSCORANGE  | 15-MAR-10 22:10 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 1202068194 | LCS         | KXK2    | LSCORANGE  | 15-MAR-10 22:48 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |
| 1202068192 | MB          | KXK2    | LSCYELLOW  | 17-MAR-10 15:23 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 21-AUG-09 00:00  |
| 247964001  | SAMPLE      | KXK2    | LSCGOLD    | 19-MAR-10 14:45 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 20-AUG-09 00:00  |
| 247964004  | SAMPLE      | KXK2    | LSCORANGE  | 22-MAR-10 17:53 | DONE   | 10mL DW/13mL<br>Ecoscint Ultra | 24-JUL-09 00:00  |