# WESTON SOLUTIONS, INC.

## PO# 0094759

## STANDARD LEVEL IV
## REPORT OF ANALYSIS

## WORK ORDER #17-07087-OR

**September 15, 2017**

**EBERLINE ANALYTICAL/OAK RIDGE LABORATORY**
**OAK RIDGE, TN**

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**Eberline Services – Oak Ridge Laboratory**

**LABORATORY DATA SUPPORT CHECKLIST**

MP-001-3

Eberline Services Work Order # 17-07087

The checklist items listed below are to be initialed by appropriate staff upon completion/verification.

| Date for Partial | Initials | Date | Initials | Checklist Items |
|---|---|---|---|---|
| | | 7-18-17 | SGB | Sample Log-In |
| | | 8-25-17 | NJL | Data Compilation |
| | | 9/25/17 | [illegible] | First Technical Data Review |
| | | 9/8/17 | [illegible] | Second Technical Data Review |
| | | 9/13/17 | [illegible] | Data Entry/Electronic Deliverable |
| | | 9/13/17 | [illegible] | Case Narrative |
| | | 09/14/17 | EJT | Electronic Deliverable Proof |
| | | 9/14/17 | [illegible] | Samples Analyzed within Holding Time Yes? [X] No? [ ] |
| | | 9/14/17 | [illegible] | QA/QC Review |
| | | | | Client in Possession of Data Electronic or Hard Copy |
| | | | | Invoiced by Laboratory |

| Technical/Clerical Corrections, Signatures Needed, Problems, Etc | Date/Initials |
|---|---|
| | |
| | |
| | |
| | |

Date package approved by: [signature] 9/14/17

Laboratory Manager Date

Copy No. _____

# SECTION I

# CHAIN OF CUSTODY

**USEPA**
DateShipped: 7/17/2017
CarrierName: FedEx
AirbillNo:

**CHAIN OF CUSTODY RECORD**
Case #: 445
Contact Name: Patrick Buster
Contact Phone: 903-348-3917

17-07087
REC'D JUL 18 2017

**No: 2-071417-134807-0007**
Cooler #:
Lab: Eberline Analytical
Lab Phone: 865-481-0683

| Lab # | Sample # | Analyses | Matrix | Collected | Sample Time | Numb Cont | Container | Lab QC | Sample_Remarks |
|---|---|---|---|---|---|---|---|---|---|
| | HTC-A02-S003-2430-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 12:09 | 1 | 16 oz Poly Jar | N | 943.9 g |
| | HTC-A02-S003-3036-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 12:06 | 1 | 16 oz Poly Jar | N | 828.3 g |
| | HTC-A02-S003-3642-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 12:03 | 1 | 16 oz Poly Jar | N | 800.3 g |
| | HTC-A02-S003-4248-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 12:00 | 1 | 16 oz Poly Jar | N | 736.5 g |
| | HTC-A02-S004-0006-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:29 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A02-S004-0612-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:27 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A02-S004-1218-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:25 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A02-S004-1824-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:23 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A02-S004-2430-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:21 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A02-S004-3036-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:19 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A02-S004-3642-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:17 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A02-S004-4248-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:15 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S001-0006-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:26 | 1 | 16 oz Poly Jar | Y | 712.01 |
| | HTC-A03-S001-0006-02 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:26 | 1 | 16 oz Poly Jar | N | 784.5 g |
| | HTC-A03-S001-0612-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:23 | 1 | 16 oz Poly Jar | N | 852.4 g |
| | HTC-A03-S001-1218-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:20 | 1 | 16 oz Poly Jar | N | 1092.2 g |
| | HTC-A03-S001-1824-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:17 | 1 | 16 oz Poly Jar | N | 1084.3 g |
| | HTC-A03-S001-2430-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:14 | 1 | 16 oz Poly Jar | N | 937.8 g |
| | HTC-A03-S001-3036-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:11 | 1 | 16 oz Poly Jar | N | 1029.5 g |
| | HTC-A03-S001-3642-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:08 | 1 | 16 oz Poly Jar | N | 826.3 g |
| | HTC-A03-S001-4248-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:05 | 1 | 16 oz Poly Jar | N | 1045.3 g |
| 4 | HTC-A03-S002-0006-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:39 | 1 | 16 oz Poly Jar | N | 1029.3 g |

Special Instructions: Gamma Spec( EPA 901.0) analysis in jar "as is" for Ra-226 using 186keV peak for samples. From U decay chain "as is": Th-234, Pa-234 or Pa-234m, Pb-214, Bi-214. From the Th decay chain "as is": Ra-228 and/or Ac-228, Ra-224, Pb-212, Bi-212, Tl-208. For Gamma Spec (homogenized) after 21 day ingrowth: Ra-226 using Bi-214 and/or Pb-214. From U decay chain: Th-234, Pa-234 or Pa-234m. From Th decay chain: Ra-228 and/or Ac-228, Ra-224, Pb-212, Bi-212, Tl-208. Other radionuclides: Cs-137, K-40. Alpha Spec: Iso U (EPA 908.0 Modified): U-233/234, U-235/236, U-238. Iso Th (EPA 907.0 Modified): Th-230, 232, 228. No rocks should be removed, all samples to be pulverized.

**SAMPLES TRANSFERRED FROM**

**CHAIN OF CUSTODY #**

| Items/Reason | Relinquished by (Signature and Organization) | Date/Time | Received by (Signature and Organization) | Date/Time | Sample Condition Upon Receipt |
|---|---|---|---|---|---|
| all Samples all Analysis | Chad Conway - Weston | 7-17-17/1600 | [signature] | 0930 7-18-17 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

0005

USEPA
DateShipped: 7/17/2017
CarrierName: FedEx
AirbillNo:

**CHAIN OF CUSTODY RECORD**
Case #: 445
Contact Name: Patrick Buster
Contact Phone: 903-348-3917

17-07087
REC'D JUL 18 2017

**No: 2-071417-134807-0007**
Cooler #:
Lab: Eberline Analytical
Lab Phone: 865-481-0683

| Lab # | Sample # | Analyses | Matrix | Collected | Sample Time | Numb Cont | Container | Lab QC | Sample_Remarks |
|---|---|---|---|---|---|---|---|---|---|
| 5 | HTC-A03-S002-0612-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:36 | 1 | 16 oz Poly Jar | N | 984.2 g |
| 6 | HTC-A03-S002-1218-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:33 | 1 | 16 oz Poly Jar | N | 1005.0 g |
| 7 | HTC-A03-S002-1824-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:27 | 1 | 16 oz Poly Jar | N | Weight N/A |
| 8 | HTC-A03-S002-2430-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:24 | 1 | 16 oz Poly Jar | N | Weight N/A |
| 9 10 11 | HTC-A03-S002-3036-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:21 | 1 | 16 oz Poly Jar | Y | Weight N/A |
| 12 | HTC-A03-S002-3036-02 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:21 | 1 | 16 oz Poly Jar | N | Weight N/A |
| 13 | HTC-A03-S002-3642-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:18 | 1 | 16 oz Poly Jar | N | 1069.3 g |
| 14 | HTC-A03-S002-4248-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 09:15 | 1 | 16 oz Poly Jar | N | 1066.5 g |
| 15 | HTC-A03-S003-0006-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:48 | 1 | 16 oz Poly Jar | N | Weight N/A |
| 16 | HTC-A03-S003-0612-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:45 | 1 | 16 oz Poly Jar | N | Weight N/A |
| 17 | HTC-A03-S003-1218-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:42 | 1 | 16 oz Poly Jar | N | Weight N/A |
| 18 | HTC-A03-S003-1824-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:39 | 1 | 16 oz Poly Jar | N | Weight N/A |
| 19 | HTC-A03-S003-2430-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:36 | 1 | 16 oz Poly Jar | N | Weight N/A |
| 20 | HTC-A03-S003-3036-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:33 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S003-3642-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:30 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S003-4248-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/15/2017 | 08:27 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S004-0006-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/13/2017 | 15:51 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S004-0612-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/13/2017 | 15:48 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S004-1218-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/13/2017 | 15:45 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S004-1824-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/13/2017 | 15:42 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S004-2430-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/13/2017 | 15:39 | 1 | 16 oz Poly Jar | N | Weight N/A |
| | HTC-A03-S004-3036-01 | Gamma Spec (Modified), Isotopic Th and U | Soil/Rock/Slag | 5/13/2017 | 15:36 | 1 | 16 oz Poly Jar | N | Weight N/A |

Special Instructions: Gamma Spec( EPA 901.0) analysis in jar "as is" for Ra-226 using 186keV peak for samples. From U decay chain "as is": Th-234, Pa-234 or Pa-234m, Pb-214, Bi-214. From the Th decay chain "as is": Ra-228 and/or Ac-228, Ra-224, Pb-212, Bi-212, Tl-208. For Gamma Spec (homogenized) after 21 day ingrowth: Ra-226 using Bi-214 and/or Pb-214. From U decay chain: Th-234, Pa-234 or Pa-234m. From Th decay chain: Ra-228 and/or Ac-228, Ra-224, Pb-212, Bi-212, Tl-208. Other radionuclides: Cs-137, K-40. Alpha Spec: Iso U (EPA 908.0 Modified): U-233/234, U-235/236, U-238. Iso Th (EPA 907.0 Modified): Th-230, 232, 228. No rocks should be removed, all samples to be pulverized.

**SAMPLES TRANSFERRED FROM**

**CHAIN OF CUSTODY #**

| Items/Reason | Relinquished by (Signature and Organization) | Date/Time | Received by (Signature and Organization) | Date/Time | Sample Condition Upon Receipt |
|---|---|---|---|---|---|
| all Samples all analysis | Chad Conway - Weston | 7-17-17/1600 | [signature] | 0930 7-18-17 | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

0006

| EBERLINE SERVICES Oak Ridge Laboratory | Internal Chain of Custody | Work Order # | 17-07087 |
|---|---|---|---|
| | | Lab Deadline | 8/10/2017 |
| | | Analysis | UUISO - Level 4 |
| | | Sample Matrix | Soil/Solid |

| Comments | Sample Fraction | HP 210 / 270 Detector Activity | Storage Location |
|---|---|---|---|
| Report on dry weight basis. | 04 | 49 | L1.5 |
| | 05 | 32 | L1.5 |
| | 06 | 51 | L1.5 |
| | 07 | 37 | L1.5 |
| | 08 | 39 | L1.5 |
| | 09 | 48 | L1.5 |
| | 10 | 34 | L1.5 |
| | 11 | 34 | L1.5 |
| | 12 | 35 | L1.5 |
| Fraction 10 is MS of fraction 09. | 13 | 45 | L1.5 |
| | 14 | 37 | L1.5 |
| | 15 | 33 | L1.5 |
| | 16 | 33 | L1.5 |
| Fraction 11 is MSD of fraction 09. | 17 | 39 | L1.5 |
| | 18 | 42 | L1.5 |
| | 19 | 40 | L1.5 |
| | 20 | 47 | L1.5 |

| | Location (circle one) | | | | | Initials | Date |
|---|---|---|---|---|---|---|---|
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room 1200 | Kay Saj | 7-31-17 |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room 1130 | Kay Saj | 8-1-17 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | JL Harvey | 8/4/17 1130 |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | JL Harvey | 8/14/17 0615 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | [illegible] | 8-14-17 0615 |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | [illegible] | 8-22-17 0844 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | [illegible] | 0844 |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | KB | 8/22/17 1529 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |



Printed: 7/19/2017 11:08 AM

| EBERLINE SERVICES Oak Ridge Laboratory | Internal Chain of Custody | Work Order # | 17-07087 |
|---|---|---|---|
| | | Lab Deadline | 8/10/2017 |
| | | Analysis | ThISO - Level 4 |
| | | Sample Matrix | Soil/Solid |

| Comments | Sample Fraction | HP 210 / 270 Detector Activity | Storage Location |
|---|---|---|---|
| Report on dry weight basis. | 04 | 49 | L1.5 |
| | 05 | 32 | L1.5 |
| | 06 | 51 | L1.5 |
| | 07 | 37 | L1.5 |
| | 08 | 39 | L1.5 |
| | 09 | 48 | L1.5 |
| | 10 | 34 | L1.5 |
| | 11 | 34 | L1.5 |
| | 12 | 35 | L1.5 |
| Fraction 10 is MS of fraction 09. | 13 | 45 | L1.5 |
| | 14 | 37 | L1.5 |
| | 15 | 33 | L1.5 |
| | 16 | 33 | L1.5 |
| Fraction 11 is MSD of fraction 09. | 17 | 39 | L1.5 |
| | 18 | 42 | L1.5 |
| | 19 | 40 | L1.5 |
| | 20 | 47 | L1.5 |

| | Location (circle one) | | | | | Initials | Date |
|---|---|---|---|---|---|---|---|
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room 1200 | Kay Saij | 7-31-17 |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room 1134 | Kay Saij | 8-1-17 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | J Harvey | 8/14/17 1130 |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | J Harvey | 8/14/17 0615 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | [illegible] | 8-14-17 0615 |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | [illegible] | 8-23-17 0923 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | [illegible] | [illegible] |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | ICB | 8/23/17 1750 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| **Relinquished by** | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |



Printed: 7/10/2017 11:08 AM

| EBERLINE Oak Ridge Laboratory | Internal Chain of Custody | Work Order # | 17-07087 |
|---|---|---|---|
| | | Lab Deadline | See Comments |
| | | Analysis | Gamma - Level 4 |
| | | Sample Matrix | SO |

| Comments | Sample Fraction | HP 210 / 270 Detector Activity | Storage Location |
|---|---|---|---|
| Re-Analysis: 2Fractions 04-09 & 12-20 only: 21 day ingrowth: Report Ac228, Bi212, Cs137, K40, Pa234m, Pb212, Ra224, Ra226 from Bi214/Pb214, Ra228 from Ac228, Tl208, Th234 & positives. Report on dry weight basis. | 04 | 49 | L1.5 |
| | 05 | 32 | L1.5 |
| | 06 | 51 | L1.5 |
| | 07 | 37 | L1.5 |
| | 08 | 39 | L1.5 |
| | 09 | 48 | L1.5 |
| | 12 | 35 | L1.5 |
| | 13 | 45 | L1.5 |
| | 14 | 37 | L1.5 |
| ~~Original Lab Deadline: 08/15/17~~ Eyr 07/19/17 ~~Rerun Lab Deadline: 08/15/17 Fractions 04-09 & 12-20 only: Quick Counts: Report Ac228, Bi212/214, Cs137, K40, Pa234m, Pb212/214, Ra224, Ra226 from 100% Re-Analysis, Ra228 from Ac228, Tl208, Th234 & positives. Report on "AS-IS" basis.~~ | 15 | 33 | L1.5 |
| | 16 | 33 | L1.5 |
| | 17 | 39 | L1.5 |
| | 18 | 42 | L1.5 |
| | 19 | 40 | L1.5 |
| | 20 | 47 | L1.5 |

| | Location (circle one) | | | | | Technician Initials | |
|---|---|---|---|---|---|---|---|
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room 1200 | Kay Sej | 7-31-17 |
| Relinquished by | Sample Storage | Rough Prep | Prep | Separations | Count Room 1210 | Kay Sej | 8-1-17 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | 1210 | |
| Relinquished by | Sample Storage | Rough Prep | Prep | Separations | Count Room | KB 8/22/17 | 1413 |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Relinquished by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Relinquished by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Relinquished by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Relinquished by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Received by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |
| Relinquished by | Sample Storage | Rough Prep | Prep | Separations | Count Room | | |

## SECTION II

## SAMPLE ACKNOWLEDGEMENT

| Client Name | Contract/PO | Project Type | Date Received | Required Turnaround Days | Eberline Services Work Order |
|---|---|---|---|---|---|
| Weston Solutions, Inc. | 0094759 | Environmental | 07/18/2017 | 28 | 17-07087 |
| **Project Name** | **Client WO** | **Sample Disp** | **Lab Deadline** | **Internal Deadline** | **Client Deadline** |
| 94759 | Case #445 | H | 08/10/2017 | 08/14/2017 | 08/15/2017 |

| Internal ID | Client ID | Sample Date | Matrix | Storage | Gamma | ThISO | UUISO | | | | | | | | | | | | | | | | | | | | | Ttl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | 07/19/17 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 02 | BLANK | 07/19/17 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 03 | DUP | 07/19/17 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 04 | HTC-A03-S002-0006-01 | 05/15/17 09:39 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 05 | HTC-A03-S002-0612-01 | 05/15/17 09:36 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 06 | HTC-A03-S002-1218-01 | 05/15/17 09:33 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 07 | HTC-A03-S002-1824-01 | 05/15/17 09:27 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 08 | HTC-A03-S002-2430-01 | 05/15/17 09:24 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 09 | HTC-A03-S002-3036-01 | 05/15/17 09:21 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 10 | HTC-A03-S002-3036-01 MS | 05/15/17 09:21 | SO | L1.5 | | X | X | | | | | | | | | | | | | | | | | | | | | 2 |
| 11 | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | SO | L1.5 | | X | X | | | | | | | | | | | | | | | | | | | | | 2 |
| 12 | HTC-A03-S002-3036-02 | 05/15/17 09:21 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 13 | HTC-A03-S002-3642-01 | 05/15/17 09:18 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 14 | HTC-A03-S002-4248-01 | 05/15/17 09:15 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 15 | HTC-A03-S003-0006-01 | 05/15/17 08:48 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 16 | HTC-A03-S003-0612-01 | 05/15/17 08:45 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 17 | HTC-A03-S003-1218-01 | 05/15/17 08:42 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 18 | HTC-A03-S003-1824-01 | 05/15/17 08:39 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 19 | HTC-A03-S003-2430-01 | 05/15/17 08:36 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| 20 | HTC-A03-S003-3036-01 | 05/15/17 08:33 | SO | L1.5 | X | X | X | | | | | | | | | | | | | | | | | | | | | 3 |
| | | | | Totals Per Analysis (non QA samples) | 15 | 17 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

EBERLINE SERVICES

**Sample Log In Report**


**Oak Ridge Laboratory**
**601 Scarboro Rd.**
**Oak Ridge, TN 37830**

**Voice: (865) 481-0683**
**Fax: (865) 483-4621**


**Invoice**
Accounts Payable
Weston Solutions, Inc.
1090 King Georges Post Road Suite 201
Edison, NJ 08837
Voice 732-585-4425
Fax

**Contact**
Smita Sumbaly
Voice 732-585-4410
Fax 732-225-7037

**Report Data**
Smita Sumbaly
Weston Solutions, Inc.
1090 King Georges Post Rd Suite 201
Edison, NJ 08837
Voice 732-585-4410
Fax 732-225-7037

0011

Printed: 7/19/2017 11:08 AM

**Eberline Services – Oak Ridge Laboratory**

SAMPLE RECEIPT CHECKLIST
MP-001-2

WORK ORDER # 17-07087

SAMPLE MATRIX/MATRICES: (CIRCLE ONE OR BOTH)

AQUEOUS NON-AQUEOUS

(CIRCLE EITHER YES, NO, OR N/A)

WERE SAMPLES:

| | | | |
|---|---|---|---|
| Received in good condition? | Y | N | |
| If aqueous, properly preserved | Y | N | N/A |

WERE CHAIN OF CUSTODY SEALS:

| | | |
|---|---|---|
| Present on outside of package? | Y | N |
| Unbroken on outside of package? | Y | N |
| Present on samples? | Y | N |
| Unbroken on samples? | Y | N |
| Was chain of custody present upon sample receipt? | Y | N |

IF THE RESPONSE TO ANY OF THE ABOVE IS **NO**, A DISCREPANT SAMPLE RECEIPT REPORT (DSR) HAS BEEN ISSUED.

REMARKS: _____

SIGNATURE: James E Dailey DATE: 7-18-17

# SECTION III

# CASE NARRATIVE

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD
OAK RIDGE, TENNESSEE 37830
PHONE (865) 481-0683
FAX (865) 483-4621

EBS-OR-42688

September 15, 2017

Smita Sumbaly
Weston Solutions, Inc.
1090 King Georges Post Road, Suite 201
Edison, NJ 08837

CASE NARRATIVE
Work Order # 17-07087-OR

SAMPLE RECEIPT

This work order contains fifteen solid samples received 07/18/2017. These samples were analyzed for Isotopic Uranium, Isotopic Thorium and by Gamma Spectroscopy.

| CLIENT ID | LAB ID | CLIENT ID | LAB ID |
|---|---|---|---|
| HTC-A03-S002-0006-01 | 17-07087-04 | HTC-A03-S002-3642-01 | 17-07087-13 |
| HTC-A03-S002-0612-01 | 17-07087-05 | HTC-A03-S002-4248-01 | 17-07087-14 |
| HTC-A03-S002-1218-01 | 17-07087-06 | HTC-A03-S003-0006-01 | 17-07087-15 |
| HTC-A03-S002-1824-01 | 17-07087-07 | HTC-A03-S003-0612-01 | 17-07087-16 |
| HTC-A03-S002-2430-01 | 17-07087-08 | HTC-A03-S003-1218-01 | 17-07087-17 |
| HTC-A03-S002-3036-01 | 17-07087-09 | HTC-A03-S003-1824-01 | 17-07087-18 |
| HTC-A03-S002-3036-01 MS | 17-07087-10 | HTC-A03-S003-2430-01 | 17-07087-19 |
| HTC-A03-S002-3036-01 MSD | 17-07087-11 | HTC-A03-S003-3036-01 | 17-07087-20 |
| HTC-A03-S002-3036-02 | 17-07087-12 | | |

ANALYTICAL METHODS

Isotopic Uranium was analyzed using EPA Method 908.0 Modified. Isotopic Thorium was analyzed using EPA Method 907.0 Modified. Gamma Spectroscopy was performed using EPA Method 901.1 Modified.

ANALYTICAL RESULTS

Combined Standard Uncertainty is reported at 2-sigma value.

Minimum Detectable Activity (MDA) values for data represented in this report are sample-specific. MDA measurements are determined based on factors and conditions including instrument settings, aliquot size and matrix type.

SPECIAL CIRCUMSTANCES

Samples were dried and ground prior to analyses. Results are reported on a "dry weight" basis.

ANALYTICAL RESULTS CONTINUED

ISOTOPIC URANIUM

Samples were prepared by removing representative aliquots followed by mixed acid digestions as appropriate. Uranium was selectively extracted by ion exchange. Uranium was eluted, micro-precipitated and mounted on micro-porous filter media. Sample activities were then determined by alpha spectroscopy using energy specific regions of interest for Uranium-234, Uranium-235 and Uranium-238. Chemical recovery was determined by the use of a Uranium-232 tracer. Activity of the Uranium-232 tracer was determined by alpha spectroscopy using an energy specific region of interest.

Samples demonstrated acceptable results for all Uranium determinations. The Uranium-233/234, Uranium-235/236 and Uranium-238 method blank demonstrated acceptable results. Chemical recovery was acceptable for all samples. Results for the Uranium-233/234 and Uranium-238 duplicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Uranium-235/236 duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Uranium-234 and Uranium-238 laboratory control sample demonstrated an acceptable percent recovery. Results for the Uranium-234 and Uranium-238 matrix spike and matrix spike duplicate demonstrated an acceptable percent recovery.

ISOTOPIC THORIUM

Samples were prepared by removing representative aliquots followed by mixed acid digestions as appropriate. Thorium was selectively extracted by ion exchange. Thorium was eluted, micro-precipitated and mounted on micro-porous filter media. Sample activities were then determined by alpha spectroscopy using energy specific regions of interest for Thorium-228, Thorium-230 and Thorium-232. Chemical recovery was determined by the use of a Thorium-229 tracer. Activity of the Thorium-229 tracer was determined by alpha spectroscopy using an energy specific region of interest.

Samples demonstrated acceptable results for all Thorium determinations. The Thorium-228, Thorium-230 and Thorium-232 method blank demonstrated acceptable results. Chemical recovery was acceptable for all samples. Results for the Thorium-230 duplicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Thorium-228 and Thorium-232 duplicate demonstrated a high relative percent difference; however, normalized difference is within acceptable limits for the analytical technique. Results for the Thorium-228, Thorium-230 and Thorium-232 laboratory control sample demonstrated an acceptable percent recovery. Results for the Thorium-228 matrix spike demonstrated a high percent recovery. Results for the Thorium-230 and Thorium-232 matrix spike demonstrated an acceptable percent recovery. Results for the Thorium-228, Thorium-230 and Thorium-232 matrix spike duplicate demonstrated an acceptable percent recovery.

GAMMA SPECTROSCOPY

Samples were dried, homogenized and placed into appropriate gamma spectroscopy geometry containers. Samples were then sealed for 21 days to allow for ingrowth of Radon-222 and progeny. Samples were counted on High Purity Germanium (HPGe) gamma ray detectors. Energy lines from Lead-214 and Bismuth-214 were analyzed for determinations of Radium-226 activity.

ANALYTICAL RESULTS CONTINUED

GAMMA SPECTROSCOPY CONTINUED

Initially samples were counted on an "as received basis" and preliminary data only was emailed. After the initial count, samples were dried, pulverized and sealed for Radon-222 ingrowth. Samples demonstrated acceptable results for all gamma emitting radionuclides as reported. Results for the method blank demonstrated acceptable results for all gamma emitting radionuclides as reported. Results for the Actinium-228, Radium-226 and Potassium-40 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Cobalt-60 and Cesium-137 laboratory control sample demonstrated an acceptable percent recovery.

CERTIFICATION OF ACCURACY

I certify that this data report is in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.

M.R. McDougall
Laboratory Manager

Date: 9/15/2017

Eberline Analytical wants and encourages your feedback regarding our performance providing radioanalytical services. Please visit http://www.eberlineservices.com/client.htm to provide us with feedback on our services.

# SECTION IV

# ANALYTICAL RESULTS SUMMARY

# Eberline Analytical
## Final Report of Analysis

*Report To:*

Smita Sumbaly
Weston Solutions, Inc.
1090 King Georges Post Rd Suite 201
Edison, NJ 08837

*Work Order Details:*

| | |
|---|---|
| *SDG:* | **17-07087** |
| *Purchase Order:* | 0094759 |
| *Analysis Category:* | ENVIRONMENTAL |
| *Sample Matrix:* | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **21-day INGROWTH** | | | | | | | | | | | |
| 17-07087-01 | LCS | KNOWN | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Cobalt-60 | EPA 901.1 Modified | 1.35E+02 | 5.27E+00 | | | pCi/g |
| 17-07087-01 | LCS | KNOWN | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 8.44E+01 | 3.38E+00 | | | pCi/g |
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Cobalt-60 | EPA 901.1 Modified | 1.24E+02 | 7.50E+00 | 9.83E+00 | 1.20E+00 | pCi/g |
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 8.05E+01 | 9.85E+00 | 1.07E+01 | 1.81E+00 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.19E-03 | 1.26E-01 | 1.26E-01 | 1.80E-01 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | -9.88E-02 | 3.07E-01 | 3.07E-01 | 4.10E-01 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 1.20E-02 | 3.81E-02 | 3.81E-02 | 5.90E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 1.13E-01 | 2.40E-01 | 2.40E-01 | 5.31E-01 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 2.51E+00 | 1.75E+00 | 1.75E+00 | 8.47E-01 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 3.67E-02 | 3.90E-02 | 3.91E-02 | 6.67E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 4.85E-01 | 5.63E-01 | 5.63E-01 | 9.39E-01 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 9.49E-02 | 6.02E-02 | 6.04E-02 | 8.70E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.19E-03 | 1.26E-01 | 1.26E-01 | 1.80E-01 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 7.12E-01 | 4.02E-01 | 4.04E-01 | 6.95E-01 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | -1.21E-02 | 7.89E-02 | 7.89E-02 | 1.16E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 9.08E-01 | 1.73E-01 | 1.79E-01 | 3.61E-01 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 6.88E-01 | 4.26E-01 | 4.27E-01 | 6.75E-01 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 1.76E-02 | 4.73E-02 | 4.73E-02 | 7.39E-02 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 1.69E+01 | 1.93E+00 | 2.12E+00 | 1.05E+00 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | -1.08E+00 | 4.73E+00 | 4.73E+00 | 6.77E+00 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 8.93E-01 | 1.11E-01 | 1.20E-01 | 1.92E-01 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 3.13E+00 | 1.32E+00 | 1.33E+00 | 2.23E+00 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 8.63E-01 | 1.30E-01 | 1.38E-01 | 2.11E-01 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 9.08E-01 | 1.73E-01 | 1.79E-01 | 3.61E-01 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.12E+00 | 9.77E-01 | 9.78E-01 | 1.31E+00 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 6.50E-01 | 1.64E-01 | 1.68E-01 | 2.90E-01 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

| Report To: | |
|---|---|
| Smita Sumbaly | |
| Weston Solutions, Inc. | |
| 1090 King Georges Post Rd Suite 201 | |
| Edison, NJ 08837 | |

| Work Order Details: | |
|---|---|
| SDG: | 17-07087 |
| Purchase Order: | 0094759 |
| Analysis Category: | ENVIRONMENTAL |
| Sample Matrix: | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.00E+00 | 1.45E-01 | 1.54E-01 | 5.04E-01 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 3.95E-01 | 3.34E-01 | 3.35E-01 | 5.42E-01 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 2.61E-02 | 3.83E-02 | 3.83E-02 | 6.18E-02 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 1.65E+01 | 1.86E+00 | 2.04E+00 | 7.91E-01 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 4.48E+00 | 3.96E+00 | 3.97E+00 | 6.99E+00 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 9.09E-01 | 1.13E-01 | 1.22E-01 | 2.41E-01 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 9.59E+00 | 1.32E+00 | 1.41E+00 | 2.13E+00 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 8.23E-01 | 1.34E-01 | 1.41E-01 | 1.80E-01 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.00E+00 | 1.45E-01 | 1.54E-01 | 5.04E-01 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.17E+00 | 9.94E-01 | 9.96E-01 | 1.65E+00 | pCi/g |
| 17-07087-04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 7.99E-01 | 1.38E-01 | 1.44E-01 | 1.62E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 4.56E-01 | 1.37E-01 | 1.39E-01 | 2.21E-01 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 3.52E-01 | 2.16E-01 | 2.16E-01 | 4.71E-01 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 2.24E-02 | 3.11E-02 | 3.11E-02 | 5.16E-02 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 8.93E+00 | 1.25E+00 | 1.33E+00 | 8.13E-01 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | -6.24E-01 | 3.57E+00 | 3.57E+00 | 5.32E+00 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 5.75E-01 | 1.08E-01 | 1.12E-01 | 1.46E-01 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 3.53E+00 | 1.14E+00 | 1.16E+00 | 1.52E+00 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 5.34E-01 | 9.34E-02 | 9.73E-02 | 1.31E-01 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 4.56E-01 | 1.37E-01 | 1.39E-01 | 2.21E-01 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.10E+00 | 5.30E-01 | 5.34E-01 | 8.75E-01 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 4.21E-01 | 8.66E-02 | 8.92E-02 | 8.17E-02 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

| Report To: | |
|---|---|
| Smita Sumbaly | |
| Weston Solutions, Inc. | |
| 1090 King Georges Post Rd Suite 201 | |
| Edison, NJ 08837 | |

| Work Order Details: | |
|---|---|
| SDG: | 17-07087 |
| Purchase Order: | 0094759 |
| Analysis Category: | ENVIRONMENTAL |
| Sample Matrix: | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 7.86E-01 | 1.93E-01 | 1.97E-01 | 3.43E-01 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 6.09E-01 | 5.96E-01 | 5.97E-01 | 9.87E-01 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 4.96E-02 | 4.94E-02 | 4.94E-02 | 8.31E-02 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 1.56E+01 | 1.91E+00 | 2.07E+00 | 9.62E-01 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 2.26E+00 | 5.28E+00 | 5.28E+00 | 8.51E+00 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 8.59E-01 | 1.20E-01 | 1.28E-01 | 2.13E-01 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 1.30E+01 | 1.64E+00 | 1.77E+00 | 2.47E+00 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 1.12E+00 | 1.42E-01 | 1.53E-01 | 1.99E-01 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 7.86E-01 | 1.93E-01 | 1.97E-01 | 3.43E-01 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.48E+00 | 1.04E+00 | 1.04E+00 | 1.41E+00 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 8.81E-01 | 1.66E-01 | 1.72E-01 | 2.09E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.08E+00 | 1.85E-01 | 1.93E-01 | 3.63E-01 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 8.02E-01 | 4.19E-01 | 4.21E-01 | 6.82E-01 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 6.68E-02 | 4.40E-02 | 4.41E-02 | 6.87E-02 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 1.93E+01 | 2.30E+00 | 2.50E+00 | 9.22E-01 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 2.45E+00 | 5.12E+00 | 5.12E+00 | 8.41E+00 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.13E+00 | 1.31E-01 | 1.43E-01 | 2.18E-01 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 2.63E+00 | 1.40E+00 | 1.40E+00 | 2.50E+00 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 9.37E-01 | 1.35E-01 | 1.43E-01 | 2.76E-01 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.08E+00 | 1.85E-01 | 1.93E-01 | 3.63E-01 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.33E+00 | 7.50E-01 | 7.53E-01 | 1.22E+00 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 9.44E-01 | 1.66E-01 | 1.73E-01 | 2.57E-01 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

| Report To: | Work Order Details: | |
|---|---|---|
| Smita Sumbaly | SDG: | 17-07087 |
| Weston Solutions, Inc. | Purchase Order: | 0094759 |
| 1090 King Georges Post Rd Suite 201 | Analysis Category: | ENVIRONMENTAL |
| Edison, NJ 08837 | Sample Matrix: | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.10E+00 | 2.42E-01 | 2.48E-01 | 5.86E-01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 8.11E-01 | 5.24E-01 | 5.25E-01 | 8.26E-01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 1.08E-01 | 7.60E-02 | 7.62E-02 | 1.27E-01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 2.10E+01 | 2.57E+00 | 2.78E+00 | 1.52E+00 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 3.13E+00 | 6.59E+00 | 6.59E+00 | 1.07E+01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.16E+00 | 1.55E-01 | 1.66E-01 | 2.61E-01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 1.62E+01 | 2.09E+00 | 2.25E+00 | 3.12E+00 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 1.22E+00 | 1.88E-01 | 1.98E-01 | 2.27E-01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.10E+00 | 2.42E-01 | 2.48E-01 | 5.86E-01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.77E+00 | 1.50E+00 | 1.50E+00 | 2.50E+00 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 9.73E-01 | 1.97E-01 | 2.03E-01 | 2.76E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.01E+00 | 2.59E-01 | 2.65E-01 | 4.98E-01 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 3.00E-01 | 6.88E-01 | 6.88E-01 | 1.01E+00 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 2.01E-01 | 1.06E-01 | 1.07E-01 | 1.63E-01 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 1.59E+01 | 2.24E+00 | 2.39E+00 | 1.28E+00 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | -7.23E+00 | 9.40E+00 | 9.41E+00 | 1.16E+01 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.19E+00 | 2.01E-01 | 2.10E-01 | 2.58E-01 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 1.18E+01 | 1.82E+00 | 1.92E+00 | 2.87E+00 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 8.42E-01 | 1.82E-01 | 1.87E-01 | 2.58E-01 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.01E+00 | 2.59E-01 | 2.65E-01 | 4.98E-01 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.13E+00 | 1.22E+00 | 1.22E+00 | 1.82E+00 | pCi/g |
| 17-07087-09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 9.28E-01 | 3.34E-01 | 3.38E-01 | 4.86E-01 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



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601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

| Report To: | | Work Order Details: | |
|---|---|---|---|
| Smita Sumbaly | | SDG: | 17-07087 |
| Weston Solutions, Inc. | | Purchase Order: | 0094759 |
| 1090 King Georges Post Rd Suite 201 | | Analysis Category: | ENVIRONMENTAL |
| Edison, NJ 08837 | | Sample Matrix: | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.15E+00 | 1.93E-01 | 2.02E-01 | 4.22E-01 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 5.54E-01 | 4.18E-01 | 4.19E-01 | 6.76E-01 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 1.38E-01 | 6.23E-02 | 6.27E-02 | 9.44E-02 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 2.03E+01 | 2.18E+00 | 2.41E+00 | 9.37E-01 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | -1.77E+00 | 4.79E+00 | 4.79E+00 | 6.56E+00 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.21E+00 | 1.39E-01 | 1.52E-01 | 2.51E-01 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 3.15E+00 | 1.25E+00 | 1.26E+00 | 2.85E+00 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 9.60E-01 | 1.42E-01 | 1.51E-01 | 2.02E-01 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.15E+00 | 1.93E-01 | 2.02E-01 | 4.22E-01 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 2.04E+00 | 1.44E+00 | 1.44E+00 | 2.37E+00 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 9.66E-01 | 1.54E-01 | 1.62E-01 | 1.37E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.06E+00 | 2.05E-01 | 2.12E-01 | 4.07E-01 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 4.19E-01 | 4.70E-01 | 4.70E-01 | 7.83E-01 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 1.22E-02 | 5.07E-02 | 5.07E-02 | 7.80E-02 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 1.86E+01 | 2.25E+00 | 2.44E+00 | 1.08E+00 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 3.72E+00 | 4.77E+00 | 4.77E+00 | 8.13E+00 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.04E+00 | 1.23E-01 | 1.34E-01 | 2.28E-01 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 7.57E+00 | 1.82E+00 | 1.86E+00 | 2.40E+00 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 9.04E-01 | 1.39E-01 | 1.47E-01 | 1.81E-01 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.06E+00 | 2.05E-01 | 2.12E-01 | 4.07E-01 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.10E+00 | 1.16E+00 | 1.16E+00 | 1.94E+00 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 9.56E-01 | 1.54E-01 | 1.62E-01 | 1.05E-01 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

*Report To:*

**Smita Sumbaly**
**Weston Solutions, Inc.**
**1090 King Georges Post Rd Suite 201**
**Edison, NJ 08837**

*Work Order Details:*

| | |
|---|---|
| *SDG:* | **17-07087** |
| *Purchase Order:* | 0094759 |
| *Analysis Category:* | ENVIRONMENTAL |
| *Sample Matrix:* | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.02E+00 | 2.10E-01 | 2.16E-01 | 5.63E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 5.88E-01 | 5.61E-01 | 5.62E-01 | 9.25E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 5.99E-02 | 6.01E-02 | 6.01E-02 | 1.32E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 2.13E+01 | 2.42E+00 | 2.65E+00 | 4.45E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | -6.82E-01 | 6.69E+00 | 6.69E+00 | 9.94E+00 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.20E+00 | 1.47E-01 | 1.59E-01 | 2.27E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 1.58E+01 | 1.95E+00 | 2.11E+00 | 2.88E+00 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 1.07E+00 | 1.83E-01 | 1.91E-01 | 2.71E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.02E+00 | 2.10E-01 | 2.16E-01 | 5.63E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.99E+00 | 1.61E+00 | 1.62E+00 | 2.68E+00 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 9.04E-01 | 1.74E-01 | 1.80E-01 | 1.77E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.02E+00 | 3.02E-01 | 3.07E-01 | 6.21E-01 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | -1.19E-01 | 2.45E-01 | 2.46E-01 | 1.11E+00 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 1.84E-01 | 1.24E-01 | 1.24E-01 | 1.97E-01 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 2.06E+01 | 2.75E+00 | 2.95E+00 | 1.24E+00 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 2.04E-01 | 1.02E+01 | 1.02E+01 | 1.45E+01 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.05E+00 | 1.62E-01 | 1.70E-01 | 3.20E-01 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 3.07E+00 | 1.63E+00 | 1.64E+00 | 3.64E+00 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 9.62E-01 | 2.50E-01 | 2.55E-01 | 3.52E-01 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.02E+00 | 3.02E-01 | 3.07E-01 | 6.21E-01 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.34E+00 | 1.48E+00 | 1.48E+00 | 2.47E+00 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 1.12E+00 | 2.81E-01 | 2.87E-01 | 5.93E-01 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

| Report To: | | Work Order Details: | |
|---|---|---|---|
| Smita Sumbaly | | SDG: | 17-07087 |
| Weston Solutions, Inc. | | Purchase Order: | 0094759 |
| 1090 King Georges Post Rd Suite 201 | | Analysis Category: | ENVIRONMENTAL |
| Edison, NJ 08837 | | Sample Matrix: | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.04E+00 | 1.76E-01 | 1.84E-01 | 3.77E-01 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 9.50E-01 | 4.75E-01 | 4.77E-01 | 7.33E-01 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 1.47E-01 | 7.38E-02 | 7.42E-02 | 1.15E-01 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 1.79E+01 | 1.98E+00 | 2.18E+00 | 1.36E+00 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 4.77E-01 | 4.36E+00 | 4.36E+00 | 6.83E+00 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.17E+00 | 1.34E-01 | 1.46E-01 | 2.00E-01 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 2.97E+00 | 1.14E+00 | 1.15E+00 | 2.24E+00 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 1.01E+00 | 1.52E-01 | 1.61E-01 | 2.02E-01 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.04E+00 | 1.76E-01 | 1.84E-01 | 3.77E-01 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 9.99E-01 | 9.94E-01 | 9.95E-01 | 1.66E+00 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 9.15E-01 | 1.56E-01 | 1.63E-01 | 1.39E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.07E+00 | 2.12E-01 | 2.19E-01 | 3.61E-01 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 7.89E-01 | 4.80E-01 | 4.82E-01 | 8.84E-01 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | -1.83E-02 | 5.07E-02 | 5.07E-02 | 7.23E-02 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 2.16E+01 | 2.45E+00 | 2.69E+00 | 6.25E-01 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 5.99E+00 | 4.65E+00 | 4.66E+00 | 7.41E+00 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.04E+00 | 1.24E-01 | 1.35E-01 | 2.09E-01 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 2.25E+00 | 8.45E-01 | 8.53E-01 | 2.35E+00 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 9.51E-01 | 1.29E-01 | 1.38E-01 | 1.57E-01 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.07E+00 | 2.12E-01 | 2.19E-01 | 3.61E-01 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.06E+00 | 1.28E+00 | 1.28E+00 | 2.15E+00 | pCi/g |
| 17-07087-17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 1.02E+00 | 1.53E-01 | 1.62E-01 | 9.90E-02 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

*Report To:*

Smita Sumbaly
Weston Solutions, Inc.
1090 King Georges Post Rd Suite 201
Edison, NJ 08837

*Work Order Details:*

| | |
|---|---|
| *SDG:* | **17-07087** |
| *Purchase Order:* | 0094759 |
| *Analysis Category:* | ENVIRONMENTAL |
| *Sample Matrix:* | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.05E+00 | 2.10E-01 | 2.17E-01 | 3.45E-01 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 6.09E-01 | 5.01E-01 | 5.02E-01 | 8.15E-01 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | -2.04E-02 | 6.63E-02 | 6.63E-02 | 9.57E-02 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 2.14E+01 | 2.46E+00 | 2.70E+00 | 1.12E+00 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | 6.97E+00 | 6.10E+00 | 6.11E+00 | 1.06E+01 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.15E+00 | 1.47E-01 | 1.58E-01 | 2.38E-01 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 1.62E+01 | 1.93E+00 | 2.11E+00 | 2.83E+00 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 9.23E-01 | 1.84E-01 | 1.90E-01 | 2.43E-01 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.05E+00 | 2.10E-01 | 2.17E-01 | 3.45E-01 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.33E+00 | 1.19E+00 | 1.19E+00 | 1.99E+00 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 9.96E-01 | 1.75E-01 | 1.82E-01 | 1.79E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.14E+00 | 2.96E-01 | 3.01E-01 | 4.66E-01 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 1.58E+00 | 1.02E+00 | 1.03E+00 | 1.63E+00 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | 1.23E-01 | 8.35E-02 | 8.38E-02 | 1.39E-01 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 2.43E+01 | 3.11E+00 | 3.35E+00 | 1.46E+00 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | -7.73E-01 | 1.19E+01 | 1.19E+01 | 1.64E+01 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.73E+00 | 2.40E-01 | 2.56E-01 | 2.64E-01 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 1.83E+01 | 2.39E+00 | 2.57E+00 | 3.61E+00 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 1.25E+00 | 2.55E-01 | 2.63E-01 | 4.51E-01 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.14E+00 | 2.96E-01 | 3.01E-01 | 4.66E-01 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | -4.40E-01 | 1.50E+00 | 1.50E+00 | 2.14E+00 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 1.33E+00 | 4.00E-01 | 4.06E-01 | 5.64E-01 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

*Report To:*

Smita Sumbaly
Weston Solutions, Inc.
1090 King Georges Post Rd Suite 201
Edison, NJ 08837

*Work Order Details:*

| | |
|---|---|
| *SDG:* | **17-07087** |
| *Purchase Order:* | 0094759 |
| *Analysis Category:* | ENVIRONMENTAL |
| *Sample Matrix:* | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Actinium-228 | EPA 901.1 Modified | 1.16E+00 | 1.63E-01 | 1.73E-01 | 2.94E-01 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Bismuth-212 | EPA 901.1 Modified | 9.03E-01 | 5.43E-01 | 5.45E-01 | 8.66E-01 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Cesium-137 | EPA 901.1 Modified | -6.10E-03 | 4.44E-02 | 4.44E-02 | 6.62E-02 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Potassium-40 | EPA 901.1 Modified | 2.38E+01 | 2.47E+00 | 2.76E+00 | 6.32E-01 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Protactinium-234m | EPA 901.1 Modified | -1.76E+00 | 5.27E+00 | 5.27E+00 | 7.67E+00 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Lead-212 | EPA 901.1 Modified | 1.23E+00 | 1.37E-01 | 1.51E-01 | 2.20E-01 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-224 | EPA 901.1 Modified | 3.59E+00 | 1.17E+00 | 1.18E+00 | 2.47E+00 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-226 | EPA 901.1 Modified | 9.02E-01 | 1.24E-01 | 1.32E-01 | 2.14E-01 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Radium-228 | EPA 901.1 Modified | 1.16E+00 | 1.63E-01 | 1.73E-01 | 2.94E-01 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Thorium-234 | EPA 901.1 Modified | 1.49E+00 | 1.11E+00 | 1.11E+00 | 1.49E+00 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Thallium-208 | EPA 901.1 Modified | 1.08E+00 | 1.58E-01 | 1.68E-01 | 1.00E-01 | pCi/g |
| | | | | | | | | | | | | | |
| 17-07087-01 | LCS | KNOWN | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 4.82E+00 | 1.74E-01 | | | pCi/g |
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 5.85E+00 | 9.19E-01 | 1.07E+00 | 9.78E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.31E-02 | 3.15E-02 | 3.15E-02 | 6.59E-02 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 5.19E-01 | 2.12E-01 | 2.17E-01 | 1.03E-01 | pCi/g |
| 17-07087-04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 3.81E-01 | 1.74E-01 | 1.78E-01 | 1.05E-01 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 5.69E-01 | 2.37E-01 | 2.43E-01 | 1.30E-01 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.01E+00 | 2.93E-01 | 3.08E-01 | 9.47E-02 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.30E+00 | 3.65E-01 | 3.85E-01 | 9.86E-02 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.21E+00 | 3.35E-01 | 3.54E-01 | 1.18E-01 | pCi/g |
| 17-07087-09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 5.81E-01 | 2.25E-01 | 2.31E-01 | 1.13E-01 | pCi/g |
| 17-07087-10 | MS | HTC-A03-S002-3036-01 MS | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 7.12E+00 | 1.23E+00 | 1.40E+00 | 1.00E-01 | pCi/g |
| 17-07087-11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 8.01E+00 | 1.50E+00 | 1.67E+00 | 7.89E-02 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 7.13E-01 | 2.20E-01 | 2.30E-01 | 9.14E-02 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.63E+00 | 4.28E-01 | 4.55E-01 | 1.16E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.16E+00 | 3.36E-01 | 3.53E-01 | 7.24E-02 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 8.55E-01 | 2.79E-01 | 2.91E-01 | 1.02E-01 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 7.07E-01 | 2.26E-01 | 2.35E-01 | 7.21E-02 | pCi/g |
| 17-07087-17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.18E+00 | 3.47E-01 | 3.65E-01 | 1.45E-01 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.38E+00 | 4.12E-01 | 4.32E-01 | 8.83E-02 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 5.52E-01 | 1.78E-01 | 1.85E-01 | 6.86E-02 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-228 | EPA 907.0 Modified | 1.47E+00 | 4.69E-01 | 4.89E-01 | 1.78E-01 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

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EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

*Report To:*

**Smita Sumbaly**
**Weston Solutions, Inc.**
**1090 King Georges Post Rd Suite 201**
**Edison, NJ 08837**

*Work Order Details:*

| | |
|---|---|
| *SDG:* | **17-07087** |
| *Purchase Order:* | 0094759 |
| *Analysis Category:* | ENVIRONMENTAL |
| *Sample Matrix:* | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-01 | LCS | KNOWN | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 5.39E+00 | 1.46E-01 | | | pCi/g |
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 6.25E+00 | 9.69E-01 | 1.24E+00 | 9.40E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 7.64E-02 | 7.07E-02 | 7.14E-02 | 6.60E-02 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 4.76E-01 | 1.92E-01 | 2.01E-01 | 8.19E-02 | pCi/g |
| 17-07087-04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 4.31E-01 | 1.77E-01 | 1.85E-01 | 7.19E-02 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 6.50E-01 | 2.48E-01 | 2.61E-01 | 1.31E-01 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 1.81E+00 | 4.38E-01 | 4.92E-01 | 6.13E-02 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 1.07E+00 | 3.10E-01 | 3.38E-01 | 8.95E-02 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 9.52E-01 | 2.73E-01 | 2.98E-01 | 8.39E-02 | pCi/g |
| 17-07087-09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 5.56E-01 | 2.08E-01 | 2.19E-01 | 7.45E-02 | pCi/g |
| 17-07087-10 | MS | HTC-A03-S002-3036-01 MS | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 5.71E+00 | 1.00E+00 | 1.23E+00 | 7.14E-02 | pCi/g |
| 17-07087-11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 6.09E+00 | 1.16E+00 | 1.38E+00 | 5.69E-02 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 6.50E-01 | 2.00E-01 | 2.15E-01 | 7.73E-02 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 1.12E+00 | 3.20E-01 | 3.48E-01 | 1.01E-01 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 1.16E+00 | 3.26E-01 | 3.56E-01 | 6.56E-02 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 8.58E-01 | 2.69E-01 | 2.90E-01 | 7.00E-02 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 8.19E-01 | 2.40E-01 | 2.61E-01 | 5.54E-02 | pCi/g |
| 17-07087-17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 2.39E+00 | 5.59E-01 | 6.32E-01 | 1.11E-01 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 1.13E+00 | 3.51E-01 | 3.78E-01 | 1.10E-01 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 5.62E-01 | 1.73E-01 | 1.87E-01 | 6.22E-02 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-230 | EPA 907.0 Modified | 1.01E+00 | 3.48E-01 | 3.69E-01 | 1.18E-01 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



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EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

| Report To: | |
|---|---|
| Smita Sumbaly | |
| Weston Solutions, Inc. | |
| 1090 King Georges Post Rd Suite 201 | |
| Edison, NJ 08837 | |

| Work Order Details: | |
|---|---|
| SDG: | 17-07087 |
| Purchase Order: | 0094759 |
| Analysis Category: | ENVIRONMENTAL |
| Sample Matrix: | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-01 | LCS | KNOWN | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 4.82E+00 | 1.74E-01 | | | pCi/g |
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 5.79E+00 | 9.10E-01 | 1.04E+00 | 8.04E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 3.93E-02 | 5.48E-02 | 5.49E-02 | 8.28E-02 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 3.03E-01 | 1.52E-01 | 1.54E-01 | 1.11E-01 | pCi/g |
| 17-07087-04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 4.33E-01 | 1.77E-01 | 1.81E-01 | 6.26E-02 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 6.58E-01 | 2.45E-01 | 2.52E-01 | 7.45E-02 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 7.95E-01 | 2.40E-01 | 2.50E-01 | 6.98E-02 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 9.71E-01 | 2.90E-01 | 3.02E-01 | 8.92E-02 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 9.04E-01 | 2.63E-01 | 2.75E-01 | 7.61E-02 | pCi/g |
| 17-07087-09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 4.87E-01 | 1.93E-01 | 1.98E-01 | 8.77E-02 | pCi/g |
| 17-07087-10 | MS | HTC-A03-S002-3036-01 MS | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 6.01E+00 | 1.05E+00 | 1.18E+00 | 6.79E-02 | pCi/g |
| 17-07087-11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 6.77E+00 | 1.27E+00 | 1.41E+00 | 5.68E-02 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 6.94E-01 | 2.08E-01 | 2.17E-01 | 7.72E-02 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 1.13E+00 | 3.22E-01 | 3.37E-01 | 9.77E-02 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 1.26E+00 | 3.45E-01 | 3.62E-01 | 5.72E-02 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 9.20E-01 | 2.83E-01 | 2.94E-01 | 9.20E-02 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 8.25E-01 | 2.42E-01 | 2.52E-01 | 6.52E-02 | pCi/g |
| 17-07087-17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 1.47E+00 | 3.88E-01 | 4.09E-01 | 9.25E-02 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 1.03E+00 | 3.26E-01 | 3.38E-01 | 8.77E-02 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 9.40E-01 | 2.40E-01 | 2.54E-01 | 4.96E-02 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/23/2017 | 17-07087 | Thorium-232 | EPA 907.0 Modified | 1.07E+00 | 3.62E-01 | 3.74E-01 | 9.39E-02 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

| Report To: | |
|---|---|
| Smita Sumbaly | |
| Weston Solutions, Inc. | |
| 1090 King Georges Post Rd Suite 201 | |
| Edison, NJ 08837 | |

| Work Order Details: | |
|---|---|
| SDG: | 17-07087 |
| Purchase Order: | 0094759 |
| Analysis Category: | ENVIRONMENTAL |
| Sample Matrix: | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-01 | LCS | KNOWN | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 7.34E+00 | 2.64E-01 | | | pCi/g |
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 6.39E+00 | 8.72E-01 | 9.85E-01 | 7.61E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 8.27E-02 | 6.52E-02 | 6.55E-02 | 5.93E-02 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 6.13E-01 | 1.69E-01 | 1.75E-01 | 6.44E-02 | pCi/g |
| 17-07087-04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 5.78E-01 | 1.87E-01 | 1.92E-01 | 8.06E-02 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 3.50E-01 | 1.12E-01 | 1.15E-01 | 5.12E-02 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 1.07E+00 | 2.30E-01 | 2.42E-01 | 6.29E-02 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 6.75E-01 | 2.42E-01 | 2.47E-01 | 8.09E-02 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 1.21E+00 | 2.61E-01 | 2.75E-01 | 5.99E-02 | pCi/g |
| 17-07087-09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 5.79E-01 | 1.98E-01 | 2.02E-01 | 7.34E-02 | pCi/g |
| 17-07087-10 | MS | HTC-A03-S002-3036-01 MS | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 6.56E+00 | 1.01E+00 | 1.12E+00 | 1.09E-01 | pCi/g |
| 17-07087-11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 6.88E+00 | 9.93E-01 | 1.11E+00 | 8.42E-02 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 6.91E-01 | 2.13E-01 | 2.19E-01 | 6.93E-02 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 8.38E-01 | 2.22E-01 | 2.30E-01 | 6.42E-02 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 7.71E-01 | 2.31E-01 | 2.37E-01 | 1.00E-01 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 7.26E-01 | 1.92E-01 | 1.99E-01 | 6.47E-02 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 1.15E+00 | 2.73E-01 | 2.85E-01 | 6.14E-02 | pCi/g |
| 17-07087-17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 1.13E+00 | 2.56E-01 | 2.68E-01 | 5.98E-02 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 7.94E-01 | 1.97E-01 | 2.05E-01 | 6.41E-02 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 7.76E-01 | 2.03E-01 | 2.10E-01 | 4.70E-02 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-233/234 | EPA 908.0 Modified | 1.05E+00 | 2.28E-01 | 2.40E-01 | 5.36E-02 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

*Report To:*

**Smita Sumbaly**
**Weston Solutions, Inc.**
**1090 King Georges Post Rd Suite 201**
**Edison, NJ 08837**

*Work Order Details:*

| | |
|---|---|
| *SDG:* | **17-07087** |
| *Purchase Order:* | 0094759 |
| *Analysis Category:* | ENVIRONMENTAL |
| *Sample Matrix:* | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 5.71E-01 | 1.93E-01 | 1.97E-01 | 8.41E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | -5.21E-03 | 3.09E-02 | 3.09E-02 | 7.32E-02 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | -8.58E-03 | 2.61E-02 | 2.61E-02 | 7.11E-02 | pCi/g |
| 17-07087-04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 4.97E-02 | 6.52E-02 | 6.53E-02 | 9.94E-02 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 5.85E-02 | 4.87E-02 | 4.89E-02 | 4.19E-02 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 4.31E-02 | 4.67E-02 | 4.68E-02 | 5.63E-02 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 6.36E-02 | 8.24E-02 | 8.25E-02 | 1.14E-01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | -6.68E-03 | 2.68E-02 | 2.68E-02 | 6.87E-02 | pCi/g |
| 17-07087-09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 2.84E-03 | 3.97E-02 | 3.97E-02 | 1.13E-01 | pCi/g |
| 17-07087-10 | MS | HTC-A03-S002-3036-01 MS | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 5.00E-01 | 2.05E-01 | 2.08E-01 | 1.03E-01 | pCi/g |
| 17-07087-11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 4.25E-01 | 1.77E-01 | 1.80E-01 | 9.10E-02 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 1.48E-02 | 3.56E-02 | 3.56E-02 | 7.46E-02 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 9.80E-02 | 7.96E-02 | 7.99E-02 | 7.92E-02 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 9.92E-02 | 8.81E-02 | 8.84E-02 | 9.48E-02 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 9.99E-02 | 7.52E-02 | 7.55E-02 | 7.00E-02 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 1.08E-01 | 8.32E-02 | 8.36E-02 | 6.61E-02 | pCi/g |
| 17-07087-17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 9.12E-02 | 7.40E-02 | 7.43E-02 | 7.38E-02 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 1.44E-02 | 3.61E-02 | 3.61E-02 | 7.52E-02 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 6.95E-02 | 6.72E-02 | 6.74E-02 | 8.33E-02 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 7.03E-02 | 6.13E-02 | 6.15E-02 | 7.03E-02 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

| Report To: | |
|---|---|
| Smita Sumbaly | |
| Weston Solutions, Inc. | |
| 1090 King Georges Post Rd Suite 201 | |
| Edison, NJ 08837 | |

| Work Order Details: | |
|---|---|
| SDG: | 17-07087 |
| Purchase Order: | 0094759 |
| Analysis Category: | ENVIRONMENTAL |
| Sample Matrix: | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 5.71E-01 | 1.93E-01 | 1.97E-01 | 8.41E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | -5.21E-03 | 3.09E-02 | 3.09E-02 | 7.32E-02 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | -8.58E-03 | 2.61E-02 | 2.61E-02 | 7.11E-02 | pCi/g |
| 17-07087-04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 4.97E-02 | 6.52E-02 | 6.53E-02 | 9.94E-02 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 5.85E-02 | 4.87E-02 | 4.89E-02 | 4.19E-02 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 4.31E-02 | 4.67E-02 | 4.68E-02 | 5.63E-02 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 6.36E-02 | 8.24E-02 | 8.25E-02 | 1.14E-01 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | -6.68E-03 | 2.68E-02 | 2.68E-02 | 6.87E-02 | pCi/g |
| 17-07087-09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 2.84E-03 | 3.97E-02 | 3.97E-02 | 1.13E-01 | pCi/g |
| 17-07087-10 | MS | HTC-A03-S002-3036-01 MS | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 5.00E-01 | 2.05E-01 | 2.08E-01 | 1.03E-01 | pCi/g |
| 17-07087-11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 4.25E-01 | 1.77E-01 | 1.80E-01 | 9.10E-02 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 1.48E-02 | 3.56E-02 | 3.56E-02 | 7.46E-02 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 9.80E-02 | 7.96E-02 | 7.99E-02 | 7.92E-02 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 9.92E-02 | 8.81E-02 | 8.84E-02 | 9.48E-02 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 9.99E-02 | 7.52E-02 | 7.55E-02 | 7.00E-02 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 1.08E-01 | 8.32E-02 | 8.36E-02 | 6.61E-02 | pCi/g |
| 17-07087-17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 9.12E-02 | 7.40E-02 | 7.43E-02 | 7.38E-02 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 1.44E-02 | 3.61E-02 | 3.61E-02 | 7.52E-02 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 6.95E-02 | 6.72E-02 | 6.74E-02 | 8.33E-02 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-235/236 | EPA 908.0 Modified | 7.03E-02 | 6.13E-02 | 6.15E-02 | 7.03E-02 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# Eberline Analytical
## Final Report of Analysis

*Report To:*

**Smita Sumbaly**
**Weston Solutions, Inc.**
**1090 King Georges Post Rd Suite 201**
**Edison, NJ 08837**

*Work Order Details:*

| | |
|---|---|
| *SDG:* | **17-07087** |
| *Purchase Order:* | 0094759 |
| *Analysis Category:* | ENVIRONMENTAL |
| *Sample Matrix:* | SO |

| Lab ID | Sample Type | Client ID | Sample Date | Receipt Date | Analysis Date | Batch ID | Analyte | Method | Result | CU | CSU | MDA | Report Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17-07087-01 | LCS | KNOWN | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 7.11E+00 | 2.56E-01 | | | pCi/g |
| 17-07087-01 | LCS | SPIKE | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 6.29E+00 | 8.61E-01 | 9.71E-01 | 7.93E-02 | pCi/g |
| 17-07087-02 | MBL | BLANK | 07/19/17 00:00 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 4.94E-02 | 5.44E-02 | 5.45E-02 | 7.41E-02 | pCi/g |
| 17-07087-03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 3.53E-01 | 1.24E-01 | 1.26E-01 | 4.87E-02 | pCi/g |
| 17-07087-04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 3.72E-01 | 1.45E-01 | 1.48E-01 | 5.58E-02 | pCi/g |
| 17-07087-05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 3.44E-01 | 1.11E-01 | 1.13E-01 | 4.25E-02 | pCi/g |
| 17-07087-06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 7.75E-01 | 1.88E-01 | 1.96E-01 | 4.99E-02 | pCi/g |
| 17-07087-07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 5.72E-01 | 2.21E-01 | 2.24E-01 | 9.22E-02 | pCi/g |
| 17-07087-08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 1.08E+00 | 2.41E-01 | 2.53E-01 | 4.41E-02 | pCi/g |
| 17-07087-09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 2.96E-01 | 1.39E-01 | 1.41E-01 | 8.63E-02 | pCi/g |
| 17-07087-10 | MS | HTC-A03-S002-3036-01 MS | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 7.18E+00 | 1.09E+00 | 1.20E+00 | 1.13E-01 | pCi/g |
| 17-07087-11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 6.49E+00 | 9.47E-01 | 1.05E+00 | 6.69E-02 | pCi/g |
| 17-07087-12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 7.36E-01 | 2.22E-01 | 2.28E-01 | 8.65E-02 | pCi/g |
| 17-07087-13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 7.25E-01 | 2.03E-01 | 2.10E-01 | 6.39E-02 | pCi/g |
| 17-07087-14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 5.17E-01 | 1.85E-01 | 1.89E-01 | 1.04E-01 | pCi/g |
| 17-07087-15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 7.82E-01 | 2.00E-01 | 2.07E-01 | 5.15E-02 | pCi/g |
| 17-07087-16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 9.46E-01 | 2.43E-01 | 2.52E-01 | 7.67E-02 | pCi/g |
| 17-07087-17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 9.13E-01 | 2.24E-01 | 2.33E-01 | 5.95E-02 | pCi/g |
| 17-07087-18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 8.63E-01 | 2.06E-01 | 2.15E-01 | 6.07E-02 | pCi/g |
| 17-07087-19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 9.61E-01 | 2.30E-01 | 2.40E-01 | 5.36E-02 | pCi/g |
| 17-07087-20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 7/18/2017 | 8/22/2017 | 17-07087 | Uranium-238 | EPA 908.0 Modified | 9.43E-01 | 2.13E-01 | 2.24E-01 | 6.49E-02 | pCi/g |

CU=Counting Uncertainty;CSU=Combined Standard Uncertainty (2-sigma);MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original



EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
601 SCARBORO ROAD OAK RIDGE, TN 37830 865/481-0683 FAX 865/483-4621

# SECTION V

# ANALYTICAL STANDARD

QA/QC REVIEWED
Date 1/16/95 Initials [illegible]

U-8

# CERTIFICATE OF CALIBRATION
# ALPHA STANDARD SOLUTION

| | | | |
|---|---|---|---|
| Radionuclide: | U-238NAT | Customer: | TMA EBERLINE |
| Half Life: | (4.468 ± 0.005) x 10^9 years | P.O.No.: | OR2778 |
| Catalog No.: | 7338 | Reference Date: | January 1 1995 12:00 PST. |
| Source No.: | 479-50 | Contained Radioactivity: | (Total U) 8.016 μCi |
| | | Contained Radioactivity: | (Total U) 297 kBq |

Description of Solution

a. Mass of solution: 65.2896 g in a 50 ml flame sealed ampoule

b. Chemical form: Uranyl Nitrate in H2O

c. Carrier content: None

d. Density: Approximately 1.3202 g/ml @ 20°C.

Radioimpurities: Refer to attached technical data sheet

Radioactive Daughters: Refer to attached technical data sheet

Radionuclide Concentration

(Total U) 0.1228 μCi/g.

Method of Calibration

Activity calculations are based upon known specific activity and mass.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration: ±3.0%

b. Random uncertainty in assay: ±0.0%

c. Random uncertainty in weighing(s): ±2.0%

d. Total uncertainty at the 99% confidence level: ±3.6%

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).

ERIC ALLAS
QUALITY CONTROL

29 DECEMBER 1994
Date Signed

ISOTOPE PRODUCTS LABORATORIES
3017 N. SAN FERNANDO BLVD.
BURBANK, CALIFORNIA 91504
818·843·7000 FAX 818·843·6168

EBERLINE SERVICES

# QUALITY CONTROL PROGRAM
MP-009

Rev.8; 11/01/03
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE SOLUTIONS
## *PRIMARY DILUTION RECERTIFICATION*
## MP 009

CURRENT DATE: 7/12/2017 0:00

SOLUTION REFERENCE #: IPL 479-50

SOLUTION #: U-8

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{234,235,238}U$ | 4.468E+09 | 1.632E+12 |

Radionuclide: $^{234,235,238}U$

Reference Date: 1/1/1995 0:00

Certified Activity: 8.016E+00 µCi

Certified Concentration: µCi per gram

| | | |
|---|---|---|
| Ampoule /Solution Gross | 97.6400 | Weight, Grams |
| Empty Ampoule | 32.5020 | Weight, Grams |
| Solution Net | 65.1380 | Weight, Grams |
| Total Activity in Ampoule | 8.0160 | µCi |

**Chemical Composition of Standard Solution**

Uranyl nitrate in dilute $HNO_3$

**Dilution Instructions:**

Dilution Solvent Used: 1M $HNO_3$

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 8.0160 µCi Which Equals 1.780E+07 dpm at the date listed above

And after dilution the activity of this solution is 1.77955E+04 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: June 28, 2018

Verified & Approved By _____ Date: 7/12/2017 0:00

QC Approval _____ Date: 7/25/17

EBERLINE SERVICES

**QUALITY CONTROL PROGRAM**
MP-009

Rev.8; 11/01/03
Title: **Radioactive Reference Standards Solutions & Records**

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE STANDARD SOLUTIONS
*SECONDARY DILUTION RECERTIFICATION*

MP-009
**Solution Reference #** IPL 479-50
**Date** 7/12/2017 0:00
**Solution #** U-8a

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{234, 235, 238}U$ | 4.468E+09 | 1.632E+12 |

**Radionuclide of Interest** $^{234, 235, 238}U$
**Parent Solution Conc.** 1.7796E+04 dpm/ml
**Reference Date** 1/1/1995 0:00

**Chemical Composition of Standard Solution**
Uranly Nitrate in 1M $HNO_3$

**Dilution Instructions:**
**Dilution Solvent Used** 1M $HNO_3$

*SECONDARY VOLUMETRIC DILUTION*

**Vol. Parent Solution:** 4.0000 ml
**Total Activity:** 7.1182E+04 dpm
**Final Volume:** 1000.00 ml

**Final Activity Concentration:** 7.1182E+01 dpm/ml

**This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.**

**NOTES:**

Isotopic Distribution as:
U-238 Atom % = 48.239 U-238 = 71.182 dpm/ml X 0.48249 = 34.345 dpm/ml
U-235 Atom % = 2.25 U-235 = 71.182 dpm/ml X 0.0225 = 1.602 dpm/ml
U-234 Atom % = 49.501 U-238 = 71.182 dpm/ml X 0.49501 = 35.236 dpm/ml
All values +/- 3.6%

Isotopic ratios from manufacturer's data sheet

**Expiration Date:** June 28, 2018

Verified & Approved By _____ Date: 7/12/2017 0:00

QC Approval _____ Date: 7/25/17

RECORD COPY

# Tracer Solution for Environmental Analysis & Disequilibrium Studies

## Product Description & Measurement Certificate

| | | | |
|---|---|---|---|
| *Description* | Principal radionuclide: | **uranium 232** (U-232) | Product code: **UDP10050** |
| | Daughter Nuclide: | Th-228 | Batch Number: 92/232/67 |

| | | |
|---|---|---|
| *Measurement* | Reference date: | 01 March 2000 |
| | Radioactive concentration U-232 | 6.739E+03 becquerels per gram of solution |
| | which is equivalent to | 1.821E-01 microcuries per gram of solution |
| | Mass of solution | 5.356 grams |
| | Volume of solution | 5.035 millilitres |
| | Total activity of U-232 | 3.61E+04 becquerels |
| | which is equivalent to | 9.76E-01 microcuries |

Method of measurement (see reverse of this certificate)

*Accuracy* Random uncertainty is: ± 0.7% Systematic uncertainty: ± 0.5%
Overall uncertainty in the radioactive concentration quoted above: ± 1.7%
Overall uncertainty is defined on the reverse of this certificate.

*Radionuclidic Purity* Any radioactive impurities measured are listed below, expressed as percentages of the activity of the principle radionuclide at the reference date .

Th-228 and daughter activity removed 2 Feb 2000
U-232 daughters activity will increase with time. By alpha 88% U-232, 12% daughters on 1/3/00

*Isotopic Purity* The isotopic composition, expressed as atom per cent at the reference date .

Not measured

*Chemical Composition* Calculated weight of U-232, 4.42E-08 grams, as 2M HNO3 solution in a flame sealed glass vial.
This Tracer solution has been produced 'carrier free'.

*Physical Data* Recommended half life of uranium 232: 6.980E+01 years
Principle energies of alpha emissions (MeV): 5.263 31.7%, 5.320 68.0%
Branching ratio for alpha emission: 100%
Calculated specific activity of uranium 232: 8.167E+05 Bq per microgram U-232.

*Remarks* For safety information and notes to ensure correct usage by all persons handling this radioactive Tracer solution please read the instructions accompanying the package.

AEA Technology operates a quality management system which has been independently audited and approved to ISO 9001.

Approved Signatory

Roger Wiltshire

Project Ref. AE2315

Roger Wiltshire

Prepared and characterised in the UK, for world wide distribution by **Isotrak, AEA Technology, QSA.**

EBERLINE SERVICES

# QUALITY CONTROL PROGRAM
MP-009

Rev.8; 11/01/03
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE SOLUTIONS
## *PRIMARY DILUTION RECERTIFICATION*
## MP 009

CURRENT DATE: 11/7/2016 0:00

SOLUTION REFERENCE #: AEA/Amersham 92/232/67 SOLUTION #: U-10

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{232}U$ | 7.200E+01 | 2.630E+04 |

Radionuclide: $^{232}U$

Reference Date: 3/1/2000 0:00

Certified Activity: 9.760E-01 µCi

Certified Concentration: µCi per gram

Ampoule /Solution Gross: Weight, Grams

Empty Ampoule: Weight, Grams

Solution Net: Weight, Grams

Total Activity in Ampoule: 0.9760 µCi

Chemical Composition of Standard Solution

$^{232}U(NO_3)_6$ in 2M $HNO_3$

Dilution Instructions:

Dilution Solvent Used: 2M $HNO_3$

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 0.9760 µCi Which Equals 2.167E+06 dpm at the date listed above

And after dilution the activity of this solution is 2.167E+03 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: October 7, 2017

Verified & Approved By _____ Date: 11/7/2016 0:00

QC Approval _____ Date: 11/10/16

EBERLINE SERVICES

**QUALITY CONTROL PROGRAM**
MP-009

Rev.8; 11/01/03
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE STANDARD SOLUTIONS
*SECONDARY DILUTION RECERTIFICATION*

MP-009
**Solution Reference #** AEA/Amersham 92/232/67
**Date** 11/7/2016 0:00
**Solution #** U-10a

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{232}U$ | 7.200E+01 | 2.630E+04 |

**Radionuclide of Interest** $^{232}U$
**Parent Solution Conc.** 2.167E+03 dpm/ml
**Reference Date** 3/1/2000 0:00

**Chemical Composition of Standard Solution**
$^{232}U(NO_3)_6$ in 2M $HNO_3$

**Dilution Instructions:**
**Dilution Solvent Used** 2M $HNO_3$

*SECONDARY VOLUMETRIC DILUTION*

**Vol. Parent Solution:** 10.0000 ml
**Total Activity:** 2.1670E+04 dpm
**Final Volume:** 1000.00 ml

**Final Activity Concentration:** 2.1670E+01 dpm/ml

**NOTES:**

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

**Expiration Date:** October 7, 2017

Verified & Approved By _____ Date: 11/7/2016 0:00

QC Approval _____ Date: 11/10/16

Th-18

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

# CERTIFICATE OF CALIBRATION
# ALPHA STANDARD SOLUTION

| | | | |
|---|---|---|---|
| **Radionuclide:** | Th-229 | **Customer:** | EBERLINE SERVICES |
| **Half-life:** | 7340 ± 160 years | **P.O. No.:** | 00009633 |
| **Catalog No.:** | 7229 | **Reference Date:** | 15-Jan-02 12:00 PST |
| **Source No.:** | 867-54 | **Contained Radioactivity: (Th-229 only)** | 1.013 µCi 37.48 kBq |

**Physical Description:**

A. Mass of solution: 5.0147 g in 5 mL flame-sealed ampoule
B. Chemical form: $Th(NO_3)_4$ in 0.1M $HNO_3$
C. Carrier content: 10µg Th/mL
D. Density: 1.0016 g/mL @ 20°C.

**Radioimpurities:**

None detected (daughters in equilibrium)

**Radionuclide Concentration:** 0.2020 µCi/g, 7.474 kBq/g

**Method of Calibration:**

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using gamma ray spectrometry.
Peak energy used for integration: 193.5 keV
Branching ratio used: 0.0441 gammas per decay

**Uncertainty of Measurement:**

A. Type A (random) uncertainty: ± 0.7 %
B. Type B (systematic) uncertainty: ± 3.0 %
C. Uncertainty in aliquot weighing: ± 0.0 %
D. Total uncertainty at the 99% confidence level: ± 3.1 %

**Notes:**

- See reverse side for leak test(s) performed on this source.
- IPL participates in a 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).
- Nuclear data was taken from IAEA Technical Report Series No. 261.
- This solution has a working life of 5 years.

Ann U Khan — Quality Control

9-Jan-02 — Date Signed

IPL Ref. No.: 867-54

EBERLINE SERVICES

# QUALITY CONTROL PROGRAM
MP-009

Rev.8; 1/10/03
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE SOLUTIONS
## *PRIMARY DILUTION RECERTIFICATION*
## MP 009

CURRENT DATE: 8/16/2017 0:00

SOLUTION REFERENCE #: IPL 867-54 SOLUTION #: Th-18

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{229}$Th | 7.340E+03 | 2.681E+06 |

Radionuclide: $^{229}$Th
Reference Date: 1/15/2002 0:00
Certified Activity: 1.013E+00 µCi
Certified Concentration: µCi per gram

Ampoule /Solution Gross: 8.7752 Weight, Grams
Empty Ampoule: 3.7591 Weight, Grams
Solution Net: 5.0161 Weight, Grams
Total Activity in Ampoule: 1.0130 µCi

**Chemical Composition of Standard Solution**
$^{229}Th(NO_3)_4$ in 0.1M $HNO_3$

**Dilution Instructions:**

Dilution Solvent Used: 0.1 M $HNO_3$

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 1.0130 µCi Which Equals 2.249E+06 dpm at the date listed above

And after dilution the activity of this solution is 2.249E+03 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: August 11, 2018

Verified & Approved By _____ Date: 8/16/2017 0:00

QC Approval _____ Date: 8/16/17

EBERLINE SERVICES

**QUALITY CONTROL PROGRAM**
MP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE STANDARD SOLUTIONS
*SECONDARY DILUTION RECERTIFICATION*

MP-009
Solution Reference # IPL 867-54

Date 8/16/2017 0:00
Solution # Th-18a

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{229}Th$ | 7.340E+03 | 2.681E+06 |

Radionuclide of Interest $^{229}Th$
Parent Solution Conc. 2.25E+03 dpm/ml

Reference Date 1/15/2002 0:00

Chemical Composition of Standard Solution
$TH(NO_3)_4$ in 0.1M $HNO_3$

Dilution Instructions:

Dilution Solvent Used 0.1M $HNO_3$

*SECONDARY VOLUMETRIC DILUTION*

Vol. Parent Solution: 10.0000 ml
Total Activity: 2.2490E+04 dpm
Final Volume: 1000.00 ml

Final Activity Concentration: 2.2490E+01 dpm/ml

NOTES:

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: August 11, 2018

Verified & Approved By _____ Date: 8/16/2017 0:00

QC Approval _____ Date: 8/16/17

QA/QC REVIEWED
Date 10/14/91 Initials WT

# CERTIFICATE OF CALIBRATION
# ALPHA STANDARD SOLUTION

Received
OCT 14 1991
TMA/Eberline
Oak Ridge Lab

| | | | |
|---|---|---|---|
| Radionuclide | Th-230 | Customer: | TMA EBERLINE |
| Half Life: | (7.54 ± 0.03) x 10^4 years | P.O.No.: | TT4944 |
| Catalog No.: | 7230 | Reference Date: | November 1 1991 12:00 PST. |
| Source No.: | 388-116 | Contained Radioactivity: | 1.036 µCi. |

**Description of Solution**

a. Mass of solution: 5.0042 grams.
b. Chemical form: Th(NO3)4 in 0.1N HNO3
c. Carrier content: None added
d. Density: 1.0016 gram/ml @ 20°C.

**Radioimpurities**

See attached technical data sheet

**Radioactive Daughters**

See attached technical data sheet

**Radionuclide Concentration**

0.207 µCi/gram.

**Method of Calibration**

Weighed aliquots of the solution were assayed using a liquid scintillation counter.

**Uncertainty of Measurement**

a. Systematic uncertainty in instrument calibration: ±2.0%
b. Random uncertainty in assay: ±0.5%
c. Random uncertainty in weighing(s): ±0.2%
d. Total uncertainty at the 99% confidence level: ±2.7%

**NIST Traceability**

This calibration is implicitly traceable to the National Institute of Standards and Technology.

**Notes**

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
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)

QUALITY CONTROL

ISOTOPE PRODUCTS LABORATORIES
1800 No. Keystone Street.,
Burbank, California 91504
(818) 843 - 7000

EBERLINE SERVICES

# QUALITY CONTROL PROGRAM
MP-009

Rev.14; 10/10/2012
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE SOLUTIONS
*PRIMARY DILUTION RECERTIFICATION*
MP 009

CURRENT DATE: 2/28/2017 0:00

SOLUTION REFERENCE #: IPL 388-116 SOLUTION #: Th-1

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{230}$Th | 7.540E+04 | 2.754E+07 |

Radionuclide: $^{230}$Thorium
Reference Date: 11/1/1991 0:00
Certified Activity: 1.036E+00 µCi
Certified Concentration: µCi per gram

| | | |
|---|---|---|
| Ampoule /Solution Gross | 9.2660 | Weight, Grams |
| Empty Ampoule | 4.6218 | Weight, Grams |
| Solution Net | 4.6442 | Weight, Grams |
| Total Activity in Ampoule | 1.0360 | µCi |

Chemical Composition of Standard Solution
$^{230}Th(NO_3)_4$ in 0.1N $HNO_3$

Dilution Instructions:
Dilution Solvent Used: 0.1N $HNO_3$

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 1.0360 µCi Which Equals 2.300E+06 dpm at the date listed above

And after dilution the activity of this solution is 2.300E+03 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: February 1, 2018

Recertified By _____ Date: 2/28/2017 0:00

QC Approval _____ Date: 3/1/17

EBERLINE SERVICES

**QUALITY CONTROL PROGRAM**
MP-009

Rev.14; 10/10/2012
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE STANDARD SOLUTIONS
*SECONDARY DILUTION RECERTIFICATION*

**MP-009**

**Solution Reference #** IPL 388-116 **Date** 2/28/2017 0:00
**Solution #** Th-1b

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{230}$Th | 7.540E+04 | 2.754E+07 |

**Radionuclide of Interest** $^{230}$Thorium **Reference Date** 11/1/1991 0:00
**Parent Solution Conc.** 2.30E+03 **dpm/ml**

**Chemical Composition of Standard Solution**
$^{230}Th(NO_3)_4$ in 0.1N $HNO_3$

**Dilution Instructions:** **Dilution Solvent Used** 0.1N $HNO_3$

*SECONDARY VOLUMETRIC DILUTION*

**Vol. Parent Solution:** 10.0000 **ml**
**Total Activity:** 2.2999E+04 **dpm**
**Final Volume:** 1000.00 **ml**

**Final Activity Concentration:** 2.2999E+01 **dpm/ml**

**NOTES:**

**This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.**

**Expiration Date:** February 1, 2018

Recertified By _____ Date: 2/28/2017 0:00

QC Approval _____ Date: 3/1/17

Th-18

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

# CERTIFICATE OF CALIBRATION
# ALPHA STANDARD SOLUTION

| | | | |
|---|---|---|---|
| **Radionuclide:** | Th-229 | **Customer:** | EBERLINE SERVICES |
| **Half-life:** | 7340 ± 160 years | **P.O. No.:** | 00009633 |
| **Catalog No.:** | 7229 | **Reference Date:** | 15-Jan-02 12:00 PST |
| **Source No.:** | 867-54 | **Contained Radioactivity: (Th-229 only)** | 1.013 µCi 37.48 kBq |

**Physical Description:**

A. Mass of solution: 5.0147 g in 5 mL flame-sealed ampoule
B. Chemical form: $Th(NO_3)_4$ in 0.1M $HNO_3$
C. Carrier content: 10µg Th/mL
D. Density: 1.0016 g/mL @ 20°C.

**Radioimpurities:**

None detected (daughters in equilibrium)

**Radionuclide Concentration:** 0.2020 µCi/g, 7.474 kBq/g

**Method of Calibration:**

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using gamma ray spectrometry.

Peak energy used for integration: 193.5 keV
Branching ratio used: 0.0441 gammas per decay

**Uncertainty of Measurement:**

A. Type A (random) uncertainty: ± 0.7 %
B. Type B (systematic) uncertainty: ± 3.0 %
C. Uncertainty in aliquot weighing: ± 0.0 %
D. Total uncertainty at the 99% confidence level: ± 3.1 %

**Notes:**

- See reverse side for leak test(s) performed on this source.
- IPL participates in a 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).
- Nuclear data was taken from IAEA Technical Report Series No. 261.
- This solution has a working life of 5 years.

Quality Control — 9-Jan-02 Date Signed — IPL Ref. No.: 867-54

EBERLINE SERVICES

# QUALITY CONTROL PROGRAM
MP-009

Rev.8; 1/10/03
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE SOLUTIONS
*PRIMARY DILUTION RECERTIFICATION*
MP 009

CURRENT DATE: 8/16/2017 0:00

SOLUTION REFERENCE #: IPL 867-54 SOLUTION #: Th-18

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{229}Th$ | 7.340E+03 | 2.681E+06 |

Radionuclide: $^{229}Th$
Reference Date: 1/15/2002 0:00
Certified Activity: 1.013E+00 µCi
Certified Concentration: µCi per gram

Ampoule /Solution Gross: 8.7752 Weight, Grams
Empty Ampoule: 3.7591 Weight, Grams
Solution Net: 5.0161 Weight, Grams
Total Activity in Ampoule: 1.0130 µCi

**Chemical Composition of Standard Solution**
$^{229}Th(NO_3)_4$ in 0.1M $HNO_3$

**Dilution Instructions:**

Dilution Solvent Used: 0.1 M $HNO_3$

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 1.0130 µCi Which Equals 2.249E+06 dpm at the date listed above

And after dilution the activity of this solution is 2.249E+03 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: August 11, 2018

Verified & Approved By _____ Date: 8/16/2017 0:00

QC Approval _____ Date: 8/16/17

EBERLINE SERVICES

**QUALITY CONTROL PROGRAM**
MP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

## EBERLINE SERVICES - OAK RIDGE LABORATORY
## RADIOACTIVE REFERENCE STANDARD SOLUTIONS
*SECONDARY DILUTION RECERTIFICATION*

MP-009
Solution Reference # IPL 867-54

Date 8/16/2017 0:00
Solution # Th-18a

| Principal Radionuclide | Half Life, Years | Half Life, Days |
|---|---|---|
| $^{229}Th$ | 7.340E+03 | 2.681E+06 |

Radionuclide of interest $^{229}Th$
Parent Solution Conc. 2.25E+03 dpm/ml

Reference Date 1/15/2002 0:00

Chemical Composition of Standard Solution
$TH(NO_3)_4$ in 0.1M $HNO_3$

Dilution Instructions:

Dilution Solvent Used 0.1M $HNO_3$

*SECONDARY VOLUMETRIC DILUTION*

Vol. Parent Solution: 10.0000 ml
Total Activity: 2.2490E+04 dpm
Final Volume: 1000.00 ml

Final Activity Concentration: 2.2490E+01 dpm/ml

NOTES:

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: August 11, 2018

Verified & Approved By _____ Date: 8/16/2017 0:00

QC Approval _____ Date: 8/16/17

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.ezag.com

# CERTIFICATE OF CALIBRATION

## Standard Reference Source

GAS - 1602

**SRS Number:** 104852
**Source Description:** Sand in 16 Ounce PP Omega Jar Filled to Capacity
**Product Code:** 8401-EG-SAN
**Customer:** Eberline Analytical Corporation
**P.O. Number:** OR-1610009, Item 4

This standard radionuclide source was prepared from an aliquot measured gravimetrically from a master radionuclide solution calibrated with a germanium gamma-ray spectrometer system. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using germanium gamma-ray spectrometry. 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. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

**Reference Date:** 01-October-2016 12:00 PM EST

**MGS Mixture**

| Isotope | Gamma-Ray Energy, keV | Half-Life, d | Activity, Bq | Flux, $s^{-1}$ | Uncertainty $u_A$, % | $u_B$, % | $U$, %* | Calibration Method** |
|---|---|---|---|---|---|---|---|---|
| Am-241 | 59.5 | 1.580E+05 | 5.500E+03 | 1.976E+03 | 0.1 | 1.8 | 3.6 | 4π LS |
| Cd-109 | 88.0 | 4.614E+02 | 7.668E+04 | 2.837E+03 | 0.5 | 2.0 | 4.1 | HPGe |
| Co-57 | 122.1 | 2.717E+02 | 2.270E+03 | 1.917E+03 | 0.4 | 1.7 | 3.4 | HPGe |
| Ce-139 | 165.9 | 1.376E+02 | 2.655E+03 | 2.124E+03 | 0.4 | 1.7 | 3.6 | HPGe |
| Hg-203 | 279.2 | 4.659E+01 | 6.003E+03 | 4.947E+03 | 0.3 | 1.7 | 3.5 | HPGe |
| Sn-113 | 391.7 | 1.151E+02 | 4.528E+03 | 2.942E+03 | 0.4 | 1.9 | 3.9 | HPGe |
| Cs-137 | 661.7 | 1.099E+02 | 2.249E+03 | 1.914E+03 | 0.7 | 1.9 | 4.1 | HPGe |
| Y-88 | 898.0 | 1.066E+02 | 7.415E+03 | 6.948E+03 | 0.7 | 1.7 | 3.7 | HPGe |
| Y-88 | 1836.1 | | | 7.356E+03 | 0.7 | 1.7 | 3.7 | |
| Co-60 | 1173.2 | 1.925E+03 | 3.562E+03 | 3.557E+03 | 0.7 | 1.8 | 3.9 | HPGe |
| Co-60 | 1332.5 | | | 3.561E+03 | 0.7 | 1.8 | 3.9 | |

Mixed Gamma (MGS) master solution is EZA's eight isotope mixture which is calibrated quarterly and consists of Cd-109, Co-57, Ce-139, Hg-203, Sn-113, Cs-137, Y-88, and Co-60. ***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." ****Calibration Methods:** 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)



**Corporate Office**
24937 Avenue Tibbitts Valencia, California 91355

**Laboratory**
1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

# SECTION VI

# QUALITY CONTROL SAMPLE RESULTS SUMMARY

| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | UUISO Apex | 1 | pCi | g | Weston Solutions, Inc. |

## Laboratory Control Sample

| Analyte | | LCS Measured | CSU Measured | LCS Expected | Uncert. Expected | Known | Known Error | Result | CSU | Standard ID | Standard ACT (dpm) | Standard Error | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-234 | | 87.04% | 15.41% | 100.00% | 3.60% | 7.34E+00 | 2.64E-01 | 6.39E+00 | 9.85E-01 | U-8a | 3.20E+01 | 3.60E+00 | 5.09E-01 |
| U-238 | | 88.42% | 15.43% | 100.00% | 3.60% | 7.11E+00 | 2.56E-01 | 6.29E+00 | 9.71E-01 | U-8a | 3.10E+01 | 3.60E+00 | 5.09E-01 |
| | | | | | | | | | | | | | |

## Matrix Spike

| Analyte | Normalized Difference | MS Actual % Rec | Expected MS Result | Expected MS Uncert | Actual MS Result | Actual MS CSU | Sample Result | Sample CSU | Sample Aliquot | Standard ID | Standard ACT (dpm) | Standard Error % | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-234 | 2.26 | 81.88% | 7.31E+00 | 2.63E-01 | 6.56E+00 | 1.12E+00 | 5.79E-01 | 2.02E-01 | 1.01E+00 | U-8a | 3.20E+01 | 3.60 | 5.09E-01 |
| U-238 | 0.31 | 97.25% | 7.08E+00 | 2.55E-01 | 7.18E+00 | 1.20E+00 | 2.96E-01 | 1.41E-01 | 1.01E+00 | U-8a | 3.10E+01 | 3.60 | 5.09E-01 |
| | | | | | | | | | | | | | |

## Duplicate Results / QC Summary

| Analyte | Normalized Difference | RPD | Original Result | Original CSU | Duplicate Result | Duplicate CSU | LCS Relative Bias | LCS % R | | MS % R | MS ND | Rep RPD | Rep ND |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-234 | 0.27 | 5.94 | 5.78E-01 | 1.92E-01 | 6.13E-01 | 1.75E-01 | 0.87 | OK | | | | OK | OK |
| U-238 | 0.20 | 5.39 | 3.72E-01 | 1.48E-01 | 3.53E-01 | 1.26E-01 | 0.88 | OK | | | | OK | OK |
| U-235 | 1.62 | 283.35 | 4.97E-02 | 6.53E-02 | -8.58E-03 | 2.61E-02 | | OK | | | | NA | OK |

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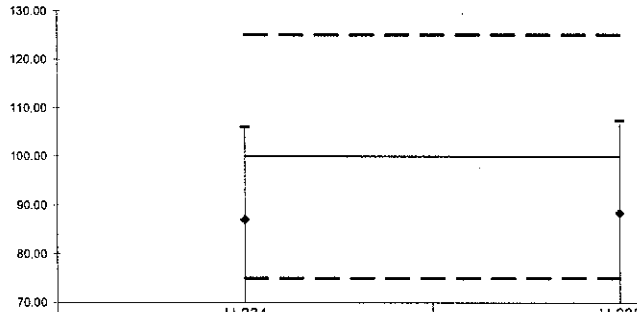
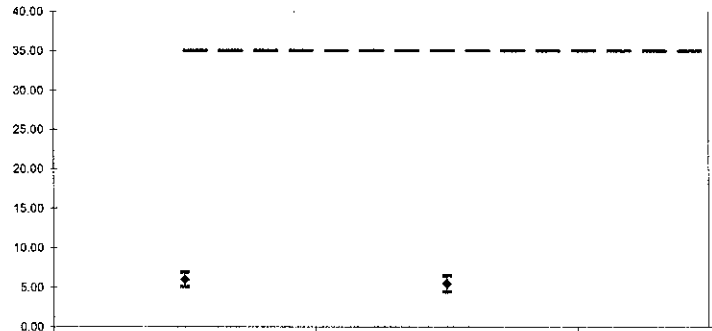
| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | UUISO Apex | 1 | pCi | g | Weston Solutions, Inc. |

## LCS % Recovery



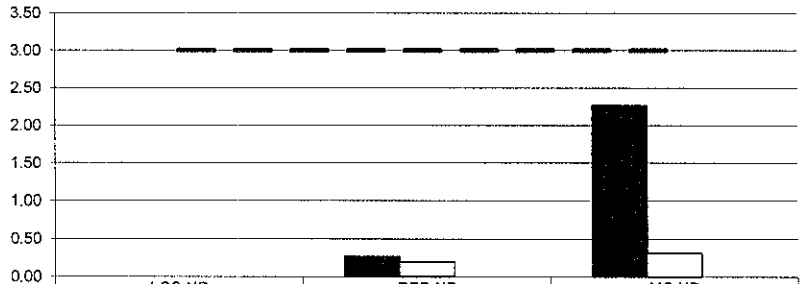

| | U-234 | U-238 |
|---|---|---|
| Lower Error | 68.03 | 69.38 |
| Upper Error | 106.04 | 107.45 |
| %R | 87.04 | 88.42 |
| LCL | 75 | 75 |
| Mean | 100 | 100 |
| UCL | 125 | 125 |

## Replicate Sample RPD



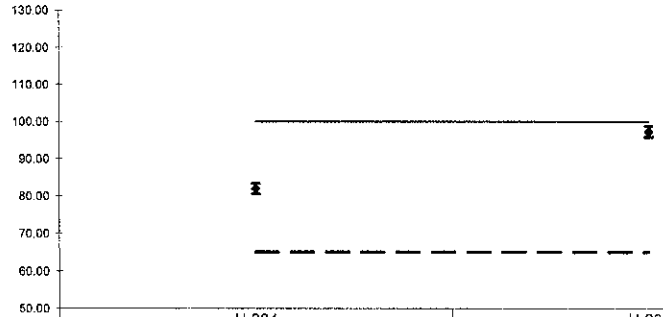

| | U-234 | U-238 | U-235 |
|---|---|---|---|
| Lower Error | 6.85 | 6.41 | 598.20 |
| Upper Error | 5.02 | 4.38 | -31.50 |
| RPD | 5.94 | 5.39 | 283.35 |
| CL | 35 | 35 | 35 |

## Normalized Difference




| | LCS ND | REP ND | MS ND |
|---|---|---|---|
| U-234 | 0.00 | 0.27 | 2.26 |
| U-238 | 0.00 | 0.20 | 0.31 |
| | 0.00 | 0.00 | 0.00 |
| UCL | 3 | 3 | 3 |

## Matrix Spike % Recovery




| | U-234 | U-238 |
|---|---|---|
| Lower Error | 80.50 | 95.79 |
| Upper Error | 83.25 | 98.71 |
| %R | 81.88 | 97.25 |
| LCL | 65 | 65 |
| Mean | 100 | 100 |
| UCL | 135 | 135 |

| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | UUISO Apex | 1 | pCi | g | Weston Solutions, Inc. |

## Laboratory Control Sample

| Analyte | | LCS Measured | CSU Measured | LCS Expected | Uncert. Expected | Known | Known Error | Result | CSU | Standard ID | Standard ACT (dpm) | Standard Error | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-234 | | 87.04% | 15.41% | 100.00% | 3.60% | 7.34E+00 | 2.64E-01 | 6.39E+00 | 9.85E-01 | U-8a | 3.20E+01 | 3.60E+00 | 5.09E-01 |
| U-238 | | 88.42% | 15.43% | 100.00% | 3.60% | 7.11E+00 | 2.56E-01 | 6.29E+00 | 9.71E-01 | U-8a | 3.10E+01 | 3.60E+00 | 5.09E-01 |
| | | | | | | | | | | | | | |

## Matrix Spike Duplicate

| Analyte | Normalized Difference | MS Actual % Rec | Expected MS Result | Expected MS Uncert | Actual MS Result | Actual MS CSU | Sample Result | Sample CSU | Sample Aliquot | Standard ID | Standard ACT (dpm) | Standard Error % | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-234 | 1.72 | 86.28% | 7.30E+00 | 2.63E-01 | 6.88E+00 | 1.11E+00 | 5.79E-01 | 2.02E-01 | 1.01E+00 | U-8a | 3.20E+01 | 3.60 | 5.10E-01 |
| U-238 | 2.62 | 76.88% | 7.07E+00 | 2.55E-01 | 6.49E+00 | 1.20E+00 | 1.05E+00 | 1.41E-01 | 1.01E+00 | U-8a | 3.10E+01 | 3.60 | 5.10E-01 |
| | | | | | | | | | | | | | |

## Duplicate Results / QC Summary

| Analyte | Normalized Difference | RPD | Original Result | Original CSU | Duplicate Result | Duplicate CSU | LCS Relative Bias | LCS % R | | MS % R | MS ND | Rep RPD | Rep ND |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U-234 | 0.27 | 5.94 | 5.78E-01 | 1.92E-01 | 6.13E-01 | 1.75E-01 | 0.87 | OK | | | | OK | OK |
| U-238 | 0.20 | 5.39 | 3.72E-01 | 1.48E-01 | 3.53E-01 | 1.26E-01 | 0.88 | OK | | | | OK | OK |
| U-235 | 1.62 | 283.35 | 4.97E-02 | 6.53E-02 | -8.58E-03 | 2.61E-02 | | OK | | | | NA | OK |

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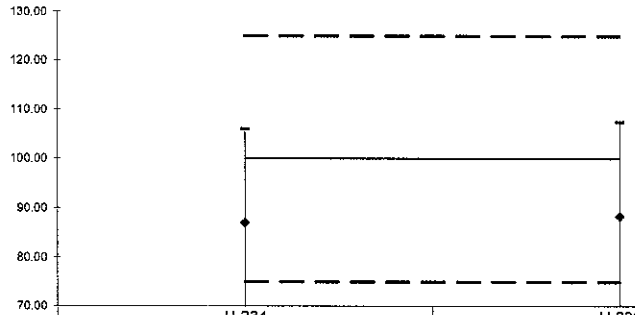
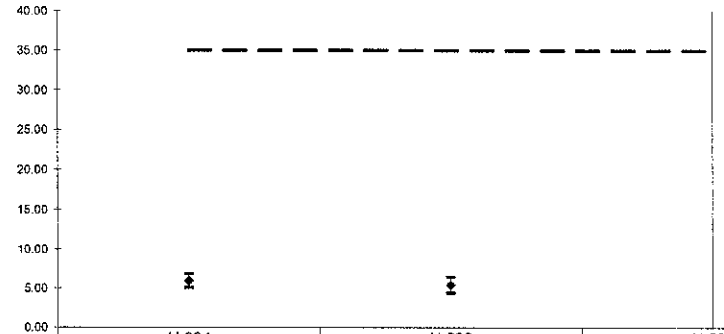
| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | UUISO Apex | 1 | pCi | g | Weston Solutions, Inc. |

## LCS % Recovery



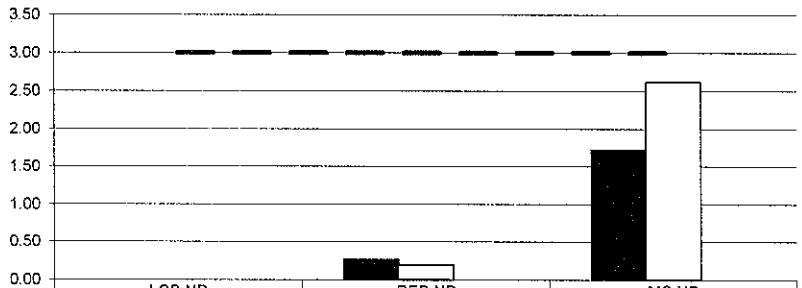

| | U-234 | U-238 |
|---|---|---|
| Lower Error | 68.03 | 69.38 |
| Upper Error | 106.04 | 107.45 |
| %R | 87.04 | 88.42 |
| LCL | 75 | 75 |
| Mean | 100 | 100 |
| UCL | 125 | 125 |

## Replicate Sample RPD



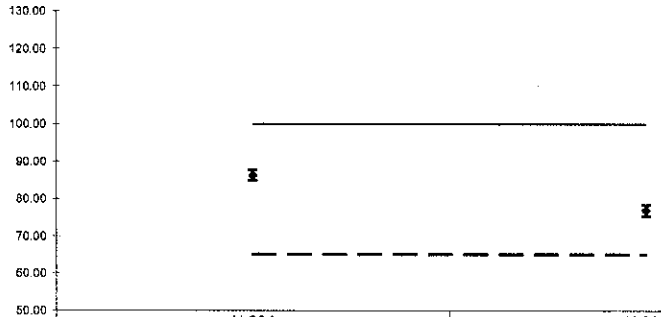

| | U-234 | U-238 | U-235 |
|---|---|---|---|
| Lower Error | 6.85 | 6.41 | 598.20 |
| Upper Error | 5.02 | 4.38 | -31.50 |
| RPD | 5.94 | 5.39 | 283.35 |
| CL | 35 | 35 | 35 |

## Normalized Difference




| | LCS ND | REP ND | MS ND |
|---|---|---|---|
| U-234 | 0.00 | 0.27 | 1.72 |
| U-238 | 0.00 | 0.20 | 2.62 |
| | 0.00 | 0.00 | 0.00 |
| UCL | 3 | 3 | 3 |

## Matrix Spike % Recovery




| | U-234 | U-238 |
|---|---|---|
| Lower Error | 84.91 | 75.42 |
| Upper Error | 87.65 | 78.33 |
| %R | 86.28 | 76.88 |
| LCL | 65 | 65 |
| Mean | 100 | 100 |
| UCL | 135 | 135 |

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| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | ThISO Apex | 1 | pCi | g | Weston Solutions, Inc. |

## Laboratory Control Sample

| Analyte | | LCS Measured | CSU Measured | LCS Expected | Uncert. Expected | Known | Known Error | Result | CSU | Standard ID | Standard ACT (dpm) | Standard Error | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH-228 | | 121.38% | 18.31% | 100.00% | 3.60% | 4.82E+00 | 1.74E-01 | 5.85E+00 | 1.07E+00 | Th-8b | 1.04E+02 | 3.60E+00 | 1.03E-01 |
| TH-230 | | 115.82% | 19.83% | 100.00% | 2.70% | 5.39E+00 | 1.46E-01 | 6.25E+00 | 1.24E+00 | Th-1b | 2.35E+01 | 2.70E+00 | 5.09E-01 |
| TH-232 | | 120.01% | 18.02% | 100.00% | 3.60% | 4.82E+00 | 1.74E-01 | 5.79E+00 | 1.04E+00 | Th-8b | 1.04E+02 | 3.60E+00 | 1.03E-01 |

## Matrix Spike

| Analyte | Normalized Difference | MS Actual % Rec | Expected MS Result | Expected MS Uncert | Actual MS Result | Actual MS CSU | Sample Result | Sample CSU | Sample Aliquot | Standard ID | Standard ACT (dpm) | Standard Error % | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH-228 | 2.73 | 143.61% | 4.55E+00 | 1.64E-01 | 7.12E+00 | 1.40E+00 | 5.81E-01 | 2.31E-01 | 1.06E+00 | Th-8b | 1.04E+02 | 3.60 | 1.03E-01 |
| TH-230 | 0.11 | 101.36% | 5.09E+00 | 1.37E-01 | 5.71E+00 | 1.23E+00 | 5.56E-01 | 2.19E-01 | 1.06E+00 | Th-1b | 2.35E+01 | 2.70 | 5.09E-01 |
| TH-232 | 1.59 | 121.37% | 4.55E+00 | 1.64E-01 | 6.01E+00 | 1.18E+00 | 4.87E-01 | 1.98E-01 | 1.06E+00 | Th-8b | 1.04E+02 | 3.60 | 1.03E-01 |

## Duplicate Results / QC Summary

| Analyte | Normalized Difference | RPD | Original Result | Original CSU | Duplicate Result | Duplicate CSU | LCS Relative Bias | LCS % R | | MS % R | MS ND | Rep RPD | Rep ND |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH-228 | 0.96 | 30.60 | 3.81E-01 | 1.78E-01 | 5.19E-01 | 2.17E-01 | 1.21 | OK | | | | INV | OK |
| TH-230 | 0.32 | 9.87 | 4.31E-01 | 1.85E-01 | 4.76E-01 | 2.01E-01 | 1.16 | OK | | | | OK | OK |
| TH-232 | 1.07 | 35.20 | 4.33E-01 | 1.81E-01 | 3.03E-01 | 1.54E-01 | 1.20 | OK | | | | INV | OK |

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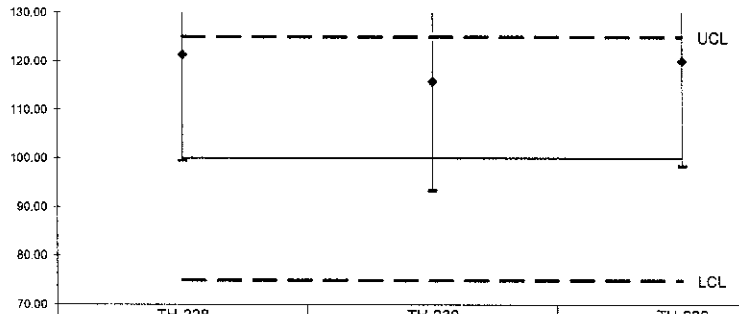
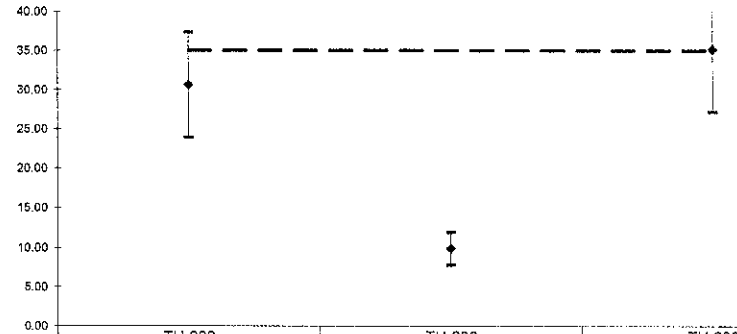
| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | ThISO Apex | 1 | pCi | g | Weston Solutions, Inc. |

## LCS % Recovery



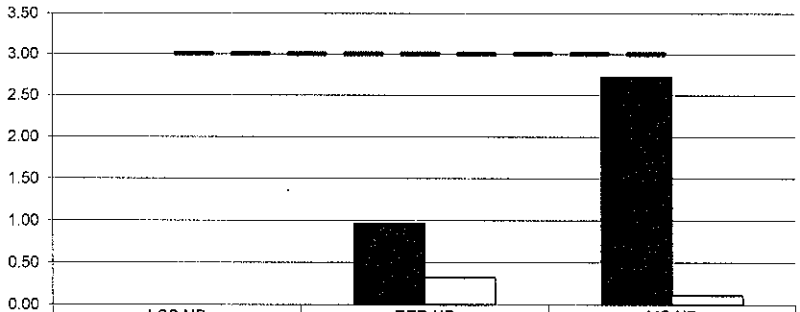

| | TH-228 | TH-230 | TH-232 |
|---|---|---|---|
| Lower Error | 99.48 | 93.29 | 98.38 |
| Upper Error | 143.29 | 138.36 | 141.63 |
| %R | 121.38 | 115.82 | 120.01 |
| LCL | 75 | 75 | 75 |
| Mean | 100 | 100 | 100 |
| UCL | 125 | 125 | 125 |

## Replicate Sample RPD



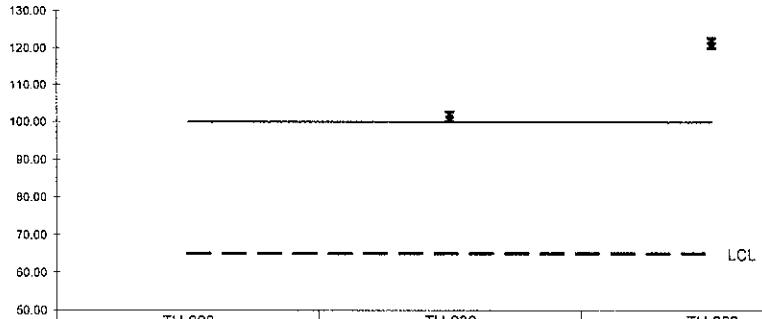

| | TH-228 | TH-230 | TH-232 |
|---|---|---|---|
| Lower Error | 37.31 | 11.97 | 43.21 |
| Upper Error | 23.89 | 7.77 | 27.19 |
| RPD | 30.60 | 9.87 | 35.20 |
| CL | 35 | 35 | 35 |

## Normalized Difference




| | LCS ND | REP ND | MS ND |
|---|---|---|---|
| TH-228 | 0.00 | 0.96 | 2.73 |
| TH-230 | 0.00 | 0.32 | 0.11 |
| UCL | 3 | 3 | 3 |

## Matrix Spike % Recovery




| | TH-228 | TH-230 | TH-232 |
|---|---|---|---|
| Lower Error | 142.04 | 100.00 | 120.03 |
| Upper Error | 145.17 | 102.73 | 122.71 |
| %R | 143.61 | 101.36 | 121.37 |
| LCL | 65 | 65 | 65 |
| Mean | 100 | 100 | 100 |
| UCL | 135 | 135 | 135 |

| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | ThISO Apex | 1 | pCi | g | Weston Solutions, Inc. |

## Laboratory Control Sample

| Analyte | | LCS Measured | CSU Measured | LCS Expected | Uncert. Expected | Known | Known Error | Result | CSU | Standard ID | Standard ACT (dpm) | Standard Error | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH-228 | | 121.38% | 18.31% | 100.00% | 3.60% | 4.82E+00 | 1.74E-01 | 5.85E+00 | 1.07E+00 | Th-8b | 1.04E+02 | 3.60E+00 | 1.03E-01 |
| TH-230 | | 115.82% | 19.83% | 100.00% | 2.70% | 5.39E+00 | 1.46E-01 | 6.25E+00 | 1.24E+00 | Th-1b | 2.35E+01 | 2.70E+00 | 5.09E-01 |
| TH-232 | | 120.01% | 18.02% | 100.00% | 3.60% | 4.82E+00 | 1.74E-01 | 5.79E+00 | 1.04E+00 | Th-8b | 1.04E+02 | 3.60E+00 | 1.03E-01 |

## Matrix Spike Duplicate

| Analyte | Normalized Difference | MS Actual % Rec | Expected MS Result | Expected MS Uncert | Actual MS Result | Actual MS CSU | Sample Result | Sample CSU | Sample Aliquot | Standard ID | Standard ACT (dpm) | Standard Error % | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH-228 | 1.16 | 115.60% | 6.42E+00 | 2.31E-01 | 8.01E+00 | 1.67E+00 | 5.81E-01 | 2.31E-01 | 1.09E+00 | Th-8b | 1.04E+02 | 3.60 | 1.50E-01 |
| TH-230 | 0.82 | 111.79% | 4.95E+00 | 1.34E-01 | 6.09E+00 | 1.38E+00 | 5.56E-01 | 2.19E-01 | 1.09E+00 | Th-1b | 2.35E+01 | 2.70 | 5.09E-01 |
| TH-232 | 0.19 | 97.84% | 6.42E+00 | 2.31E-01 | 6.77E+00 | 1.41E+00 | 4.87E-01 | 1.98E-01 | 1.09E+00 | Th-8b | 1.04E+02 | 3.60 | 1.50E-01 |

## Duplicate Results / QC Summary

| Analyte | Normalized Difference | RPD | Original Result | Original CSU | Duplicate Result | Duplicate CSU | LCS Relative Bias | LCS % R | | MS % R | MS ND | Rep RPD | Rep ND |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH-228 | 0.96 | 30.60 | 3.81E-01 | 1.78E-01 | 5.19E-01 | 2.17E-01 | 1.21 | OK | | | | INV | OK |
| TH-230 | 0.32 | 9.87 | 4.31E-01 | 1.85E-01 | 4.76E-01 | 2.01E-01 | 1.16 | OK | | | | OK | OK |
| TH-232 | 1.07 | 35.20 | 4.33E-01 | 1.81E-01 | 3.03E-01 | 1.54E-01 | 1.20 | OK | | | | INV | OK |

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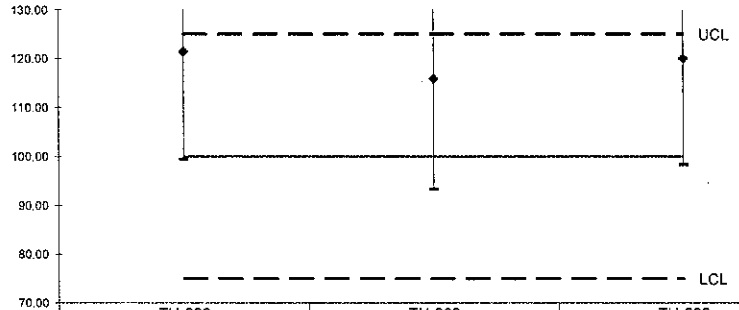
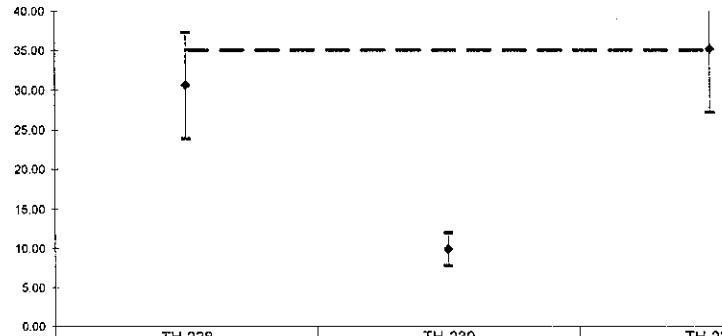
| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | ThISO Apex | 1 | pCi | g | Weston Solutions, Inc. |

## LCS % Recovery



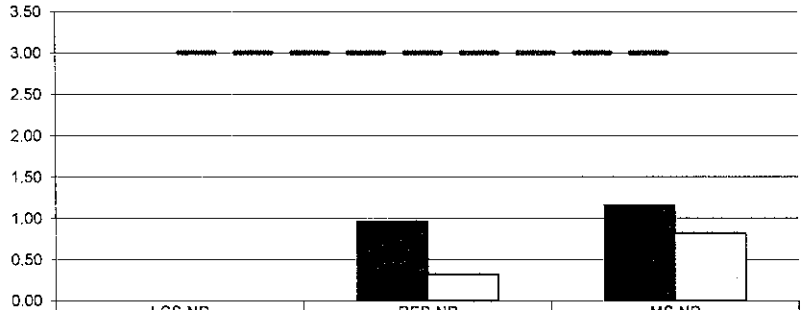

| | TH-228 | TH-230 | TH-232 |
|---|---|---|---|
| Lower Error | 99.48 | 93.29 | 98.38 |
| Upper Error | 143.29 | 138.36 | 141.63 |
| %R | 121.38 | 115.82 | 120.01 |
| LCL | 75 | 75 | 75 |
| Mean | 100 | 100 | 100 |
| UCL | 125 | 125 | 125 |

## Replicate Sample RPD



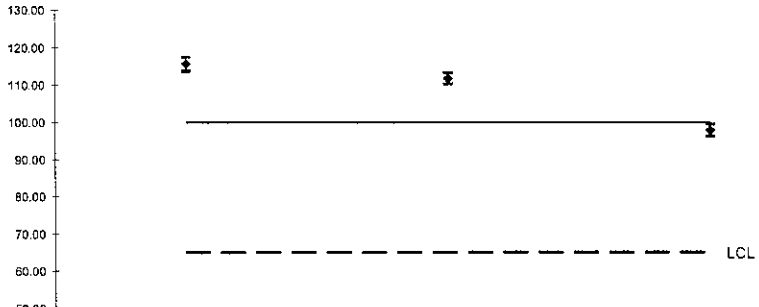

| | TH-228 | TH-230 | TH-232 |
|---|---|---|---|
| Lower Error | 37.31 | 11.97 | 43.21 |
| Upper Error | 23.89 | 7.77 | 27.19 |
| RPD | 30.60 | 9.87 | 35.20 |
| CL | 35 | 35 | 35 |

## Normalized Difference




| | LCS ND | REP ND | MS ND |
|---|---|---|---|
| TH-228 | 0.00 | 0.96 | 1.16 |
| TH-230 | 0.00 | 0.32 | 0.82 |
| UCL | 3 | 3 | 3 |

## Matrix Spike % Recovery




| | TH-228 | TH-230 | TH-232 |
|---|---|---|---|
| Lower Error | 113.69 | 110.27 | 96.20 |
| Upper Error | 117.50 | 113.30 | 99.48 |
| %R | 115.60 | 111.79 | 97.84 |
| LCL | 65 | 65 | 65 |
| Mean | 100 | 100 | 100 |
| UCL | 135 | 135 | 135 |

0058

| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | Gamma | 2 | pCi | g | Weston Solutions, Inc. |

## Laboratory Control Sample

| Analyte | | LCS Measured | CSU Measured | LCS Expected | Uncert. Expected | Known | Known Error | Result | CSU | Standard ID | Standard ACT (dpm) | Standard Error | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CO-60 | | 91.62% | 7.93% | 100.00% | 3.89% | 1.35E+02 | 5.27E+00 | 1.24E+02 | 9.83E+00 | GAS-1402 | 1.35E+02 | 5.27E+00 | 7.36E+02 |
| CS-137 | | 95.41% | 13.27% | 100.00% | 4.01% | 8.44E+01 | 3.38E+00 | 8.05E+01 | 1.07E+01 | GAS-1402 | 8.44E+01 | 3.38E+00 | 7.36E+02 |
| | | | | | | | | | | | | | |

## Matrix Spike

| Analyte | Normalized Difference | MS Actual % Rec | Expected MS Result | Expected MS Uncert | Actual MS Result | Actual MS CSU | Sample Result | Sample CSU | Sample Aliquot | Standard ID | Standard ACT (dpm) | Standard Error % | Standard Added (g) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

## Replicate Sample

| Analyte | Normalized Difference | RPD | Original Result | Original CSU | Replicate Result | Replicate CSU |
|---|---|---|---|---|---|---|
| AC-228 | 1.13 | 16.52 | 1.07E+00 | 2.19E-01 | 9.08E-01 | 1.79E-01 |
| K-40 | 2.72 | 24.69 | 2.16E+01 | 2.69E+00 | 1.69E+01 | 2.12E+00 |
| RA-226 | 0.89 | 9.73 | 9.51E-01 | 1.38E-01 | 8.63E-01 | 1.38E-01 |

## QC Summary

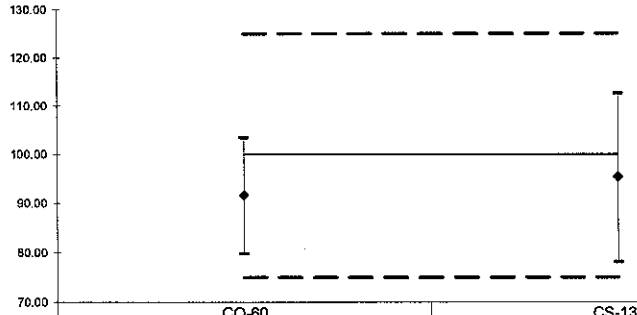
| LCS Relative Bias | LCS % R | | MS % R | MS ND | Rep RPD | Rep ND |
|---|---|---|---|---|---|---|
| 0.92 | OK | | <CS-137 | AC-228> | OK | |
| 0.95 | OK | | <CO-60 | K-40> | OK | OK |
| | | | | RA-226> | OK | OK |

0059

Version

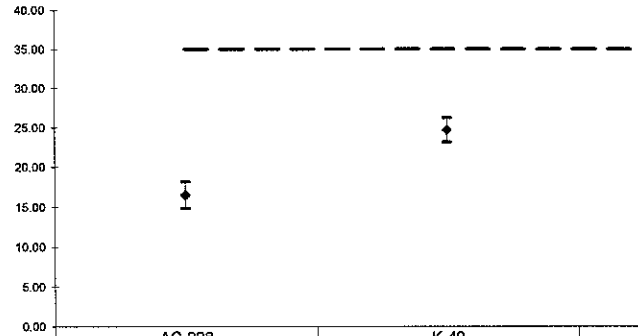
| WO | Analysis | Run | Activity Units | Aliquot Units | Client Name |
|---|---|---|---|---|---|
| 17-07087 | Gamma | 2 | pCi | g | Weston Solutions, Inc. |

## LCS % Recovery



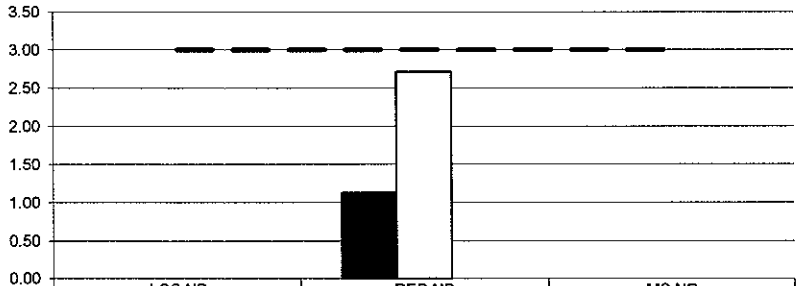

| | CO-60 | CS-137 |
|---|---|---|
| Lower Error | 79.79 | 78.14 |
| Upper Error | 103.44 | 112.69 |
| %R | 91.62 | 95.41 |
| LCL | 75 | 75 |
| Mean | 100 | 100 |
| UCL | 125 | 125 |

## Replicate Sample RPD




| | AC-228 | K-40 | RA-226 |
|---|---|---|---|
| Lower Error | 18.18 | 26.23 | 10.46 |
| Upper Error | 14.86 | 23.14 | 8.99 |
| RPD | 16.52 | 24.69 | 9.73 |
| CL | 35 | 35 | 35 |

## Normalized Difference




| | LCS ND | REP ND | MS ND |
|---|---|---|---|
| CO-60 | 0.00 | 1.13 | 0.00 |
| CS-137 | 0.00 | 2.72 | 0.00 |
| | 0.00 | 0.00 | 0.00 |
| UCL | 3 | 3 | 3 |

## No Matrix Spike

0060

# SECTION VII

# LABORATORY TECHNICIAN'S NOTES
# &
# RUN LOGS

**ISO-U NOTES**

| EBERLINE SERVICES<br>Work Order Analysis Notes | Oak Ridge Laboratory<br>601 Scarboro Rd.<br>Oak Ridge, TN 37830<br>Voice: 865.481.0683<br>www.eberlineservices.com | Internal Work Order | 17-07087 |
|---|---|---|---|
| | | Analysis Code | UUISO |
| | | Run Number | 1 |

| # | Date | Dept | User | Notes |
|---|---|---|---|---|
| 1 | 08/14/17 06:11 | PREP | JHARVEY | ALIQUOTED AND ADDED SPIKES AND TRACERS- ADDED HF AND DRIED SAMPLES DOWN- ADDED MIXED ACIDS AND TOOK SAMPLES TO DRYNESS- SUBMITTED SAMPLES TO SEPARATIONS |

J Harvey
8/14/17

| EBERLINE SERVICES<br>**Work Order Analysis Notes** | **Oak Ridge Laboratory**<br>**601 Scarboro Rd.**<br>**Oak Ridge, TN 37830**<br>**Voice: 865.481.0683**<br>**www.eberlineservices.com** | Internal Work Order | 17-07087 |
|---|---|---|---|
| | | Analysis Code | UUISO |
| | | Run Number | 1 |

| # | Date | Dept | User | Notes |
|---|---|---|---|---|
| 1 | 08/14/17 06:11 | PREP | JHARVEY | ALIQUOTED AND ADDED SPIKES AND TRACERS- ADDED HF AND DRIED SAMPLES DOWN- ADDED MIXED ACIDS AND TOOK SAMPLES TO DRYNESS- SUBMITTED SAMPLES TO SEPARATIONS |
| 2 | 08/21/17 17:14 | CHEM | JDEMELAS | Added concentrated HCl to sample beakers and heated to dryness; Added 20 ml 8N HCL to samples and transferred to new, labeled C-Tubes, rinsing with 8N HCl to bring volume to ~35 ml; Preconditioned resin columns with 35 ml 8N HCl; Centrifuged samples and loaded onto columns; Rinsed C-Tubes with 20 ml 8N HCl, centrifuged as needed and loaded onto columns; Rinsed columns with 35 ml 8N HCl – 0.1N NH4I, 35 ml of 6.5N HCl – 0.04N HF, and 10 ml of 6.5N HCl; Eluted Uranium with 50 ml of 0.5N HCl into clean, labeled 100-ml beakers; Dried-down samples on hotplate; Dissolved samples in ~10 ml of concentrated HCl; Transferred to new, labeled C-Tubes with DI H2O. Set samples aside for later precipitation and filtering. |

8/21/17

| EBERLINE SERVICES<br>**Work Order Analysis Notes** | **Oak Ridge Laboratory**<br>**601 Scarboro Rd.**<br>**Oak Ridge, TN 37830**<br>**Voice: 865.481.0683**<br>**www.eberlineservices.com** | Internal Work Order | 17-07087 |
|---|---|---|---|
| | | Analysis Code | UUISO |
| | | Run Number | 1 |

| # | Date | Dept | User | Notes |
|---|---|---|---|---|
| 1 | 08/14/17 06:11 | PREP | JHARVEY | ALIQUOTED AND ADDED SPIKES AND TRACERS- ADDED HF AND DRIED SAMPLES DOWN- ADDED MIXED ACIDS AND TOOK SAMPLES TO DRYNESS- SUBMITTED SAMPLES TO SEPARATIONS |
| 2 | 08/21/17 17:14 | CHEM | JDEMELAS | Added concentrated HCl to sample beakers and heated to dryness; Added 20 ml 8N HCL to samples and transferred to new, labeled C-Tubes, rinsing with 8N HCl to bring volume to ~35 ml; Preconditioned resin columns with 35 ml 8N HCl; Centrifuged samples and loaded onto columns; Rinsed C-Tubes with 20 ml 8N HCl, centrifuged as needed and loaded onto columns; Rinsed columns with 35 ml 8N HCl – 0.1N NH4I, 35 ml of 6.5N HCl – 0.04N HF, and 10 ml of 6.5N HCl; Eluted Uranium with 50 ml of 0.5N HCl into clean, labeled 100-ml beakers; Dried-down samples on hotplate; Dissolved samples in ~10 ml of concentrated HCl; Transferred to new, labeled C-Tubes with DI H2O. Set samples aside for later precipitation and filtering. |
| 3 | 08/22/17 05:29 | CHEM | TSMITH | Followed steps 12.1.7 to 12.4.5 in AP-005 . ( Precipitated and filtered samples for Uranium ) |

8/22/17
JM

EBERLINE SERVICES

# Reagents Used in an Analysis

| Internal Work Order | |
|---|---|
| 17-07087 | |
| Analysis Code | Run |
| UUISO | 1 |

| Reagent ID | Reagent Name | Reagent Concentration | Analyst ID | Date Recorded |
|---|---|---|---|---|
| 019093P | Hydrofluoric Acid | Reagent Grade | JHARVEY | 8/14/2017 |
| 018971P | Nitric Acid | Reagent Grade | JHARVEY | 8/14/2017 |
| 019133P | Perchloric Acid | Reagent Grade | JHARVEY | 8/14/2017 |
| 018550P | Sulfuric Acid | Reagent Grade | JHARVEY | 8/14/2017 |
| 017344P | Anion Exchange Resin | Reagent Grade | JDEMELAS | 8/21/2017 |
| 019185S | HCl - HF | 6.5N - 0.04N | JDEMELAS | 8/21/2017 |
| 019198S | HCl - NH4I | 8N - 0.1M | JDEMELAS | 8/21/2017 |
| 019134D01 | Hydrochloric Acid | 0.5N | JDEMELAS | 8/21/2017 |
| 019168S | Hydrochloric Acid | 6.5N | JDEMELAS | 8/21/2017 |
| 019192S | Hydrochloric Acid | 8N | JDEMELAS | 8/21/2017 |
| 019190S | HCl - HF | 6.5N - 0.04N | JDEMELAS | 8/21/2017 |
| 019183P | Hydrochloric Acid | Reagent Grade | JDEMELAS | 8/21/2017 |
| 019187S | Carbon substrate | Solution | TSMITH | 8/22/2017 |
| 019063P | Ethyl Alcohol | 1 | TSMITH | 8/22/2017 |
| 019093P | Hydrofluoric Acid | Reagent Grade | TSMITH | 8/22/2017 |
| 018890S | Neodymium Carrier | 1 mg/ml | TSMITH | 8/22/2017 |
| 019038P | Titanous Chloride | Reagent Grade | TSMITH | 8/22/2017 |

Alpha #3



| Date | Sample # | Client | Load Time | CT Time | Analyst | Tech |
|---|---|---|---|---|---|---|
| 8/19/17 | Daily Pulsers | Lab | 0943 | 10 mins | NA | KB |
| 8/19/17 | 1707085A(14-20) | Weston | 1000 | 2h50 | UU | KB |
| 8/19/17 | 1707086A(1-17) | Weston | 1002 | 2h50 | UU | KB |
| 8/19/17 | 1707086A(18-20) | Weston | 1302 | 2h50 | UU | KB |
| 8/21 | Daily Pulser | LAB | 0521 | 〃 | NA | — |
| 8/21 | 1708040A(3-6) | ESLLC | 0830 | 2h5 | PuIso | C |
| 8/21 | 1708077A(1-5) | Smoky Mount | 0830 | 2h5 | PuIso | C |
| 8/21 | 1708077A(1-4) | Smoky Mount | 0832 | 2h5 | Pu242 | C |
| 8/21 | 1708077A(1-4) | Smoky Mount | 0832 | 2h5 | UUIso | C |
| 8/21 | 1708070A(1-4) | UCon | 0834 | 2h5 | UUIso | C |
| 8/21 | 1707161A(1-3) | USA | 0835 | 2h5 | UUIso | C |
| 8/21/17 | 1708081A(2-4) | USA | 1131 | 2h50 | Rab | KB |
| 8/21/17 | 1707086A(1-20) | Weston | 1133 | 2h50 | Th | KB |
| 8/21/17 | 1707093A(1) | Weston | 1134 | 2h50 | UU | KB |
| 8/21/17 | 1707093A(2-10) | Weston | 1443 | 2h50 | UU | KB |
| 8/21/17 | 1708082A(1-6) | USA | 1444 | 2h50 | Rab | KB |
| 8/22 | Daily Pulser | LAB | 0512 | 〃 | NA | C |
| 8/22 | 1708082A(1-6) | USA | 0914 | 2h5 | ThIso | C |
| 8/22 | 1707087A(1-13) | Weston | 0914 | 2h5 | UUIso | — |
| 8/22 | 1708040A(1-5) | Zion | 0915 | 2h5 | NP237 | — |
| 8/22/17 | 1708040A(1-5) | ESLLC | 1215 | 2h50 | Am243 | KB |
| 8/22/17 | 1707093A(1-10) | Weston | 1216 | 2h50 | Th | KB |
| 8/22/17 | 1707087A(14-20) | Weston | 1217 | 2h50 | UU | KB |

**ISO-TH NOTES**

| EBERLINE SERVICES<br>Work Order Analysis Notes | Oak Ridge Laboratory<br>601 Scarboro Rd.<br>Oak Ridge, TN 37830<br>Voice: 865.481.0683<br>www.eberlineservices.com | Internal Work Order | 17-07087 |
|---|---|---|---|
| | | Analysis Code | ThISO |
| | | Run Number | 1 |

| # | Date | Dept | User | Notes |
|---|---|---|---|---|
| 1 | 08/14/17 06:11 | PREP | JHARVEY | ALIQUOTED AND ADDED SPIKES AND TRACERS- ADDED HF AND DRIED SAMPLES DOWN- ADDED MIXED ACIDS AND TOOK SAMPLES TO DRYNESS- SUBMITTED SAMPLES TO SEPARATIONS |

JHarvey
8/14/17

| EBERLINE SERVICES<br>**Work Order Analysis Notes** | **Oak Ridge Laboratory**<br>**601 Scarboro Rd.**<br>**Oak Ridge, TN 37830**<br>**Voice: 865.481.0683**<br>**www.eberlineservices.com** | Internal Work Order | 17-07087 |
|---|---|---|---|
| | | Analysis Code | ThISO |
| | | Run Number | 1 |

| # | Date | Dept | User | Notes |
|---|---|---|---|---|
| 1 | 08/14/17 06:11 | PREP | JHARVEY | ALIQUOTED AND ADDED SPIKES AND TRACERS- ADDED HF AND DRIED SAMPLES DOWN- ADDED MIXED ACIDS AND TOOK SAMPLES TO DRYNESS- SUBMITTED SAMPLES TO SEPARATIONS |
| 2 | 08/22/17 18:30 | CHEM | JDEMELAS | Added concentrated HNO3 to sample beakers and heated to dryness; Added 20 ml 8N HNO3 to samples and transferred to new, labeled C-Tubes, adding 8N HNO3 to bring volume to ~35 ml; Preconditioned resin columns with 50 ml 8N HNO3; Centrifuged samples as needed, and passed through columns; Rinsed C-Tubes with 20 ml 8N HNO3; Centrifuged rinsates and loaded onto columns; Rinsed columns with 40 ml 8N HNO3; Eluted Thorium with 50 ml of 8N HCl into clean, labeled 100-ml beakers; Dried-down samples on hotplate; Dissolved samples in ~10 ml of concentrated HCl; Transferred to new, labeled C-Tubes with deiononized water, bringing volume to ~15ml. Set samples aside for later precipitation and filtering. |

8/22/17

EBERLINE SERVICES

**Work Order Analysis Notes**

**Oak Ridge Laboratory**
**601 Scarboro Rd.**
**Oak Ridge, TN 37830**
**Voice: 865.481.0683**
**www.eberlineservices.com**

| | |
|---|---|
| Internal Work Order | 17-07087 |
| Analysis Code | ThISO |
| Run Number | 1 |

| # | Date | Dept | User | Notes |
|---|---|---|---|---|
| 1 | 08/14/17 06:11 | PREP | JHARVEY | ALIQUOTED AND ADDED SPIKES AND TRACERS- ADDED HF AND DRIED SAMPLES DOWN- ADDED MIXED ACIDS AND TOOK SAMPLES TO DRYNESS- SUBMITTED SAMPLES TO SEPARATIONS |
| 2 | 08/22/17 18:30 | CHEM | JDEMELAS | Added concentrated HNO3 to sample beakers and heated to dryness; Added 20 ml 8N HNO3 to samples and transferred to new, labeled C-Tubes, adding 8N HNO3 to bring volume to ~35 ml; Preconditioned resin columns with 50 ml 8N HNO3; Centrifuged samples as needed, and passed through columns; Rinsed C-Tubes with 20 ml 8N HNO3; Centrifuged rinsates and loaded onto columns; Rinsed columns with 40 ml 8N HNO3; Eluted Thorium with 50 ml of 8N HCl into clean, labeled 100-ml beakers; Dried-down samples on hotplate; Dissolved samples in ~10 ml of concentrated HCl; Transferred to new, labeled C-Tubes with deiononized water, bringing volume to ~15ml. Set samples aside for later precipitation and filtering. |
| 3 | 08/23/17 05:11 | CHEM | TSMITH | Followed steps 12.2.5 to 12.4.5 in AP-005 . ( Precipitated and filtered samples for Thorium ) |

8-23-17
JM

Eberline Analytical
Oak Ridge Laboratory



EBERLINE SERVICES

# Reagents Used in an Analysis

| Internal Work Order | |
|---|---|
| 17-07087 | |
| Analysis Code | Run |
| ThISO | 1 |

| Reagent ID | Reagent Name | Reagent Concentration | Analyst ID | Date Recorded |
|---|---|---|---|---|
| 019093P | Hydrofluoric Acid | Reagent Grade | JHARVEY | 8/14/2017 |
| 018971P | Nitric Acid | Reagent Grade | JHARVEY | 8/14/2017 |
| 019133P | Perchloric Acid | Reagent Grade | JHARVEY | 8/14/2017 |
| 018550P | Sulfuric Acid | Reagent Grade | JHARVEY | 8/14/2017 |
| 017344P | Anion Exchange Resin | Reagent Grade | JDEMELAS | 8/22/2017 |
| 019183P | Hydrochloric Acid | Reagent Grade | JDEMELAS | 8/22/2017 |
| 019203S | Hydrochloric Acid | 8N | JDEMELAS | 8/22/2017 |
| 019204S | Nitric Acid | 8N | JDEMELAS | 8/22/2017 |
| 019191S | Nitric Acid | 8N | JDEMELAS | 8/22/2017 |
| 019074P | Nitric Acid | Reagent Grade | JDEMELAS | 8/22/2017 |
| 019187S | Carbon substrate | Solution | TSMITH | 8/23/2017 |
| 019106S | Cerrium Carrier | 0.1mg/ml | TSMITH | 8/23/2017 |
| 019063P | Ethyl Alcohol | 1 | TSMITH | 8/23/2017 |
| 019093P | Hydrofluoric Acid | Reagent Grade | TSMITH | 8/23/2017 |

Alpha #3



| Date | Sample # | Client | Lab Time | Count Time | Analyte | Tech |
|---|---|---|---|---|---|---|
| 8/23/17 | 1708007A (2-4) | UWR | 1131 | 2hr 50- | UU | KB |
| 8/23/17 | 1708006A (1-4) | UWR | 1132 | 2hr 50- | Th | KB |
| 8/23/17 | 1708006A (1-4) | UWR | 1132 | 2hr 50- | Th229 | KB |
| 8/23/17 | 1708006A (1-4) | UWR | 1133 | 2hr 50- | Np | KB |
| 8/23/17 | 1708006A (1-4) | UWR | 1133 | 2hr 50- | Pu242 | KB |
| 8/23/17 | 1707087A (1-5) | Weston | 1134 | 2hr 50- | Th | KB |
| 8/23/17 | 1708101A (1-4) | USA | 1431 | 2hr 50- | Ra6 | KB |
| 8/23/17 | 1707087A (6-20) | Weston | 1433 | 2hr 50- | Th | KB |

**GAMMA NOTES**

GE 1



| DATE | Sample # | Client | Load Time | CT. Time | Analysis | Tech |
|---|---|---|---|---|---|---|
| 8/21/17 | 1707086-07 | Weston | 1524 | 1 hr | ✓ | KB |
| 8/21/17 | 1707086-10 | Weston | 1625 | 1 hr | ✓ | KB |
| 8/21/17 | 1707086-14 | Weston | 1726 | 1 hr | ✓ | KB |
| 8/21/17 | 1708086-03 | Indust. + Env. | 1827 | 4 hrs | ✓ | KB |
| 8/22 | GA716 | LAB | 0510 | 15 | ✓ | [illegible] |
| 8/22 | [illegible] | LAB | 0510 | 15 | ✓ | [illegible] |
| 8/22 | 1707086-16 | Weston | 0510 | 2h | ✓ | — |
| 8/22 | 1707086-20 | Weston | 0654 | 2h | ✓ | — |
| 8/22 | 1707086-07 | LAB | 0759 | 2h | ✓ | — |
| 8/22 | 1707087-03 | Weston | 0901 | 2h | ✓ | [illegible] |
| 8/22 | 1707087-04 | Weston | 1004 | 2h | ✓ | [illegible] |
| 8/22 | 1707087-12 | Weston | 1106 | 2h | ✓ | — |
| 8/24/17 | 1707087-16 | Weston | 1209 | 1 hr | ✓ | KB |
| 8/22/17 | 1707087-20 | Weston | 1311 | 2h | ✓ | — |

GE 2



| DATE | SAMPLE # | Client | Load Time | CT. Time | Analysis | Tech |
|---|---|---|---|---|---|---|
| ~~8/17~~ | ~~GAS 1 8/17~~ | ~~LAB~~ | | | | |
| ~~8/17~~ | ~~8/17~~ | ~~LAB~~ | | | | |
| 8/19/17 | System Bkgd | Lab | 1244 | 24 hrs | r | KB |
| 8/21 | GAS 1601 | LAB | 0516 | 15 | r | C |
| 8/21 | DailyR | LAB | 0546 | 15 | r | C |
| ~~8/21~~ | ~~1707126-12~~ | ~~Weston~~ | ~~0601~~ | ~~15~~ | ~~r~~ | ~~—~~ |
| 8/21 | GAS 1601 | LAB | 0836 | 15 | r | C |
| 8/21 | DailyR | LAB | 0853 | 15 | r | C |
| 8/21 | 1707085-06 | Weston | 0910 | 1h | r | — |
| 8/21 | 1708081-01 | USA | 1011 | 15 | Bw | — |
| 8/21 | 1708081-04 | USA | 1026 | 15 | Bw | — |
| 8/21 | 1708082-03 | USA | 1042 | 15 | Bw | C |
| 8/21 | 1708082-06 | USA | 1058 | 15 | Bw | — |
| 8/21 | ~~1709~~ 1707085-12 | Weston | 1114 | 1h | r | — |
| 8/21/17 | 1707085-16 | Weston | 1217 | 1h | r | KB |
| 8/21/17 | 1707085-18 | Weston | 1315 | 1h | r | KB |
| 8/21/17 | 1707086-03 | Weston | 1420 | 1h | r | KB |
| 8/21/17 | 1707086-04 | Weston | 1521 | 1h | r | KB |
| 8/21/17 | 1708091-03 | Smoky Mt. Solvts. | 1623 | 2hr | r | KB |
| 8/21/17 | 1708091-04 | Smoky Mt. Solvts. | 1823 | 2hr | r | KB |
| 8/22 | GAS 1601 | LAB | 0510 | 15 | r | C |
| 8/22 | DailyR | LAB | 0533 | 15 | r | C |
| 8/22 | 1707086-17 | Weston | 0550 | 1h | r | — |
| 8/22 | 1707161-03 | USA | 0655 | 1h | r | |
| 8/22 | 1707161-04 | USA | 0755 | 1h | r | C |
| 8/22 | 1707087-05 | Weston | 0901 | 1h | r | — |
| 8/22 | 1707087-04 | Weston | 1004 | 1h | r | — |
| 8/22 | 1707087-13 | Weston | 1106 | 1h | r | — |
| 8/22/17 | 1707087-17 | Weston | 1208 | 1hr | r | KB |

# GE 3



| Date | Sample # | Client | Lab Time | CT. Time | Analysis | Tech |
|---|---|---|---|---|---|---|
| 8/19/17 | System Blkgd | Lab | 1245 | 24 hrs | ✓ | KB |
| 8/21 | ~~GPS~~/1602 | LAB | 0516 | 15 | ✓ | [illegible] |
| 8/21 | Daily QC | LAB | 0546 | 15 | ✓ | |
| 8/21 | 1707126-13 | Weston | 0605 | 2h | ✓ | — |
| 8/21 | 1707126-15 | Weston | 0707 | 2h | ✓ | — |
| 8/21 | 1707126-18 | Weston | 0810 | 2h | ✓ | — |
| 8/21 | 1707085-07 | Weston | 0914 | 2h | ✓ | — |
| 8/21 | 1708081-02 | USA | 1013 | 15 | Bu | — |
| 8/21 | 1708082-01 | USA | 1028 | 15 | Bu | — |
| 8/21 | 1708082-04 | USA | 1044 | 15 | Bu | — |
| 8/21 | 1707085-08 | Weston | 1101 | 2h | ✓ | — |
| 8/21/17 | 1707085-14 | Weston | 1203 | 1h | ✓ | KB |
| 8/21/17 | 1707085-19 | Weston | 1223 | 1h | ✓ | KB |
| 8/21/17 | 1707086-06 | Weston | 1424 | 1h | ✓ | KB |
| 8/21/17 | 1707086-08 | Weston | 1524 | 1h | ✓ | KB |
| 8/21/17 | 1707086-13 | Weston | 1625 | 1h | ✓ | KB |
| 8/21/17 | 1707086-15 | Weston | 1726 | 1h | ✓ | KB |
| 8/21/17 | 1708086-02 | Indust. + Env. | 1827 | 4 hrs | ✓ | KB |
| 8/22 | ~~GPS~~/1602 | LAB | 0510 | 15 | ✓ | [illegible] |
| 8/22 | Daily QC | LAB | 0533 | 15 | ✓ | |
| 8/22 | 1707086-18 | Weston | 0550 | 2h | ✓ | — |
| 8/22 | 1707161-05 | USA | 0655 | 2h | ✓ | — |
| 8/22 | 1707161-02 | USA | 0759 | 2h | ✓ | — |
| 8/22 | 1707087-06 | Weston | 0901 | 2h | ✓ | — |
| 8/22 | 1707087-08 | Weston | 1004 | 2h | ✓ | — |
| 8/22 | 1707087-14 | Weston | 1106 | 2h | ✓ | — |
| 8/22/17 | 1707087-18 | Weston | 1208 | 1h | ✓ | KB |

GE 4



| DATE | Sample # | Client | Load Time | CTI Time | Analysis | Tech |
|---|---|---|---|---|---|---|
| 8/21 | GAW16 | LAB | 0516 | 15 | ✓ | C |
| 8/21 | Daily R | LAB | 0546 | 15 | ✓ | |
| 8/21 | 1707126-14 | Weston | 0605 | 1h | ✓ | — |
| 8/21 | 1707126-16 | Weston | 0707 | 1h | ✓ | — |
| 8/21 | 1707085-03 | Weston | 0810 | 1h | ✓ | — |
| 8/21 | 1707085-04 | Weston | 0911 | 1h | ✓ | — |
| 8/21 | 1708081-03 | USA | 1013 | 15 | Ba | — |
| 8/21 | 1708082-02 | USA | 1028 | 15 | Ba | — |
| 8/21 | 1708082-05 | USA | 1044 | 15 | Ba | — |
| 8/21 | 1707085-11 | Weston | 1101 | 1h | ✓ | C |
| 8/21/17 | 1707085-01 | Weston | 1203 | 30mins | ✓ | KB |
| 8/21/17 | 1707085-02 | Weston | 1235 | 1hr | ✓ | KB |
| 8/21/17 | 1707085-20 | Weston | 1346 | 1hr | ✓ | KB |
| 8/21/17 | 1707086-01 | Weston | 1448 | 30mins | ✓ | KB |
| 8/21/17 | 1707086-02 | Weston | 1520 | 1hr | ✓ | KB |
| 8/21/17 | 1707086-09 | Weston | 1621 | 1hr | ✓ | KB |
| ~~8/21/17~~ | ~~1707086-~~ | ~~Weston~~ | ~~KB 8/21/17~~ | ~~1hr~~ | ~~✓~~ | ~~KB~~ |
| 8/21/17 | 1708091-01 | Smoky Mt. Solutns. | 1722 | 30mins | ✓ | KB |
| 8/21/17 | 1708086-01 | Indust. + Env. | 1754 | 30mins | ✓ | KB |
| 8/21/17 | 1708091-02 | Smoky Mt. Solutns | 1826 | 4hrs | ✓ | KB |
| 8/22 | GAW16 | LAB | 0510 | 15 | ✓ | C |
| 8/22 | Daily R | LAB | 0537 | 15 | ✓ | — |
| 8/22 | GAW16 | LAB | 0550 | 15 | ✓ | ✓ |
| 8/22 | 1707086-19 | Weston | 0611 | 1h | ✓ | — |
| 8/22 | 1707161-06 | USA | 0714 | 1h | ✓ | — |
| 8/22 | 1707161-01 | USA | 0816 | 3h | ✓ | — |
| 8/22 | 1707087-01 | Weston | 0848 | 3h | ✓ | — |
| 8/22 | 1707087-02 | Weston | 0920 | 1h | ✓ | — |
| 8/22 | 1707087-09 | Weston | 1021 | 1h | ✓ | ✓ |
| 8/22 | 1707087-15 | Weston | 1121 | 1h | ✓ | — |
| 8/22/17 | 1707087-19 | Weston | 1223 | 1hr | ✓ | KB |

# SECTION VIII

# ANALYTICAL DATA (ISOTOPIC URANIUM)

# 17-07087
## UUISO
### Run 1



| | |
|---|---|
| Work Order | 17-07087 |
| Analysis Code | UUISO |
| Run | 1 |
| Date Received | 7/18/2017 |
| Lab Deadline | 8/10/2017 |
| Client | Weston Solutions, Inc. |
| Project | 94759 |
| Report Level | 4 |
| Activity Units | pCi |
| Aliquot Units | g |
| Matrix | SO |
| Method | EPA 908.0 Modified |
| Instrument Type | Alpha Spectroscopy |
| Radiometric Tracer | U-232 |
| Radiometric Sol# | U-10a |
| Tracer Act (dpm/g) | 18.32 |
| Carrier | |
| Carrier Conc (mg/ml) | |
| | |
| | |
| | |

| Internal Fraction | Sample Desc | Client ID | Login CPM | Sample Date | Sample Aliquot |
|---|---|---|---|---|---|
| 01 | LCS | LCS | | 07/19/17 00:00 | 1.0000E+00 |
| 02 | MBL | BLANK | | 07/19/17 00:00 | 1.0000E+00 |
| 03 | DUP | HTC-A03-S002-0006-01 | 49 | 05/15/17 09:39 | 1.1000E+00 |
| 04 | DO | HTC-A03-S002-0006-01 | 49 | 05/15/17 09:39 | 1.0900E+00 |
| 05 | TRG | HTC-A03-S002-0612-01 | 32 | 05/15/17 09:36 | 1.5300E+00 |
| 06 | TRG | HTC-A03-S002-1218-01 | 51 | 05/15/17 09:33 | 1.2900E+00 |
| 07 | TRG | HTC-A03-S002-1824-01 | 37 | 05/15/17 09:27 | 1.0300E+00 |
| 08 | TRG | HTC-A03-S002-2430-01 | 39 | 05/15/17 09:24 | 1.2500E+00 |
| 09 | MSO | HTC-A03-S002-3036-01 | 48 | 05/15/17 09:21 | 1.0060E+00 |
| 10 | MS | HTC-A03-S002-3036-01 | 34 | 05/15/17 09:39 | 1.0050E+00 |
| 11 | MSD | HTC-A03-S002-3036-01 MSD | 34 | 05/15/17 09:21 | 1.0070E+00 |
| 12 | TRG | HTC-A03-S002-3036-02 | 35 | 05/15/17 09:21 | 1.0600E+00 |
| 13 | TRG | HTC-A03-S002-3642-01 | 45 | 05/15/17 09:18 | 1.2100E+00 |
| 14 | TRG | HTC-A03-S002-4248-01 | 37 | 05/15/17 09:15 | 1.0800E+00 |
| 15 | TRG | HTC-A03-S003-0006-01 | 33 | 05/15/17 08:48 | 1.2000E+00 |
| 16 | TRG | HTC-A03-S003-0612-01 | 33 | 05/15/17 08:45 | 1.1200E+00 |
| 17 | TRG | HTC-A03-S003-1218-01 | 39 | 05/15/17 08:42 | 1.1400E+00 |
| 18 | TRG | HTC-A03-S003-1824-01 | 42 | 05/15/17 08:39 | 1.1800E+00 |
| 19 | TRG | HTC-A03-S003-2430-01 | 40 | 05/15/17 08:36 | 1.1900E+00 |
| 20 | TRG | HTC-A03-S003-3036-01 | 47 | 05/15/17 08:33 | 1.3600E+00 |

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

# 17-07087
## UUISO
### Run 1



| Internal Fraction | Sample Desc | Tracer Aliquot (g) | Tracer Total ACT (dpm) | Radiometric Tracer (pCi) | Radiometric % Rec | Grav Carrier Added (ml) | Grav Filter Tare (g) | Grav Filter Final (g) | Grav Filter Net (g) | Grav % Rec | Mean % Rec | SAF 1* | SAF 2* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | 0.6108 | 11.2 | | 0.00 | | | | | | | | |
| 02 | MBL | 0.6096 | 11.2 | | 0.00 | | | | | | | | |
| 03 | DUP | 0.6090 | 11.2 | | 0.00 | | | | | | | | |
| 04 | DO | 0.6085 | 11.1 | | 0.00 | | | | | | | | |
| 05 | TRG | 0.6085 | 11.1 | | 0.00 | | | | | | | | |
| 06 | TRG | 0.6064 | 11.1 | | 0.00 | | | | | | | | |
| 07 | TRG | 0.6081 | 11.1 | | 0.00 | | | | | | | | |
| 08 | TRG | 0.6071 | 11.1 | | 0.00 | | | | | | | | |
| 09 | MSO | 0.6090 | 11.2 | | 0.00 | | | | | | | | |
| 10 | MS | 0.6085 | 11.1 | | 0.00 | | | | | | | | |
| 11 | MSD | 0.6073 | 11.1 | | 0.00 | | | | | | | | |
| 12 | TRG | 0.6093 | 11.2 | | 0.00 | | | | | | | | |
| 13 | TRG | 0.6061 | 11.1 | | 0.00 | | | | | | | | |
| 14 | TRG | 0.6060 | 11.1 | | 0.00 | | | | | | | | |
| 15 | TRG | 0.6073 | 11.1 | | 0.00 | | | | | | | | |
| 16 | TRG | 0.6017 | 11.0 | | 0.00 | | | | | | | | |
| 17 | TRG | 0.6061 | 11.1 | | 0.00 | | | | | | | | |
| 18 | TRG | 0.6047 | 11.1 | | 0.00 | | | | | | | | |
| 19 | TRG | 0.6044 | 11.1 | | 0.00 | | | | | | | | |
| 20 | TRG | 0.6054 | 11.1 | | 0.00 | | | | | | | | |

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

# 17-07087
## UUISO
### Run 1



| Internal Fraction | Sample Desc | Rough Prep Date | Rough Prep By | Prep Date | Prep By | Sep t0 Date/Time | Sep t0 By | Sep t1 Date/Time | Sep t1 By |
|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | | | 08/14/17 06:10 | JHARVEY | | | | |
| 02 | MBL | | | 08/14/17 06:10 | JHARVEY | | | | |
| 03 | DUP | | | 08/14/17 06:10 | JHARVEY | | | | |
| 04 | DO | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 05 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 06 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 07 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 08 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 09 | MSO | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 10 | MS | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 11 | MSD | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 12 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 13 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 14 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 15 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 16 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 17 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 18 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 19 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |
| 20 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:10 | JHARVEY | | | | |

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1



Run: 1
Analysis Code: UUISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.

| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LCS Known | LCS %R | LCS Flag | RPD Flag | MDA Flag | Blank Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-234 | LCS | LCS | pCi/g | 6.39E+00 | 8.72E-01 | 7.61E-02 | 7.34E+00 | 87.04 | OK | | OK | |
| 02 | U-234 | MBL | BLANK | pCi/g | 8.27E-02 | 6.52E-02 | 5.93E-02 | | | | | OK | OK |
| 03 | U-234 | DUP | HTC-A03-S002-0006-01 | pCi/g | 6.13E-01 | 1.69E-01 | 6.44E-02 | | | | OK | OK | |
| 04 | U-234 | DO | HTC-A03-S002-0006-01 | pCi/g | 5.78E-01 | 1.87E-01 | 8.06E-02 | | | | | OK | |
| 05 | U-234 | TRG | HTC-A03-S002-0612-01 | pCi/g | 3.50E-01 | 1.12E-01 | 5.12E-02 | | | | | OK | |
| 06 | U-234 | TRG | HTC-A03-S002-1218-01 | pCi/g | 1.07E+00 | 2.30E-01 | 6.29E-02 | | | | | OK | |
| 07 | U-234 | TRG | HTC-A03-S002-1824-01 | pCi/g | 6.75E-01 | 2.42E-01 | 8.09E-02 | | | | | OK | |
| 08 | U-234 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.21E+00 | 2.61E-01 | 5.99E-02 | | | | | OK | |
| 09 | U-234 | MSO | HTC-A03-S002-3036-01 | pCi/g | 5.79E-01 | 1.98E-01 | 7.34E-02 | | | | | OK | |
| 10 | U-234 | MS | HTC-A03-S002-3036-01 | pCi/g | 6.56E+00 | 1.01E+00 | 1.09E-01 | | | | | OK | |
| 11 | U-234 | MSD | HTC-A03-S002-3036-01 MSD | pCi/g | 6.88E+00 | 9.93E-01 | 8.42E-02 | | | | | OK | |
| 12 | U-234 | TRG | HTC-A03-S002-3036-02 | pCi/g | 6.91E-01 | 2.13E-01 | 6.93E-02 | | | | | OK | |
| 13 | U-234 | TRG | HTC-A03-S002-3642-01 | pCi/g | 8.38E-01 | 2.22E-01 | 6.42E-02 | | | | | OK | |
| 14 | U-234 | TRG | HTC-A03-S002-4248-01 | pCi/g | 7.71E-01 | 2.31E-01 | 1.00E-01 | | | | | OK | |
| 15 | U-234 | TRG | HTC-A03-S003-0006-01 | pCi/g | 7.26E-01 | 1.92E-01 | 6.47E-02 | | | | | OK | |
| 16 | U-234 | TRG | HTC-A03-S003-0612-01 | pCi/g | 1.15E+00 | 2.73E-01 | 6.14E-02 | | | | | OK | |
| 17 | U-234 | TRG | HTC-A03-S003-1218-01 | pCi/g | 1.13E+00 | 2.56E-01 | 5.98E-02 | | | | | OK | |
| 18 | U-234 | TRG | HTC-A03-S003-1824-01 | pCi/g | 7.94E-01 | 1.97E-01 | 6.41E-02 | | | | | OK | |
| 19 | U-234 | TRG | HTC-A03-S003-2430-01 | pCi/g | 7.76E-01 | 2.03E-01 | 4.70E-02 | | | | | OK | |
| 20 | U-234 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.05E+00 | 2.28E-01 | 5.36E-02 | | | | | OK | |

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1

Run: 1
Analysis Code: UUISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.

| Lab Fraction | Nuclide | Sample Desc | Sample Date | Sample Aliquot | Radiometric % Rec | Grav % Rec | Mean % Rec | SAF | Sep t0 Date/Time | Sep t1 Date/Time |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-234 | LCS | 07/19/17 00:00 | 1.00E+00 | 118.67 | 0.00 | 0.00 | | | |
| 02 | U-234 | MBL | 07/19/17 00:00 | 1.00E+00 | 117.97 | 0.00 | 0.00 | | | |
| 03 | U-234 | DUP | 05/15/17 09:39 | 1.10E+00 | 125.95 | 0.00 | 0.00 | | | |
| 04 | U-234 | DO | 05/15/17 09:39 | 1.09E+00 | 101.11 | 0.00 | 0.00 | | | |
| 05 | U-234 | TRG | 05/15/17 09:36 | 1.53E+00 | 126.39 | 0.00 | 0.00 | | | |
| 06 | U-234 | TRG | 05/15/17 09:33 | 1.29E+00 | 125.82 | 0.00 | 0.00 | | | |
| 07 | U-234 | TRG | 05/15/17 09:27 | 1.03E+00 | 81.98 | 0.00 | 0.00 | | | |
| 08 | U-234 | TRG | 05/15/17 09:24 | 1.25E+00 | 122.48 | 0.00 | 0.00 | | | |
| 09 | U-234 | MSO | 05/15/17 09:21 | 1.01E+00 | 115.42 | 0.00 | 0.00 | | | |
| 10 | U-234 | MS | 05/15/17 09:39 | 1.01E+00 | 115.99 | 0.00 | 0.00 | | | |
| 11 | U-234 | MSD | 05/15/17 09:21 | 1.01E+00 | 107.96 | 0.00 | 0.00 | | | |
| 12 | U-234 | TRG | 05/15/17 09:21 | 1.06E+00 | 114.08 | 0.00 | 0.00 | | | |
| 13 | U-234 | TRG | 05/15/17 09:18 | 1.21E+00 | 131.52 | 0.00 | 0.00 | | | |
| 14 | U-234 | TRG | 05/15/17 09:15 | 1.08E+00 | 117.22 | 0.00 | 0.00 | | | |
| 15 | U-234 | TRG | 05/15/17 08:48 | 1.20E+00 | 117.77 | 0.00 | 0.00 | | | |
| 16 | U-234 | TRG | 05/15/17 08:45 | 1.12E+00 | 121.91 | 0.00 | 0.00 | | | |
| 17 | U-234 | TRG | 05/15/17 08:42 | 1.14E+00 | 149.92 | 0.00 | 0.00 | | | |
| 18 | U-234 | TRG | 05/15/17 08:39 | 1.18E+00 | 138.64 | 0.00 | 0.00 | | | |
| 19 | U-234 | TRG | 05/15/17 08:36 | 1.19E+00 | 120.28 | 0.00 | 0.00 | | | |
| 20 | U-234 | TRG | 05/15/17 08:33 | 1.36E+00 | 123.39 | 0.00 | 0.00 | | | |

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1



Run: 1
Analysis Code: UUISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.

| Lab Fraction | Nuclide | Sample Desc | Counting Date/Time | Halflife (days) | Detect | Carrier | Count Time | Counts | Bkg CPM | Eff |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-234 | LCS | 08/22/17 09:14 | | A_Spec | Alpha_039 | 170 | 5.29 E+02 | 6.00 E-03 | 18.5 |
| 02 | U-234 | MBL | 08/22/17 09:14 | | A_Spec | Alpha_040 | 170 | 6.66 E+00 | 2.00 E-03 | 18.1 |
| 03 | U-234 | DUP | 08/22/17 09:14 | | A_Spec | Alpha_043 | 170 | 6.00 E+01 | 6.00 E-03 | 18.7 |
| 04 | U-234 | DO | 08/22/17 09:15 | | A_Spec | Alpha_044 | 170 | 4.30 E+01 | 0.00 E+00 | 17.9 |
| 05 | U-234 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_045 | 170 | 4.30 E+01 | 6.00 E-03 | 16.9 |
| 06 | U-234 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_046 | 170 | 1.12 E+02 | 7.00 E-03 | 17.1 |
| 07 | U-234 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_047 | 170 | 3.48 E+01 | 1.00 E-03 | 16.2 |
| 08 | U-234 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_048 | 170 | 1.14 E+02 | 4.00 E-03 | 16.3 |
| 09 | U-234 | MSO | 08/22/17 09:15 | | A_Spec | Alpha_049 | 170 | 3.77 E+01 | 2.00 E-03 | 14.9 |
| 10 | U-234 | MS | 08/22/17 09:15 | | A_Spec | Alpha_050 | 170 | 4.13 E+02 | 8.00 E-03 | 14.3 |
| 11 | U-234 | MSD | 08/22/17 09:15 | | A_Spec | Alpha_052 | 170 | 4.89 E+02 | 5.00 E-03 | 17.4 |
| 12 | U-234 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_053 | 170 | 4.77 E+01 | 2.00 E-03 | 15.1 |
| 13 | U-234 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_054 | 170 | 6.85 E+01 | 3.00 E-03 | 13.6 |
| 14 | U-234 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_050 | 170 | 5.26 E+01 | 8.00 E-03 | 14.3 |
| 15 | U-234 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_052 | 170 | 6.72 E+01 | 5.00 E-03 | 17.4 |
| 16 | U-234 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_053 | 170 | 8.97 E+01 | 2.00 E-03 | 15.1 |
| 17 | U-234 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_054 | 170 | 9.95 E+01 | 3.00 E-03 | 13.6 |
| 18 | U-234 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_056 | 170 | 7.80 E+01 | 6.00 E-03 | 15.9 |
| 19 | U-234 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_057 | 170 | 6.88 E+01 | 1.00 E-03 | 16.5 |
| 20 | U-234 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_058 | 170 | 1.10 E+02 | 4.00 E-03 | 16.6 |

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1



Run: 1
Analysis Code: UUISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.

| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LCS Known | LCS %R | LCS Flag | RPD Flag | MDA Flag | Blank Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-238 | LCS | LCS | pCi/g | 6.29E+00 | 8.61E-01 | 7.93E-02 | 7.11E+00 | 88.42 | OK | | OK | |
| 02 | U-238 | MBL | BLANK | pCi/g | 4.94E-02 | 5.44E-02 | 7.41E-02 | | | | | OK | OK |
| 03 | U-238 | DUP | HTC-A03-S002-0006-01 | pCi/g | 3.53E-01 | 1.24E-01 | 4.87E-02 | | | | OK | OK | |
| 04 | U-238 | DO | HTC-A03-S002-0006-01 | pCi/g | 3.72E-01 | 1.45E-01 | 5.58E-02 | | | | | OK | |
| 05 | U-238 | TRG | HTC-A03-S002-0612-01 | pCi/g | 3.44E-01 | 1.11E-01 | 4.25E-02 | | | | | OK | |
| 06 | U-238 | TRG | HTC-A03-S002-1218-01 | pCi/g | 7.75E-01 | 1.88E-01 | 4.99E-02 | | | | | OK | |
| 07 | U-238 | TRG | HTC-A03-S002-1824-01 | pCi/g | 5.72E-01 | 2.21E-01 | 9.22E-02 | | | | | OK | |
| 08 | U-238 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.08E+00 | 2.41E-01 | 4.41E-02 | | | | | OK | |
| 09 | U-238 | MSO | HTC-A03-S002-3036-01 | pCi/g | 2.96E-01 | 1.39E-01 | 8.63E-02 | | | | | OK | |
| 10 | U-238 | MS | HTC-A03-S002-3036-01 | pCi/g | 7.18E+00 | 1.09E+00 | 1.13E-01 | | | | | OK | |
| 11 | U-238 | MSD | HTC-A03-S002-3036-01 MSD | pCi/g | 6.49E+00 | 9.47E-01 | 6.69E-02 | | | | | OK | |
| 12 | U-238 | TRG | HTC-A03-S002-3036-02 | pCi/g | 7.36E-01 | 2.22E-01 | 8.65E-02 | | | | | OK | |
| 13 | U-238 | TRG | HTC-A03-S002-3642-01 | pCi/g | 7.25E-01 | 2.03E-01 | 6.39E-02 | | | | | OK | |
| 14 | U-238 | TRG | HTC-A03-S002-4248-01 | pCi/g | 5.17E-01 | 1.85E-01 | 1.04E-01 | | | | | OK | |
| 15 | U-238 | TRG | HTC-A03-S003-0006-01 | pCi/g | 7.82E-01 | 2.00E-01 | 5.15E-02 | | | | | OK | |
| 16 | U-238 | TRG | HTC-A03-S003-0612-01 | pCi/g | 9.46E-01 | 2.43E-01 | 7.67E-02 | | | | | OK | |
| 17 | U-238 | TRG | HTC-A03-S003-1218-01 | pCi/g | 9.13E-01 | 2.24E-01 | 5.95E-02 | | | | | OK | |
| 18 | U-238 | TRG | HTC-A03-S003-1824-01 | pCi/g | 8.63E-01 | 2.06E-01 | 6.07E-02 | | | | | OK | |
| 19 | U-238 | TRG | HTC-A03-S003-2430-01 | pCi/g | 9.61E-01 | 2.30E-01 | 5.36E-02 | | | | | OK | |
| 20 | U-238 | TRG | HTC-A03-S003-3036-01 | pCi/g | 9.43E-01 | 2.13E-01 | 6.49E-02 | | | | | OK | |

9800

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1

Client: Weston Solutions, Inc.
Eberline Analytical Work Order: 17-07087
Analysis Code: UUISO
Run: 1

| Lab Fraction | Nuclide | Sample Desc | Sample Date | Sample Aliquot | Radiometric % Rec | Grav % Rec | Mean % Rec | SAF | Sep t0 Date/Time | Sep t1 Date/Time |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-238 | LCS | 07/19/17 00:00 | 1.00E+00 | 118.67 | 0.00 | 0.00 | | | |
| 02 | U-238 | MBL | 07/19/17 00:00 | 1.00E+00 | 117.97 | 0.00 | 0.00 | | | |
| 03 | U-238 | DUP | 05/15/17 09:39 | 1.10E+00 | 125.95 | 0.00 | 0.00 | | | |
| 04 | U-238 | DO | 05/15/17 09:39 | 1.09E+00 | 101.11 | 0.00 | 0.00 | | | |
| 05 | U-238 | TRG | 05/15/17 09:36 | 1.53E+00 | 126.39 | 0.00 | 0.00 | | | |
| 06 | U-238 | TRG | 05/15/17 09:33 | 1.29E+00 | 125.82 | 0.00 | 0.00 | | | |
| 07 | U-238 | TRG | 05/15/17 09:27 | 1.03E+00 | 81.98 | 0.00 | 0.00 | | | |
| 08 | U-238 | TRG | 05/15/17 09:24 | 1.25E+00 | 122.48 | 0.00 | 0.00 | | | |
| 09 | U-238 | MSO | 05/15/17 09:21 | 1.01E+00 | 115.42 | 0.00 | 0.00 | | | |
| 10 | U-238 | MS | 05/15/17 09:39 | 1.01E+00 | 115.99 | 0.00 | 0.00 | | | |
| 11 | U-238 | MSD | 05/15/17 09:21 | 1.01E+00 | 107.96 | 0.00 | 0.00 | | | |
| 12 | U-238 | TRG | 05/15/17 09:21 | 1.06E+00 | 114.08 | 0.00 | 0.00 | | | |
| 13 | U-238 | TRG | 05/15/17 09:18 | 1.21E+00 | 131.52 | 0.00 | 0.00 | | | |
| 14 | U-238 | TRG | 05/15/17 09:15 | 1.08E+00 | 117.22 | 0.00 | 0.00 | | | |
| 15 | U-238 | TRG | 05/15/17 08:48 | 1.20E+00 | 117.77 | 0.00 | 0.00 | | | |
| 16 | U-238 | TRG | 05/15/17 08:45 | 1.12E+00 | 121.91 | 0.00 | 0.00 | | | |
| 17 | U-238 | TRG | 05/15/17 08:42 | 1.14E+00 | 149.92 | 0.00 | 0.00 | | | |
| 18 | U-238 | TRG | 05/15/17 08:39 | 1.18E+00 | 138.64 | 0.00 | 0.00 | | | |
| 19 | U-238 | TRG | 05/15/17 08:36 | 1.19E+00 | 120.28 | 0.00 | 0.00 | | | |
| 20 | U-238 | TRG | 05/15/17 08:33 | 1.36E+00 | 123.39 | 0.00 | 0.00 | | | |

Z800

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1



Run: 1
Analysis Code: UUISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.

| Lab Fraction | Nuclide | Sample Desc | Counting Date/Time | Halflife (days) | Detect | Carrier | Count Time | Counts | Bkg CPM | Eff |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-238 | LCS | 08/22/17 09:14 | | A_Spec | Alpha_039 | 170 | 5.23 E+02 | 7.00 E-03 | 18.5 |
| 02 | U-238 | MBL | 08/22/17 09:14 | | A_Spec | Alpha_040 | 170 | 4.00 E+00 | 0.00 E+00 | 18.1 |
| 03 | U-238 | DUP | 08/22/17 09:14 | | A_Spec | Alpha_043 | 170 | 3.47 E+01 | 2.00 E-03 | 18.7 |
| 04 | U-238 | DO | 08/22/17 09:15 | | A_Spec | Alpha_044 | 170 | 2.78 E+01 | 1.00 E-03 | 17.9 |
| 05 | U-238 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_045 | 170 | 4.25 E+01 | 3.00 E-03 | 16.9 |
| 06 | U-238 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_046 | 170 | 8.15 E+01 | 3.00 E-03 | 17.1 |
| 07 | U-238 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_047 | 170 | 2.97 E+01 | 2.00 E-03 | 16.2 |
| 08 | U-238 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_048 | 170 | 1.02 E+02 | 1.00 E-03 | 16.3 |
| 09 | U-238 | MSO | 08/22/17 09:15 | | A_Spec | Alpha_049 | 170 | 1.93 E+01 | 4.00 E-03 | 14.9 |
| 10 | U-238 | MS | 08/22/17 09:15 | | A_Spec | Alpha_050 | 170 | 4.53 E+02 | 9.00 E-03 | 14.3 |
| 11 | U-238 | MSD | 08/22/17 09:15 | | A_Spec | Alpha_052 | 170 | 4.64 E+02 | 2.00 E-03 | 17.4 |
| 12 | U-238 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_053 | 170 | 5.10 E+01 | 0.00 E+00 | 15.1 |
| 13 | U-238 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_054 | 170 | 5.95 E+01 | 3.00 E-03 | 13.6 |
| 14 | U-238 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_050 | 170 | 3.55 E+01 | 9.00 E-03 | 14.3 |
| 15 | U-238 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_052 | 170 | 7.27 E+01 | 2.00 E-03 | 17.4 |
| 16 | U-238 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_053 | 170 | 7.40 E+01 | 0.00 E+00 | 15.1 |
| 17 | U-238 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_054 | 170 | 8.05 E+01 | 3.00 E-03 | 13.6 |
| 18 | U-238 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_056 | 170 | 8.52 E+01 | 5.00 E-03 | 15.9 |
| 19 | U-238 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_057 | 170 | 8.57 E+01 | 2.00 E-03 | 16.5 |
| 20 | U-238 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_058 | 170 | 9.96 E+01 | 8.00 E-03 | 16.6 |

Eberline Analytical
Oak Ridge Laboratory

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1



Run: 1
Analysis Code: UUISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
6800

| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LCS Known | LCS %R | LCS Flag | RPD Flag | MDA Flag | Blank Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-235 | LCS | LCS | pCi/g | 5.71E-01 | 1.93E-01 | 8.41E-02 | | | | | OK | |
| 02 | U-235 | MBL | BLANK | pCi/g | -5.21E-03 | 3.09E-02 | 7.32E-02 | | | | | OK | OK |
| 03 | U-235 | DUP | HTC-A03-S002-0006-01 | pCi/g | -8.58E-03 | 2.61E-02 | 7.11E-02 | | | | NA | OK | |
| 04 | U-235 | DO | HTC-A03-S002-0006-01 | pCi/g | 4.97E-02 | 6.52E-02 | 9.94E-02 | | | | | OK | |
| 05 | U-235 | TRG | HTC-A03-S002-0612-01 | pCi/g | 5.85E-02 | 4.87E-02 | 4.19E-02 | | | | | OK | |
| 06 | U-235 | TRG | HTC-A03-S002-1218-01 | pCi/g | 4.31E-02 | 4.67E-02 | 5.63E-02 | | | | | OK | |
| 07 | U-235 | TRG | HTC-A03-S002-1824-01 | pCi/g | 6.36E-02 | 8.24E-02 | 1.14E-01 | | | | | OK | |
| 08 | U-235 | TRG | HTC-A03-S002-2430-01 | pCi/g | -6.68E-03 | 2.68E-02 | 6.87E-02 | | | | | OK | |
| 09 | U-235 | MSO | HTC-A03-S002-3036-01 | pCi/g | 2.84E-03 | 3.97E-02 | 1.13E-01 | | | | | OK | |
| 10 | U-235 | MS | HTC-A03-S002-3036-01 | pCi/g | 5.00E-01 | 2.05E-01 | 1.03E-01 | | | | | OK | |
| 11 | U-235 | MSD | HTC-A03-S002-3036-01 MSD | pCi/g | 4.25E-01 | 1.77E-01 | 9.10E-02 | | | | | OK | |
| 12 | U-235 | TRG | HTC-A03-S002-3036-02 | pCi/g | 1.48E-02 | 3.56E-02 | 7.46E-02 | | | | | OK | |
| 13 | U-235 | TRG | HTC-A03-S002-3642-01 | pCi/g | 9.80E-02 | 7.96E-02 | 7.92E-02 | | | | | OK | |
| 14 | U-235 | TRG | HTC-A03-S002-4248-01 | pCi/g | 9.92E-02 | 8.81E-02 | 9.48E-02 | | | | | OK | |
| 15 | U-235 | TRG | HTC-A03-S003-0006-01 | pCi/g | 9.99E-02 | 7.52E-02 | 7.00E-02 | | | | | OK | |
| 16 | U-235 | TRG | HTC-A03-S003-0612-01 | pCi/g | 1.08E-01 | 8.32E-02 | 6.61E-02 | | | | | OK | |
| 17 | U-235 | TRG | HTC-A03-S003-1218-01 | pCi/g | 9.12E-02 | 7.40E-02 | 7.38E-02 | | | | | OK | |
| 18 | U-235 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.44E-02 | 3.61E-02 | 7.52E-02 | | | | | OK | |
| 19 | U-235 | TRG | HTC-A03-S003-2430-01 | pCi/g | 6.95E-02 | 6.72E-02 | 8.33E-02 | | | | | OK | |
| 20 | U-235 | TRG | HTC-A03-S003-3036-01 | pCi/g | 7.03E-02 | 6.13E-02 | 7.03E-02 | | | | | OK | |

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1

Run: 1
Analysis Code: UUISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.

| Lab Fraction | Nuclide | Sample Desc | Sample Date | Sample Aliquot | Radiometric % Rec | Grav % Rec | Mean % Rec | SAF | Sep t0 Date/Time | Sep t1 Date/Time |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-235 | LCS | 07/19/17 00:00 | 1.00E+00 | 118.67 | 0.00 | 0.00 | | | |
| 02 | U-235 | MBL | 07/19/17 00:00 | 1.00E+00 | 117.97 | 0.00 | 0.00 | | | |
| 03 | U-235 | DUP | 05/15/17 09:39 | 1.10E+00 | 125.95 | 0.00 | 0.00 | | | |
| 04 | U-235 | DO | 05/15/17 09:39 | 1.09E+00 | 101.11 | 0.00 | 0.00 | | | |
| 05 | U-235 | TRG | 05/15/17 09:36 | 1.53E+00 | 126.39 | 0.00 | 0.00 | | | |
| 06 | U-235 | TRG | 05/15/17 09:33 | 1.29E+00 | 125.82 | 0.00 | 0.00 | | | |
| 07 | U-235 | TRG | 05/15/17 09:27 | 1.03E+00 | 81.98 | 0.00 | 0.00 | | | |
| 08 | U-235 | TRG | 05/15/17 09:24 | 1.25E+00 | 122.48 | 0.00 | 0.00 | | | |
| 09 | U-235 | MSO | 05/15/17 09:21 | 1.01E+00 | 115.42 | 0.00 | 0.00 | | | |
| 10 | U-235 | MS | 05/15/17 09:39 | 1.01E+00 | 115.99 | 0.00 | 0.00 | | | |
| 11 | U-235 | MSD | 05/15/17 09:21 | 1.01E+00 | 107.96 | 0.00 | 0.00 | | | |
| 12 | U-235 | TRG | 05/15/17 09:21 | 1.06E+00 | 114.08 | 0.00 | 0.00 | | | |
| 13 | U-235 | TRG | 05/15/17 09:18 | 1.21E+00 | 131.52 | 0.00 | 0.00 | | | |
| 14 | U-235 | TRG | 05/15/17 09:15 | 1.08E+00 | 117.22 | 0.00 | 0.00 | | | |
| 15 | U-235 | TRG | 05/15/17 08:48 | 1.20E+00 | 117.77 | 0.00 | 0.00 | | | |
| 16 | U-235 | TRG | 05/15/17 08:45 | 1.12E+00 | 121.91 | 0.00 | 0.00 | | | |
| 17 | U-235 | TRG | 05/15/17 08:42 | 1.14E+00 | 149.92 | 0.00 | 0.00 | | | |
| 18 | U-235 | TRG | 05/15/17 08:39 | 1.18E+00 | 138.64 | 0.00 | 0.00 | | | |
| 19 | U-235 | TRG | 05/15/17 08:36 | 1.19E+00 | 120.28 | 0.00 | 0.00 | | | |
| 20 | U-235 | TRG | 05/15/17 08:33 | 1.36E+00 | 123.39 | 0.00 | 0.00 | | | |

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-UUISO-1

Run: 1
Analysis Code: UUISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.

| Lab Fraction | Nuclide | Sample Desc | Counting Date/Time | Halflife (days) | Detect | Carrier | Count Time | Counts | Bkg CPM | Eff |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | U-235 | LCS | 08/22/17 09:14 | | A_Spec | Alpha_039 | 170 | 3.83 E+01 | 4.00 E-03 | 18.5 |
| 02 | U-235 | MBL | 08/22/17 09:14 | | A_Spec | Alpha_040 | 170 | -3.40 E-01 | 2.00 E-03 | 18.1 |
| 03 | U-235 | DUP | 08/22/17 09:14 | | A_Spec | Alpha_043 | 170 | -6.80 E-01 | 4.00 E-03 | 18.7 |
| 04 | U-235 | DO | 08/22/17 09:15 | | A_Spec | Alpha_044 | 170 | 3.00 E+00 | 0.00 E+00 | 17.9 |
| 05 | U-235 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_045 | 170 | 5.83 E+00 | 1.00 E-03 | 16.9 |
| 06 | U-235 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_046 | 170 | 3.66 E+00 | 2.00 E-03 | 17.1 |
| 07 | U-235 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_047 | 170 | 2.66 E+00 | 2.00 E-03 | 16.2 |
| 08 | U-235 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_048 | 170 | -5.10 E-01 | 3.00 E-03 | 16.3 |
| 09 | U-235 | MSO | 08/22/17 09:15 | | A_Spec | Alpha_049 | 170 | 1.50 E-01 | 5.00 E-03 | 14.9 |
| 10 | U-235 | MS | 08/22/17 09:15 | | A_Spec | Alpha_050 | 170 | 2.55 E+01 | 3.00 E-03 | 14.3 |
| 11 | U-235 | MSD | 08/22/17 09:15 | | A_Spec | Alpha_052 | 170 | 2.45 E+01 | 3.00 E-03 | 17.4 |
| 12 | U-235 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_053 | 170 | 8.30 E-01 | 1.00 E-03 | 15.1 |
| 13 | U-235 | TRG | 08/22/17 09:15 | | A_Spec | Alpha_054 | 170 | 6.49 E+00 | 3.00 E-03 | 13.6 |
| 14 | U-235 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_050 | 170 | 5.49 E+00 | 3.00 E-03 | 14.3 |
| 15 | U-235 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_052 | 170 | 7.49 E+00 | 3.00 E-03 | 17.4 |
| 16 | U-235 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_053 | 170 | 6.83 E+00 | 1.00 E-03 | 15.1 |
| 17 | U-235 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_054 | 170 | 6.49 E+00 | 3.00 E-03 | 13.6 |
| 18 | U-235 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_056 | 170 | 1.15 E+00 | 5.00 E-03 | 15.9 |
| 19 | U-235 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_057 | 170 | 5.00 E+00 | 0.00 E+00 | 16.5 |
| 20 | U-235 | TRG | 08/22/17 12:17 | | A_Spec | Alpha_058 | 170 | 6.00 E+00 | 0.00 E+00 | 16.6 |

Count Room Report
Client: Weston Solutions, Inc.

17-07087-UUISO-1 (pCi/g) in SO
Tracer ID: U-10a



| Internal Fraction | Sample Desc | Client ID | Sample Date | Sample Aliquot | Tracer Aliquot (g) | Tracer ACT (dpm) | Radiometric Tracer (pCi) | Radiometric % Rec | SAF 1* | SAF 2* |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | LCS | 07/19/17 00:00 | 1.0000 | 0.6108 | 11.1899 | | 0.00 | | |
| 02 | MBL | BLANK | 07/19/17 00:00 | 1.0000 | 0.6096 | 11.1679 | | 0.00 | | |
| 03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 1.1000 | 0.6090 | 11.1569 | | 0.00 | | |
| 04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 1.0900 | 0.6085 | 11.1477 | | 0.00 | | |
| 05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 1.5300 | 0.6085 | 11.1477 | | 0.00 | | |
| 06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 1.2900 | 0.6064 | 11.1092 | | 0.00 | | |
| 07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 1.0300 | 0.6081 | 11.1404 | | 0.00 | | |
| 08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 1.2500 | 0.6071 | 11.1221 | | 0.00 | | |
| 09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 1.0060 | 0.6090 | 11.1569 | | 0.00 | | |
| 10 | MS | HTC-A03-S002-3036-01 | 05/15/17 09:39 | 1.0050 | 0.6085 | 11.1477 | | 0.00 | | |
| 11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 1.0070 | 0.6073 | 11.1257 | | 0.00 | | |
| 12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 1.0600 | 0.6093 | 11.1624 | | 0.00 | | |
| 13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 1.2100 | 0.6061 | 11.1038 | | 0.00 | | |
| 14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 1.0800 | 0.6060 | 11.1019 | | 0.00 | | |
| 15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 1.2000 | 0.6073 | 11.1257 | | 0.00 | | |
| 16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 1.1200 | 0.6017 | 11.0231 | | 0.00 | | |
| 17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 1.1400 | 0.6061 | 11.1038 | | 0.00 | | |
| 18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 1.1800 | 0.6047 | 11.0781 | | 0.00 | | |
| 19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 1.1900 | 0.6044 | 11.0726 | | 0.00 | | |
| 20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 1.3600 | 0.6054 | 11.0909 | | 0.00 | | |

39

0914

#52-57

0092

Eberline Analytical
Oak Ridge Laboratory

# Spike and Tracer Worksheet


Printed: 8/14/2017 6:10 AM

| Internal Work Order | Run | Analysis Code | Date | Technician | Technician Initials | Witness Initials |
|---|---|---|---|---|---|---|
| 17-07087 | 1 | UUISO | 8/14/2017 6:08 | JHARVEY | | |

| LCS & Matrix Spikes | | | | | LCS | MS | LCSD | MSD | LCS | | MS | | LCSD | | MSD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Isotope | Sol # | Activity dpm/g | Solution Date | Approx Addition | Volume Used (g) | Volume Used (g) | Volume Used (g) | Volume Used (g) | Known pCi | Error Estimate | Added pCi | Error Estimate | Known pCi | Error Estimate | Added pCi | Error Estimate |
| U-234 | U-8a | 32.000 | 8/14/2017 | 0.550 | 0.5094 | 0.5094 | | 0.5099 | 7.34 | 0.264 | 7.34 | 0.264 | 0.00 | 0.000 | 7.35 | 0.265 |
| U-238 | U-8a | 31.000 | 8/14/2017 | 0.550 | 0.5094 | 0.5094 | | 0.5099 | 7.11 | 0.256 | 7.11 | 0.256 | 0.00 | 0.000 | 7.12 | 0.256 |
| | | | | | | | | | | | | | | | | |

## Tracers

| fraction | Isotope | Sol # | Activity dpm/g | Solution Date | Volume Used (g) | Approx Addition |
|---|---|---|---|---|---|---|
| 01 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6108 | 0.6600 |
| 02 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6096 | 0.6600 |
| 03 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6090 | 0.6600 |
| 04 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6085 | 0.6600 |
| 05 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6085 | 0.6600 |
| 06 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6064 | 0.6600 |
| 07 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6081 | 0.6600 |
| 08 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6071 | 0.6600 |
| 09 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6090 | 0.6600 |
| 10 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6085 | 0.6600 |
| 11 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6073 | 0.6600 |
| 12 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6093 | 0.6600 |
| 13 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6061 | 0.6600 |
| 14 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6060 | 0.6600 |
| 15 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6073 | 0.6600 |
| 16 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6017 | 0.6600 |
| 17 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6061 | 0.6600 |
| 18 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6047 | 0.6600 |
| 19 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6044 | 0.6600 |
| 20 | U-232 | U-10a | 18.320 | 8/14/2017 | 0.6054 | 0.6600 |

## Balance Printer Tapes

**Tracer**

0.6108 g
0.6096 g
0.6090 g
0.6085 g
0.6085 g
0.6064 g
0.6081 g
0.6071 g
0.6090 g
0.6085 g
0.6073 g
0.6093 g
0.6061 g
0.6060 g
0.6073 g
0.6017 g
0.6061 g
0.6047 g
0.6044 g
0.6054 g

**LCS**

0.5094 g

**Matrix Spike**

0.5094 g
0.5099 g

0093

Eberline Analytical
Oak Ridge Laboratory

# Aliquot Worksheet



| Work Order | Run | Analysis Code | Rpt Units | Lab Deadline | Technician |
|---|---|---|---|---|---|
| 17-07087 | 1 | UUISO | grams | 8/10/2017 | JHARVEY |

| Lab Fraction | Weston Solutions, Inc. Client ID | Sample Type | Muffle Data Ratio Post/Pre | Dilution Data No of Dils | Dil Factor | Ratio | Aliquot Data Aliquot | Net Equiv | MS Aliquot Data Aliquot | Net Equiv | H-3 Solids Only Water Added (ml) | H3 Dist Aliq |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | LCS | | | | 1.00E+00 | 1.0000E+00 | 1.0000E+00 | | | | |
| 02 | BLANK | MBL | | | | 1.00E+00 | 1.0000E+00 | 1.0000E+00 | | | | |
| 03 | HTC-A03-S002-0006-01 | DUP | | | | 1.00E+00 | 1.1000E+00 | 1.1000E+00 | | | | |
| 04 | HTC-A03-S002-0006-01 | DO | | | | 1.00E+00 | 1.0900E+00 | 1.0900E+00 | | | | |
| 05 | HTC-A03-S002-0612-01 | TRG | | | | 1.00E+00 | 1.5300E+00 | 1.5300E+00 | | | | |
| 06 | HTC-A03-S002-1218-01 | TRG | | | | 1.00E+00 | 1.2900E+00 | 1.2900E+00 | | | | |
| 07 | HTC-A03-S002-1824-01 | TRG | | | | 1.00E+00 | 1.0300E+00 | 1.0300E+00 | | | | |
| 08 | HTC-A03-S002-2430-01 | TRG | | | | 1.00E+00 | 1.2500E+00 | 1.2500E+00 | | | | |
| 09 | HTC-A03-S002-3036-01 | MSO | | | | 1.00E+00 | 1.0060E+00 | 1.0060E+00 | | | | |
| 10 | HTC-A03-S002-3036-01 MS | MS | | | | 1.00E+00 | 1.0050E+00 | 1.0050E+00 | | | | |
| 11 | HTC-A03-S002-3036-01 MSD | MSD | | | | 1.00E+00 | 1.0070E+00 | 1.0070E+00 | | | | |
| 12 | HTC-A03-S002-3036-02 | TRG | | | | 1.00E+00 | 1.0600E+00 | 1.0600E+00 | | | | |
| 13 | HTC-A03-S002-3642-01 | TRG | | | | 1.00E+00 | 1.2100E+00 | 1.2100E+00 | | | | |
| 14 | HTC-A03-S002-4248-01 | TRG | | | | 1.00E+00 | 1.0800E+00 | 1.0800E+00 | | | | |
| 15 | HTC-A03-S003-0006-01 | TRG | | | | 1.00E+00 | 1.2000E+00 | 1.2000E+00 | | | | |
| 16 | HTC-A03-S003-0612-01 | TRG | | | | 1.00E+00 | 1.1200E+00 | 1.1200E+00 | | | | |
| 17 | HTC-A03-S003-1218-01 | TRG | | | | 1.00E+00 | 1.1400E+00 | 1.1400E+00 | | | | |
| 18 | HTC-A03-S003-1824-01 | TRG | | | | 1.00E+00 | 1.1800E+00 | 1.1800E+00 | | | | |
| 19 | HTC-A03-S003-2430-01 | TRG | | | | 1.00E+00 | 1.1900E+00 | 1.1900E+00 | | | | |
| 20 | HTC-A03-S003-3036-01 | TRG | | | | 1.00E+00 | 1.3600E+00 | 1.3600E+00 | | | | |

| Comments | |
|---|---|

0094

Technician: JHarvey Date: 8/14/17

Eberline Services - Oak Ridge
Prep Logbook
Version 2.0 8/1999

# Rough Sample Preparation Log Book



| Work Order | Lab Deadline | Date Received in Prep | Date Sealed | Date Returned | Technician |
|---|---|---|---|---|---|
| 17-07087 | 8/10/2017 | 7/31/2017 | 8/1/2017 | 8/2/2017 | KSALLINGS |

Bico Pulverizer: 000302 [✓] Jaw Crusher 68275 [ ]

| Eberline Fraction | Weston Solutions, Inc. Client ID | Tare (g) Pan Wt | Gross (g) Wet Wt. | Gross (g) Dry Wt. | Net (g) Wet Wt. | Net (g) Dry Wt. | Percent Liquid | Percent Solid | Gamma Dry Wt. | Gamma LEPS Wt. | Special Info |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 04 | HTC-A03-S002-0006-01 | 14.6400 | 1033.2200 | 900.0000 | 1018.5800 | 885.3600 | 13.08% | 86.92% | 0.0000 | 0.0000 | |
| 05 | HTC-A03-S002-0612-01 | 14.6200 | 985.7200 | 901.2600 | 971.1000 | 886.6400 | 8.70% | 91.30% | 0.0000 | 0.0000 | |
| 06 | HTC-A03-S002-1218-01 | 14.5900 | 1011.0600 | 869.2800 | 996.4700 | 854.6900 | 14.23% | 85.77% | 0.0000 | 0.0000 | |
| 07 | HTC-A03-S002-1824-01 | 14.6400 | 959.0000 | 786.5200 | 944.3600 | 771.8800 | 18.26% | 81.74% | 0.0000 | 0.0000 | |
| 08 | HTC-A03-S002-2430-01 | 14.6700 | 975.4000 | 778.3000 | 960.7300 | 763.6300 | 20.52% | 79.48% | 0.0000 | 0.0000 | |
| 09 | HTC-A03-S002-3036-01 | 14.6500 | 1039.9200 | 835.9600 | 1025.2700 | 821.3100 | 19.89% | 80.11% | 0.0000 | 0.0000 | |
| 10 | HTC-A03-S002-3036-01 MS | 14.6300 | 1041.0600 | 837.2200 | 1026.4300 | 822.5900 | 19.86% | 80.14% | 0.0000 | 0.0000 | |
| 11 | HTC-A03-S002-3036-01 MSD | 14.6300 | 1041.0600 | 837.2200 | 1026.4300 | 822.5900 | 19.86% | 80.14% | 0.0000 | 0.0000 | |
| 12 | HTC-A03-S002-3036-02 | 14.6100 | 1055.0000 | 849.4000 | 1040.3900 | 834.7900 | 19.76% | 80.24% | 0.0000 | 0.0000 | |
| 13 | HTC-A03-S002-3642-01 | 14.6200 | 1050.1600 | 852.9800 | 1035.5400 | 838.3600 | 19.04% | 80.96% | 0.0000 | 0.0000 | |
| 14 | HTC-A03-S002-4248-01 | 14.6000 | 1044.5000 | 851.5800 | 1029.9000 | 836.9800 | 18.73% | 81.27% | 0.0000 | 0.0000 | |
| 15 | HTC-A03-S003-0006-01 | 14.5200 | 948.8000 | 716.8200 | 934.2800 | 702.3000 | 24.83% | 75.17% | 0.0000 | 0.0000 | |
| 16 | HTC-A03-S003-0612-01 | 14.5100 | 997.5000 | 781.2900 | 982.9900 | 766.7800 | 22.00% | 78.00% | 0.0000 | 0.0000 | |
| 17 | HTC-A03-S003-1218-01 | 14.4900 | 1025.8600 | 819.9600 | 1011.3700 | 805.4700 | 20.36% | 79.64% | 0.0000 | 0.0000 | |
| 18 | HTC-A03-S003-1824-01 | 14.5300 | 1023.6600 | 832.7600 | 1009.1300 | 818.2300 | 18.92% | 81.08% | 0.0000 | 0.0000 | |
| 19 | HTC-A03-S003-2430-01 | 14.6300 | 916.4000 | 754.6300 | 901.7700 | 740.0000 | 17.94% | 82.06% | 0.0000 | 0.0000 | |
| 20 | HTC-A03-S003-3036-01 | 14.5400 | 925.6400 | 765.7600 | 911.1000 | 751.2200 | 17.55% | 82.45% | 0.0000 | 0.0000 | |

OVENS Fisher Isotemp SN 00579 [✓] VWR SN 000588 [ ]

| | |
|---|---|
| *Comments* | |
| *Special Codes* | **H: Hot, O: Organic Hazard, P: PCB Hazard, R: Rush, T: Other (see comments)** |

0095

Technician: Kerry Sallings

Date: **Analysis: Rough Prep Logbook**

Apex-Alpha™

NB 8/22/17

Sample Description: SPIKE
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 01
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_039
Chamber Serial Number: 06027396A
Detector Serial Number: 83109
Env. Background: System Bkgd 194213
Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 gram
Sample Date/Time: 8/22/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:14:55 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.611 mL
Effective Efficiency: 0.2198 +/- 0.0119
Counting Efficiency: 0.1852 +/- 0.0031 on 11/18/2016 10:08:50 AM
Chem. Recovery Factor: 1.1867 +/- 0.0676

Control Certificate Name: NatU_U-8A
Chem. Recov. of Control: U-238 0.777833 +/- 0.059104
Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.263 | 414.79 | 9.65 | 2.21 | 0.00E+000 | 33.3 |
| U-234 | | 4.716 | 528.98 | 8.53 | 1.02 | 0.00E+000 | 35.2 |
| U-235 | | 4.380 | 38.32 | 31.99 | 0.68 | 0.00E+000 | 6.0 |
| U-238 | | 4.143 | 522.81 | 8.58 | 1.19 | 0.00E+000 | 48.2 |

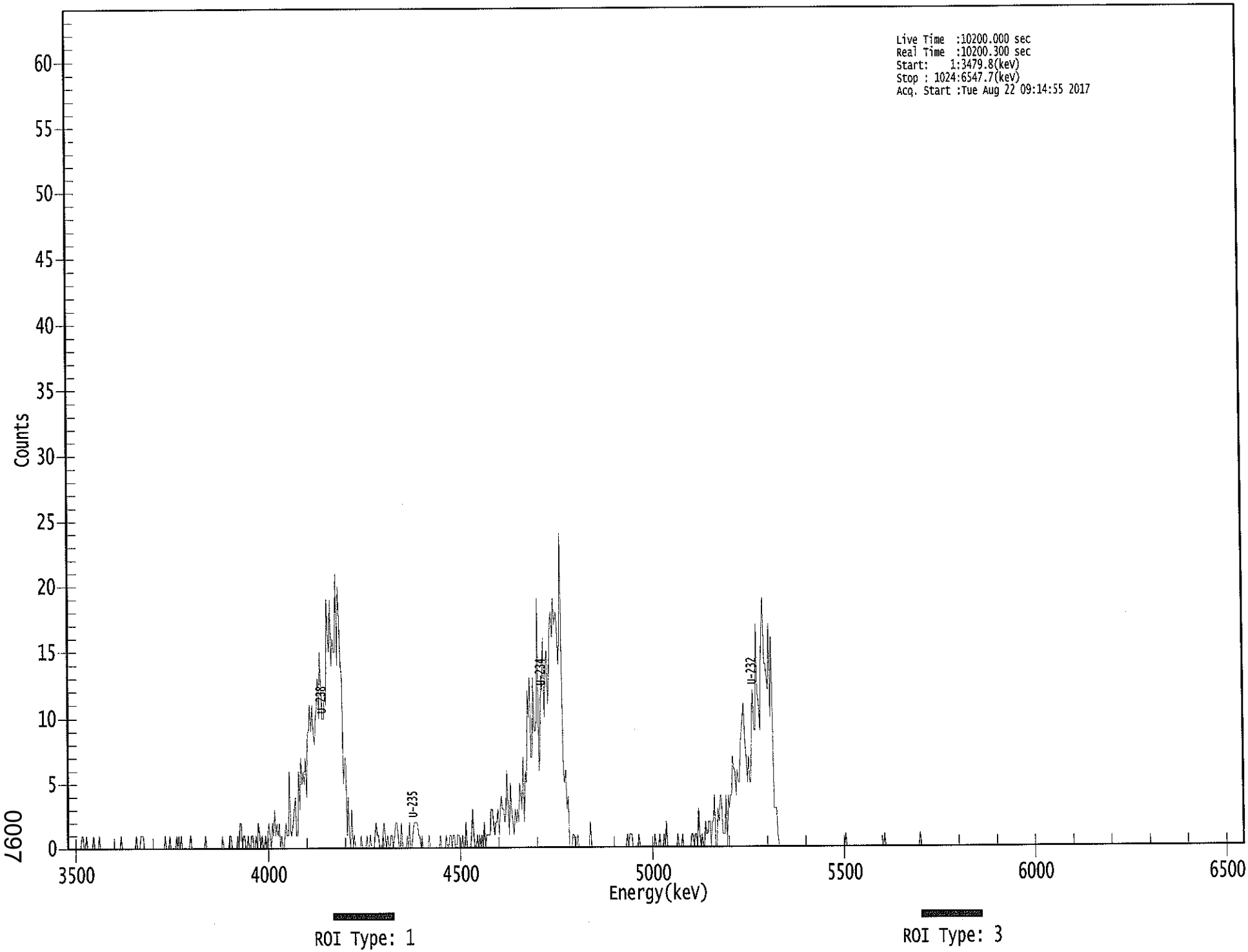
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.989 | 5302.50* | 5.01E+000 +/- 5.34E-001 | 9.66E-002 +/- 1.03E-002 |
| U-234 | 0.985 | 4761.50* | 6.39E+000 +/- 8.72E-001 | 7.61E-002 +/- 8.11E-003 |
| U-235 | 1.000 | 4385.50* | 5.71E-001 +/- 1.93E-001 | 8.41E-002 +/- 8.96E-003 |
| U-238 | 0.988 | 4184.40* | 6.29E+000 +/- 8.61E-001 | 7.93E-002 +/- 8.45E-003 |

AG 8/23/17

0000192224.CNF




0097

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 01

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 17: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 25: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 65: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 89: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 97: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 137: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 145: | 0 | 0 | 0 | 1 | 0 | 2 | 2 | 0 |
| 153: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 161: | 1 | 0 | 0 | 1 | 0 | 2 | 1 | 0 |
| 169: | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 1 |
| 177: | 0 | 2 | 1 | 3 | 1 | 2 | 1 | 2 |
| 185: | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 1 |
| 193: | 6 | 1 | 1 | 2 | 3 | 4 | 1 | 1 |
| 201: | 6 | 3 | 7 | 5 | 6 | 5 | 7 | 4 |
| 209: | 9 | 9 | 11 | 9 | 11 | 9 | 8 | 10 |
| 217: | 11 | 13 | 10 | 15 | 12 | 10 | 10 | 12 |
| 225: | 11 | 19 | 16 | 15 | 19 | 14 | 16 | 15 |
| 233: | 15 | 21 | 14 | 20 | 17 | 14 | 13 | 5 |
| 241: | 7 | 7 | 1 | 4 | 1 | 0 | 3 | 0 |
| 249: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 257: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 265: | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 0 |
| 273: | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 0 |
| 281: | 1 | 1 | 0 | 1 | 2 | 2 | 1 | 0 |
| 289: | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| 297: | 2 | 0 | 0 | 1 | 2 | 2 | 2 | 2 |
| 305: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 313: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 329: | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 337: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 345: | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 3 |
| 353: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 361: | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 3 | 2 | 1 | 2 | 2 | 3 | 1 | 3 |

Sample Title: 01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 4 | 3 | 3 | 2 | 3 | 6 | 3 | 1 |
| 385: | 5 | 3 | 2 | 1 | 3 | 2 | 3 | 2 |
| 393: | 5 | 4 | 3 | 7 | 2 | 6 | 5 | 12 |
| 401: | 10 | 13 | 7 | 7 | 13 | 9 | 9 | 10 |
| 409: | 19 | 6 | 7 | 13 | 12 | 16 | 10 | 14 |
| 417: | 15 | 11 | 13 | 17 | 18 | 16 | 19 | 17 |
| 425: | 18 | 17 | 14 | 16 | 24 | 14 | 6 | 5 |
| 433: | 6 | 3 | 4 | 0 | 0 | 0 | 1 | 1 |
| 441: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 449: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 489: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 513: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 2 |
| 521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 545: | 1 | 1 | 0 | 3 | 1 | 0 | 1 | 0 |
| 553: | 0 | 2 | 1 | 1 | 2 | 2 | 0 | 2 |
| 561: | 2 | 4 | 0 | 0 | 3 | 2 | 4 | 4 |
| 569: | 1 | 1 | 1 | 4 | 0 | 4 | 3 | 4 |
| 577: | 4 | 7 | 6 | 6 | 4 | 6 | 5 | 5 |
| 585: | 8 | 9 | 10 | 11 | 8 | 7 | 5 | 7 |
| 593: | 5 | 5 | 10 | 12 | 9 | 9 | 17 | 12 |
| 601: | 11 | 9 | 14 | 17 | 19 | 14 | 14 | 13 |
| 609: | 12 | 17 | 10 | 16 | 11 | 3 | 3 | 3 |
| 617: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

KB 8/22/17

# Apex-Alpha™

Sample Description: BLANK
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 02
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_040
Chamber Serial Number: 06027396B
Detector Serial Number: 91135
Env. Background: System Bkgd 194214
Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 gram
Sample Date/Time: 8/22/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:14:57 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.610 mL
Effective Efficiency: 0.2139 +/- 0.0118
Counting Efficiency: 0.1813 +/- 0.0031 on 11/18/2016 10:08:48 AM
Chem. Recovery Factor: 1.1797 +/- 0.0678

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.276 | 402.98 | 9.78 | 1.02 | 0.00E+000 | 22.7 |
| U-234 | | 4.714 | 6.66 | 78.18 | 0.34 | 0.00E+000 | 3.0 |
| U-235 | | 4.396 | -0.34 | 592.90 | 0.34 | 0.00E+000 | 0.0 |
| U-238 | | 4.164 | 4.00 | 109.57 | 0.00 | 0.00E+000 | 3.0 |

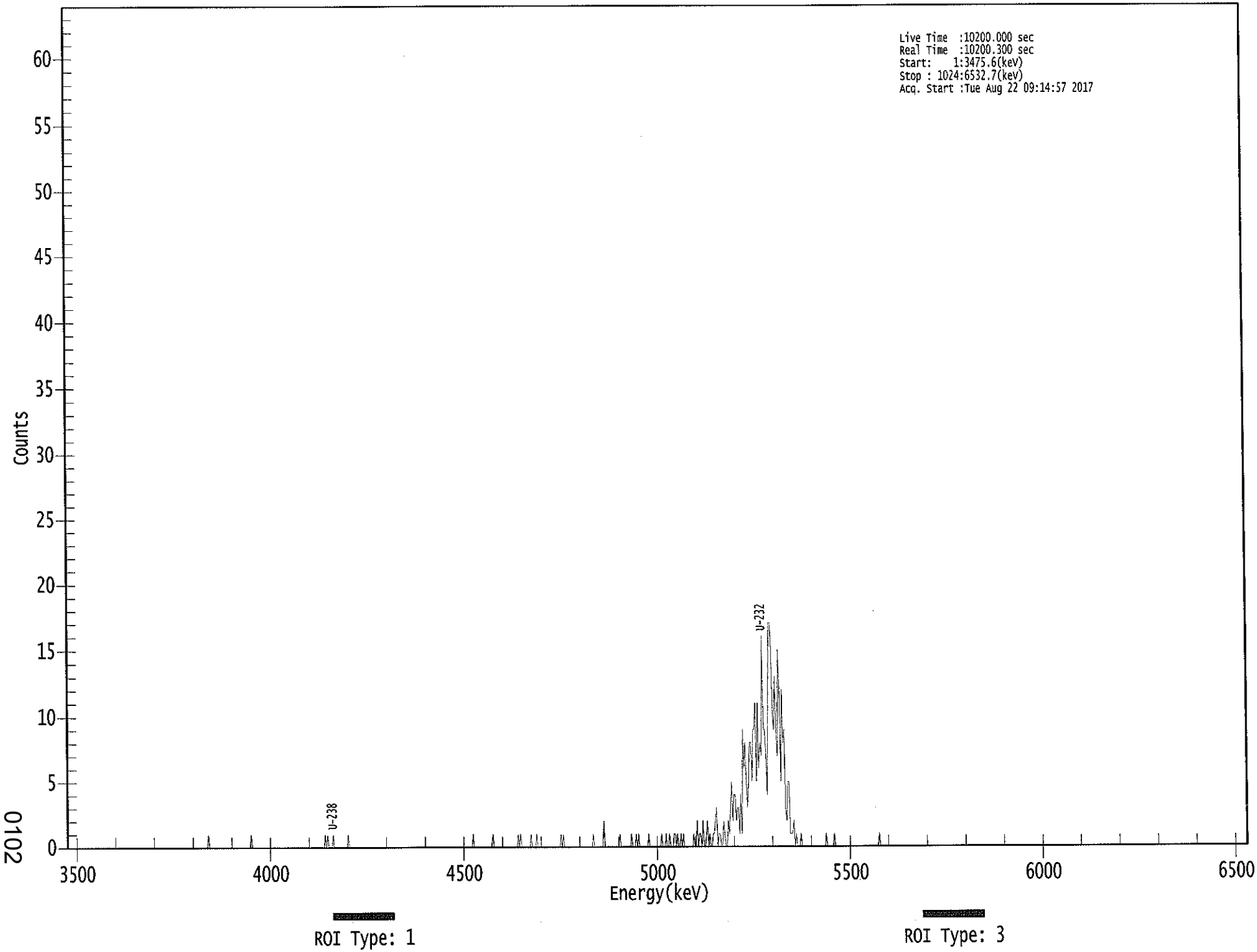
T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.995 | 5302.50* | 5.00E+000 +/- 5.39E-001 | 7.82E-002 +/- 8.42E-003 |
| U-234 | 0.984 | 4761.50* | 8.27E-002 +/- 6.52E-002 | 5.93E-002 +/- 6.39E-003 |
| U-235 | 0.999 | 4385.50* | -5.21E-003 +/- 3.09E-002 | 7.32E-002 +/- 7.88E-003 |
| U-238 | 0.997 | 4184.40* | 4.94E-002 +/- 5.44E-002 | 7.41E-002 +/- 7.98E-003 |

AG 8/23/17

0000192214.CNF




0102

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 02

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 225: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 02

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 393: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 401: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 425: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 449: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 521: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 529: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 545: | 0 | 2 | 0 | 1 | 1 | 0 | 2 | 0 |
| 553: | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 1 |
| 561: | 1 | 2 | 3 | 0 | 1 | 1 | 0 | 0 |
| 569: | 2 | 1 | 0 | 0 | 2 | 1 | 3 | 5 |
| 577: | 2 | 4 | 4 | 2 | 3 | 3 | 1 | 4 |
| 585: | 1 | 9 | 6 | 8 | 5 | 3 | 5 | 8 |
| 593: | 8 | 5 | 9 | 9 | 11 | 5 | 11 | 6 |
| 601: | 8 | 7 | 16 | 9 | 9 | 7 | 4 | 11 |
| 609: | 17 | 17 | 15 | 10 | 9 | 13 | 9 | 7 |
| 617: | 15 | 12 | 5 | 12 | 8 | 9 | 3 | 2 |
| 625: | 5 | 5 | 1 | 1 | 1 | 2 | 0 | 1 |
| 633: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 02

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

JCK 8/22/17

Sample Description: HTC-A03-S002-0006-01-DUP
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 03
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_043
Chamber Serial Number: 04026481A
Detector Serial Number: 91088
Env. Background: System Bkgd 194215
Reagent Blank: <not performed>

Sample Size: 1.100E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:14:58 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.609 mL
Effective Efficiency: 0.2361 +/- 0.0125
Counting Efficiency: 0.1874 +/- 0.0032 on 11/18/2016 10:08:43 AM
Chem. Recovery Factor: 1.2595 +/- 0.0699

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.275 | 444.30 | 9.32 | 1.70 | 0.00E+000 | 16.7 |
| U-234 | | 4.732 | 59.98 | 25.56 | 1.02 | 0.00E+000 | 6.0 |
| U-235 | | 4.396 | -0.68 | 304.44 | 0.68 | 0.00E+000 | 0.0 |
| U-238 | | 4.161 | 34.66 | 33.48 | 0.34 | 0.00E+000 | 4.0 |

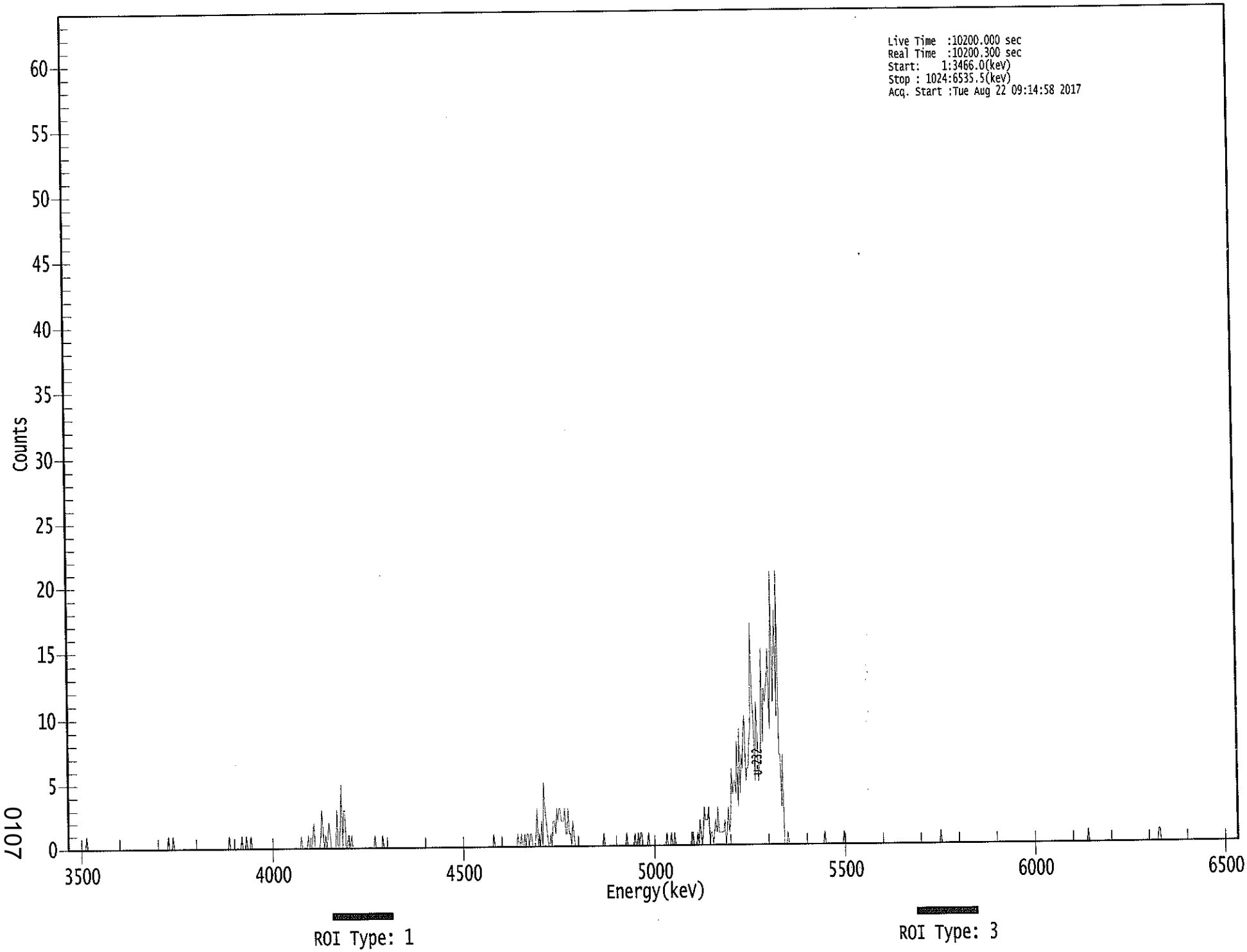
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.995 | 5302.50* | 4.55E+000 +/- 4.72E-001 | 7.53E-002 +/- 7.80E-003 |
| U-234 | 0.994 | 4761.50* | 6.13E-001 +/- 1.69E-001 | 6.44E-002 +/- 6.67E-003 |
| U-235 | 0.999 | 4385.50* | -8.58E-003 +/- 2.61E-002 | 7.11E-002 +/- 7.37E-003 |
| U-238 | 0.996 | 4184.40* | 3.53E-001 +/- 1.24E-001 | 4.87E-002 +/- 5.04E-003 |

AG 8/23/17

0000192222.CNF




0107

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 03

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 89: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 153: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 209: | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 |
| 217: | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 0 |
| 225: | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 0 |
| 233: | 0 | 0 | 3 | 0 | 0 | 2 | 5 | 0 |
| 241: | 3 | 3 | 0 | 0 | 1 | 1 | 0 | 1 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

Sample Title: 03

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 393: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 401: | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 409: | 1 | 3 | 0 | 1 | 0 | 2 | 0 | 5 |
| 417: | 3 | 2 | 1 | 0 | 0 | 1 | 0 | 2 |
| 425: | 2 | 1 | 3 | 2 | 3 | 3 | 2 | 2 |
| 433: | 2 | 3 | 1 | 1 | 3 | 1 | 1 | 0 |
| 441: | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 449: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 497: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 505: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 529: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 2 |
| 553: | 1 | 0 | 1 | 3 | 2 | 2 | 2 | 3 |
| 561: | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 3 |
| 569: | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 |
| 577: | 3 | 1 | 2 | 6 | 4 | 5 | 5 | 4 |
| 585: | 8 | 3 | 9 | 4 | 7 | 6 | 9 | 10 |
| 593: | 5 | 6 | 6 | 8 | 9 | 17 | 11 | 10 |
| 601: | 5 | 11 | 9 | 5 | 6 | 7 | 15 | 8 |
| 609: | 12 | 11 | 12 | 13 | 15 | 9 | 13 | 21 |
| 617: | 11 | 14 | 18 | 10 | 21 | 7 | 7 | 3 |
| 625: | 7 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 03

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

JCB 8/22/17

Sample Description: HTC-A03-S002-0006-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 04
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_044
Chamber Serial Number: 04026481B
Detector Serial Number: 84168
Env. Background: System Bkgd 194216
Reagent Blank: <not performed>

Sample Size: 1.090E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:00 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.609 mL
Effective Efficiency: 0.1813 +/- 0.0107
Counting Efficiency: 0.1793 +/- 0.0030 on 11/18/2016 10:08:42 AM
Chem. Recovery Factor: 1.0111 +/- 0.0620

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.277 | 340.83 | 10.62 | 0.17 | 0.00E+000 | 16.6 |
| U-234 | | 4.744 | 43.00 | 30.24 | 0.00 | 0.00E+000 | 5.3 |
| U-235 | | 4.368 | 3.00 | 130.67 | 0.00 | 0.00E+000 | 3.0 |
| U-238 | | 4.134 | 27.83 | 37.29 | 0.17 | 0.00E+000 | 3.8 |

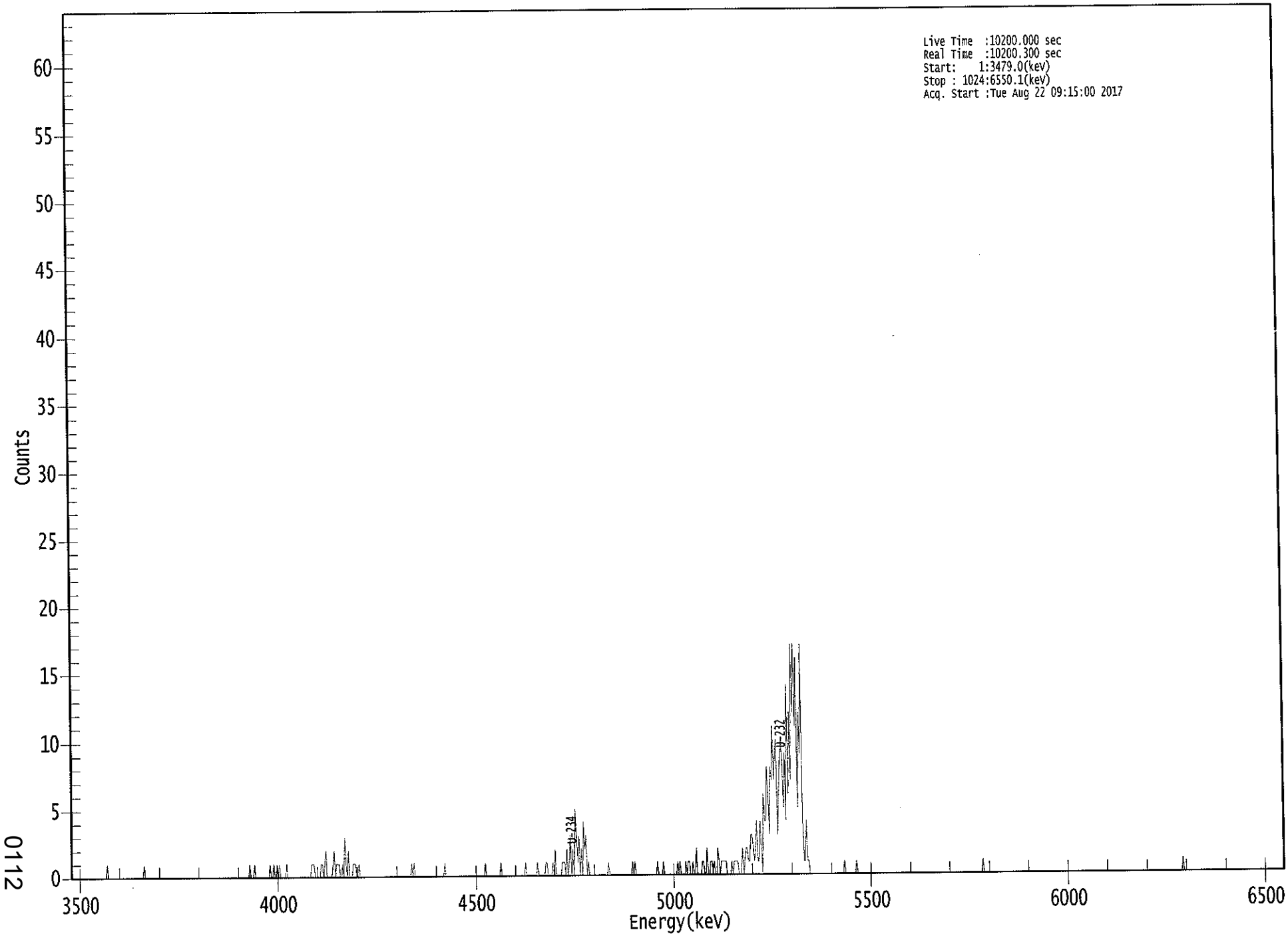
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.995 | 5302.50* | 4.59E+000 +/- 5.30E-001 | 5.62E-002 +/- 6.49E-003 |
| U-234 | 0.998 | 4761.50* | 5.78E-001 +/- 1.87E-001 | 8.06E-002 +/- 9.30E-003 |
| U-235 | 0.998 | 4385.50* | 4.97E-002 +/- 6.52E-002 | 9.94E-002 +/- 1.15E-002 |
| U-238 | 0.982 | 4184.40* | 3.72E-001 +/- 1.45E-001 | 5.58E-002 +/- 6.44E-003 |

AG 8/23/17

0000192223.CNF




0112

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 04

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 153: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 169: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 177: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 209: | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 0 |
| 217: | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 1 |
| 225: | 1 | 1 | 0 | 0 | 1 | 0 | 3 | 1 |
| 233: | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 |
| 241: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 289: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 04

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 393: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 401: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 409: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 417: | 0 | 2 | 0 | 1 | 3 | 0 | 2 | 0 |
| 425: | 5 | 3 | 1 | 3 | 0 | 2 | 0 | 4 |
| 433: | 2 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| 441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 449: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 497: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 513: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 521: | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| 529: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
| 537: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 545: | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 553: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 561: | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 1 |
| 569: | 2 | 2 | 1 | 1 | 3 | 3 | 2 | 1 |
| 577: | 2 | 4 | 1 | 1 | 4 | 2 | 0 | 6 |
| 585: | 4 | 4 | 8 | 6 | 3 | 8 | 7 | 11 |
| 593: | 7 | 9 | 10 | 3 | 6 | 8 | 10 | 9 |
| 601: | 5 | 9 | 4 | 14 | 6 | 12 | 7 | 17 |
| 609: | 12 | 17 | 11 | 16 | 5 | 12 | 9 | 17 |
| 617: | 4 | 1 | 1 | 4 | 1 | 1 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 04

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

KB 8/22/17

# Apex-Alpha™

Sample Description: HTC-A03-S002-0612-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 05
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_045
Chamber Serial Number: 04026482A
Detector Serial Number: 91131
Env. Background: System Bkgd 194217
Reagent Blank: <not performed>

Sample Size: 1.530E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:03 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.609 mL
Effective Efficiency: 0.2133 +/- 0.0117
Counting Efficiency: 0.1688 +/- 0.0029 on 11/18/2016 10:08:40 AM
Chem. Recovery Factor: 1.2639 +/- 0.0728

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.272 | 401.15 | 9.80 | 0.85 | 0.00E+000 | 7.9 |
| U-234 | | 4.722 | 42.98 | 30.31 | 1.02 | 0.00E+000 | 3.4 |
| U-235 | | 4.419 | 5.83 | 82.55 | 0.17 | 0.00E+000 | 3.0 |
| U-238 | | 4.160 | 42.49 | 30.28 | 0.51 | 0.00E+000 | 10.9 |

T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.994 | 5302.50* | 3.27E+000 +/- 3.53E-001 | 4.88E-002 +/- 5.27E-003 |
| U-234 | 0.989 | 4761.50* | 3.50E-001 +/- 1.12E-001 | 5.12E-002 +/- 5.53E-003 |
| U-235 | 0.992 | 4385.50* | 5.85E-002 +/- 4.87E-002 | 4.19E-002 +/- 4.52E-003 |
| U-238 | 0.996 | 4184.40* | 3.44E-001 +/- 1.11E-001 | 4.25E-002 +/- 4.58E-003 |

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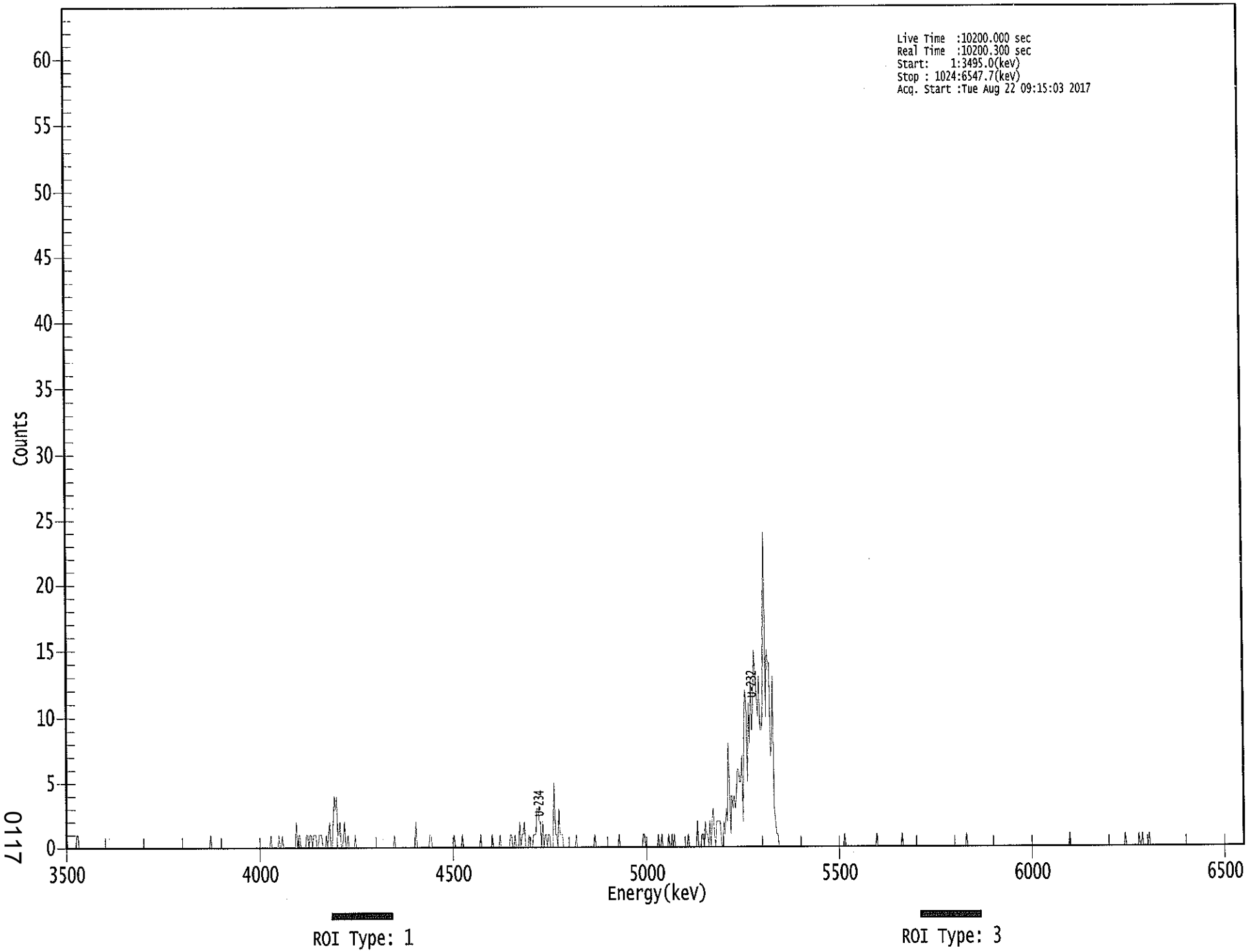
0000192206.CNF




0117

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 05

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1: | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 185: | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 201: | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 209: | 1 | 1 | 0 | 1 | 1 | 0 | 1 |
| 217: | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| 225: | 0 | 1 | 0 | 1 | 2 | 0 | 0 |
| 233: | 4 | 3 | 4 | 1 | 1 | 2 | 0 |
| 241: | 1 | 2 | 0 | 0 | 1 | 0 | 0 |
| 249: | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 05

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 393: | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 0 |
| 401: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 409: | 3 | 3 | 2 | 2 | 0 | 2 | 0 | 1 |
| 417: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 5 |
| 425: | 1 | 1 | 0 | 3 | 1 | 1 | 1 | 0 |
| 433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 441: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 449: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 457: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 521: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| 553: | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 0 |
| 561: | 2 | 3 | 1 | 0 | 2 | 2 | 2 | 2 |
| 569: | 0 | 0 | 2 | 1 | 3 | 2 | 8 | 5 |
| 577: | 1 | 4 | 3 | 4 | 3 | 4 | 6 | 6 |
| 585: | 5 | 5 | 7 | 2 | 9 | 12 | 11 | 5 |
| 593: | 11 | 8 | 13 | 9 | 11 | 15 | 13 | 12 |
| 601: | 10 | 13 | 9 | 9 | 10 | 19 | 24 | 10 |
| 609: | 15 | 14 | 14 | 7 | 8 | 13 | 3 | 2 |
| 617: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 05

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 937: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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# Apex-Alpha™

Sample Description: HTC-A03-S002-1218-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 06
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_046
Chamber Serial Number: 04026482B
Detector Serial Number: 58762
Env. Background: System Bkgd 194218
Reagent Blank: <not performed>

Sample Size: 1.290E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:06 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.606 mL
Effective Efficiency: 0.2156 +/- 0.0118
Counting Efficiency: 0.1713 +/- 0.0029 on 11/18/2016 10:08:38 AM
Chem. Recovery Factor: 1.2582 +/- 0.0723

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.284 | 403.98 | 9.77 | 1.02 | 0.00E+000 | 4.7 |
| U-234 | | 4.733 | 111.81 | 18.65 | 1.19 | 0.00E+000 | 10.5 |
| U-235 | | 4.392 | 3.66 | 107.87 | 0.34 | 0.00E+000 | 3.0 |
| U-238 | | 4.161 | 81.49 | 21.79 | 0.51 | 0.00E+000 | 4.0 |

T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.998 | 5302.50* | 3.87E+000 +/- 4.16E-001 | 6.03E-002 +/- 6.49E-003 |
| U-234 | 0.994 | 4761.50* | 1.07E+000 +/- 2.30E-001 | 6.29E-002 +/- 6.77E-003 |
| U-235 | 1.000 | 4385.50* | 4.31E-002 +/- 4.67E-002 | 5.63E-002 +/- 6.06E-003 |
| U-238 | 0.996 | 4184.40* | 7.75E-001 +/- 1.88E-001 | 4.99E-002 +/- 5.37E-003 |

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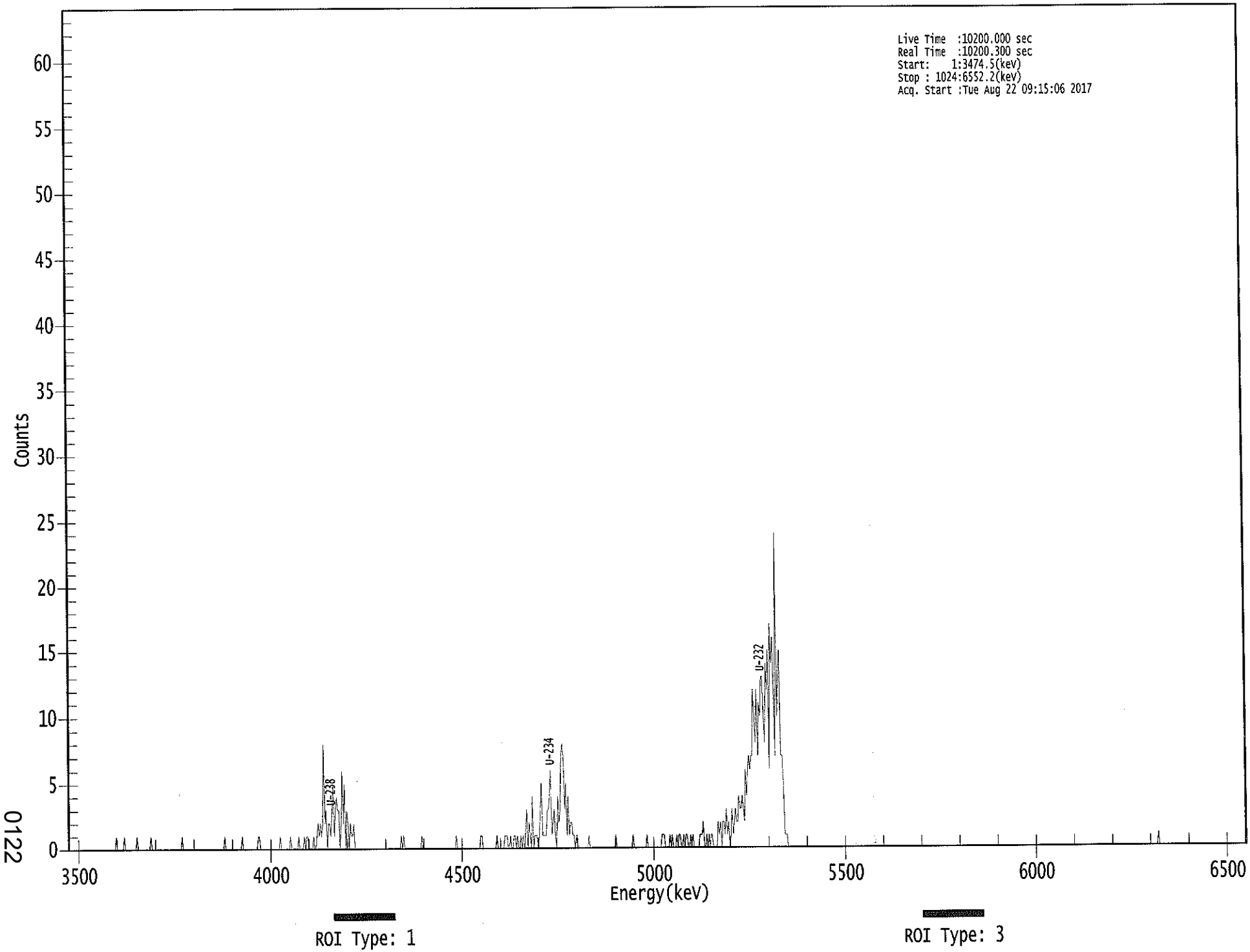
0000192207.CNF




0122

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 06

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 201: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 209: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 217: | 2 | 1 | 2 | 1 | 2 | 8 | 2 | 3 |
| 225: | 0 | 2 | 2 | 1 | 3 | 5 | 1 | 3 |
| 233: | 4 | 3 | 3 | 0 | 2 | 6 | 2 | 5 |
| 241: | 0 | 3 | 2 | 0 | 2 | 1 | 1 | 2 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

Sample Title: 06

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| 385: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 393: | 1 | 0 | 1 | 0 | 1 | 3 | 0 | 2 |
| 401: | 1 | 0 | 4 | 0 | 1 | 1 | 1 | 0 |
| 409: | 1 | 3 | 5 | 1 | 1 | 1 | 1 | 3 |
| 417: | 3 | 4 | 6 | 1 | 2 | 3 | 1 | 0 |
| 425: | 4 | 2 | 3 | 7 | 8 | 7 | 3 | 5 |
| 433: | 1 | 4 | 1 | 2 | 2 | 1 | 1 | 0 |
| 441: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 449: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 521: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 529: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 537: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 545: | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 |
| 553: | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 561: | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 2 |
| 569: | 2 | 1 | 3 | 1 | 2 | 0 | 1 | 3 |
| 577: | 1 | 2 | 3 | 2 | 2 | 4 | 3 | 3 |
| 585: | 4 | 3 | 2 | 6 | 4 | 6 | 7 | 6 |
| 593: | 7 | 7 | 12 | 10 | 8 | 12 | 7 | 11 |
| 601: | 10 | 13 | 13 | 10 | 8 | 14 | 12 | 15 |
| 609: | 6 | 17 | 14 | 16 | 12 | 7 | 24 | 10 |
| 617: | 13 | 15 | 7 | 7 | 5 | 1 | 1 | 1 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 06

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KB 8/22/17

Sample Description: HTC-A03-S002-1824-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 07
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_047
Chamber Serial Number: 02030596A
Detector Serial Number: 91086
Env. Background: System Bkgd 194219
Reagent Blank: <not performed>

Sample Size: 1.030E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:08 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.608 mL
Effective Efficiency: 0.1330 +/- 0.0090
Counting Efficiency: 0.1623 +/- 0.0028 on 11/18/2016 10:08:37 AM
Chem. Recovery Factor: 0.8198 +/- 0.0570

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.275 | 250.00 | 12.42 | 0.00 | 0.00E+000 | 20.4 |
| U-234 | | 4.723 | 34.83 | 33.31 | 0.17 | 0.00E+000 | 3.7 |
| U-235 | | 4.379 | 2.66 | 128.85 | 0.34 | 0.00E+000 | 3.0 |
| U-238 | | 4.155 | 29.66 | 36.23 | 0.34 | 0.00E+000 | 3.7 |

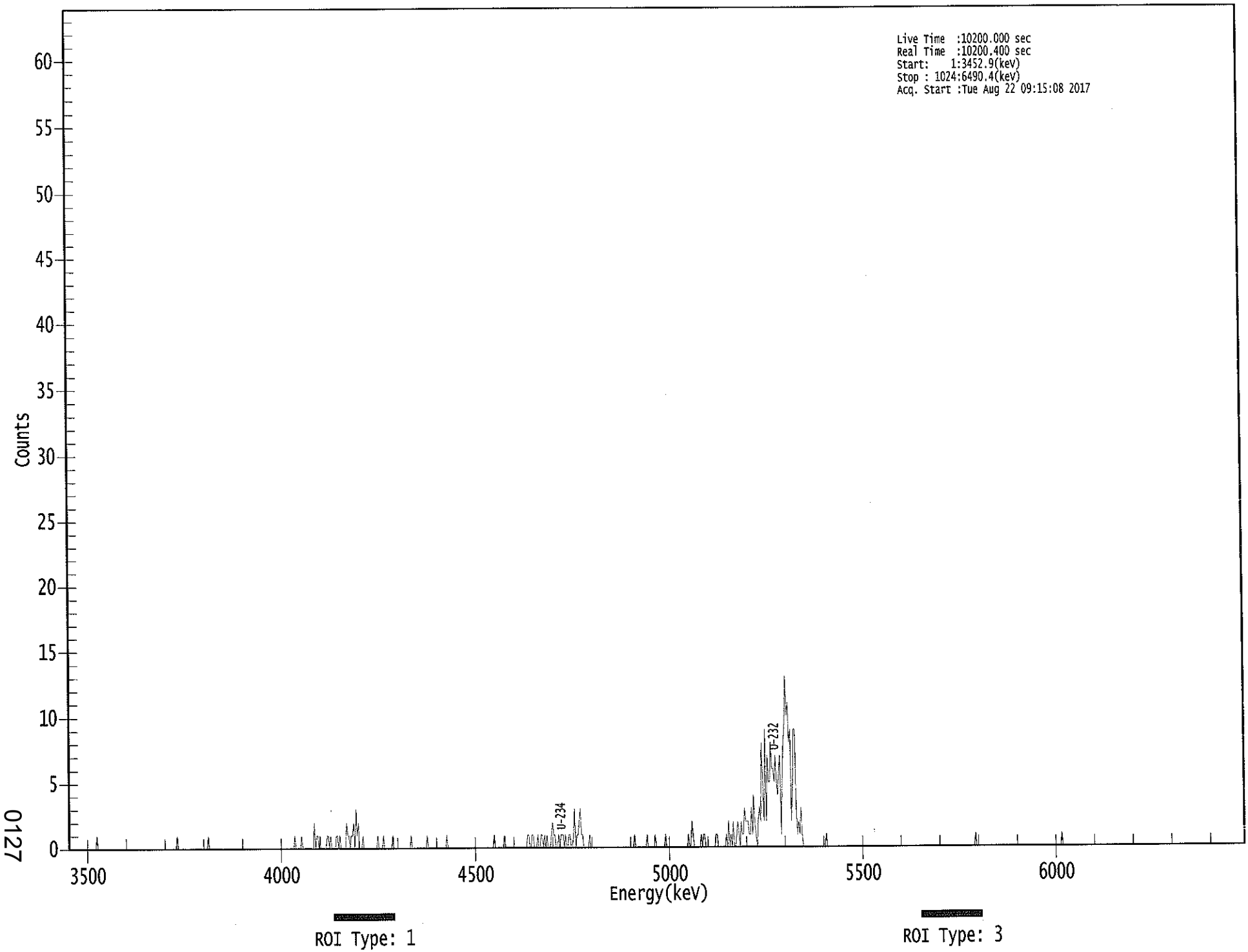
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.994 | 5302.50* | 4.86E+000 +/- 6.42E-001 | 1.16E-001 +/- 1.54E-002 |
| U-234 | 0.989 | 4761.50* | 6.75E-001 +/- 2.42E-001 | 8.09E-002 +/- 1.07E-002 |
| U-235 | 1.000 | 4385.50* | 6.36E-002 +/- 8.24E-002 | 1.14E-001 +/- 1.51E-002 |
| U-238 | 0.994 | 4184.40* | 5.72E-001 +/- 2.21E-001 | 9.22E-002 +/- 1.22E-002 |

AG
8/23/17

0000192215.CNF




0127

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 07

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 201: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |
| 217: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 225: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 233: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 241: | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 2 |
| 249: | 0 | 3 | 1 | 2 | 0 | 0 | 0 | 1 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 273: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 07

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 393: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 401: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 409: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 417: | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 0 |
| 425: | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 433: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 3 |
| 441: | 0 | 1 | 1 | 2 | 3 | 1 | 1 | 0 |
| 449: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 553: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 |
| 577: | 0 | 2 | 0 | 0 | 1 | 2 | 1 | 0 |
| 585: | 2 | 1 | 1 | 3 | 2 | 2 | 2 | 1 |
| 593: | 1 | 3 | 1 | 4 | 2 | 1 | 0 | 2 |
| 601: | 3 | 2 | 8 | 5 | 2 | 9 | 2 | 7 |
| 609: | 5 | 5 | 8 | 6 | 6 | 5 | 7 | 5 |
| 617: | 4 | 6 | 7 | 1 | 5 | 8 | 9 | 13 |
| 625: | 10 | 11 | 8 | 9 | 2 | 5 | 9 | 9 |
| 633: | 3 | 1 | 2 | 1 | 3 | 1 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 07

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

XB 8/22/17

Apex-Alpha™

Sample Description: HTC-A03-S002-2430-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 08
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_048
Chamber Serial Number: 02030596B
Detector Serial Number: 83111
Env. Background: System Bkgd 194220
Reagent Blank: <not performed>

Sample Size: 1.250E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:11 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.607 mL
Effective Efficiency: 0.2001 +/- 0.0113
Counting Efficiency: 0.1633 +/- 0.0028 on 11/18/2016 10:08:35 AM
Chem. Recovery Factor: 1.2248 +/- 0.0724

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.292 | 375.32 | 10.13 | 0.68 | 0.00E+000 | 25.2 |
| U-234 | | 4.741 | 114.32 | 18.40 | 0.68 | 0.00E+000 | 5.2 |
| U-235 | | 4.399 | -0.51 | 400.63 | 0.51 | 0.00E+000 | 0.0 |
| U-238 | | 4.161 | 101.83 | 19.44 | 0.17 | 0.00E+000 | 4.1 |

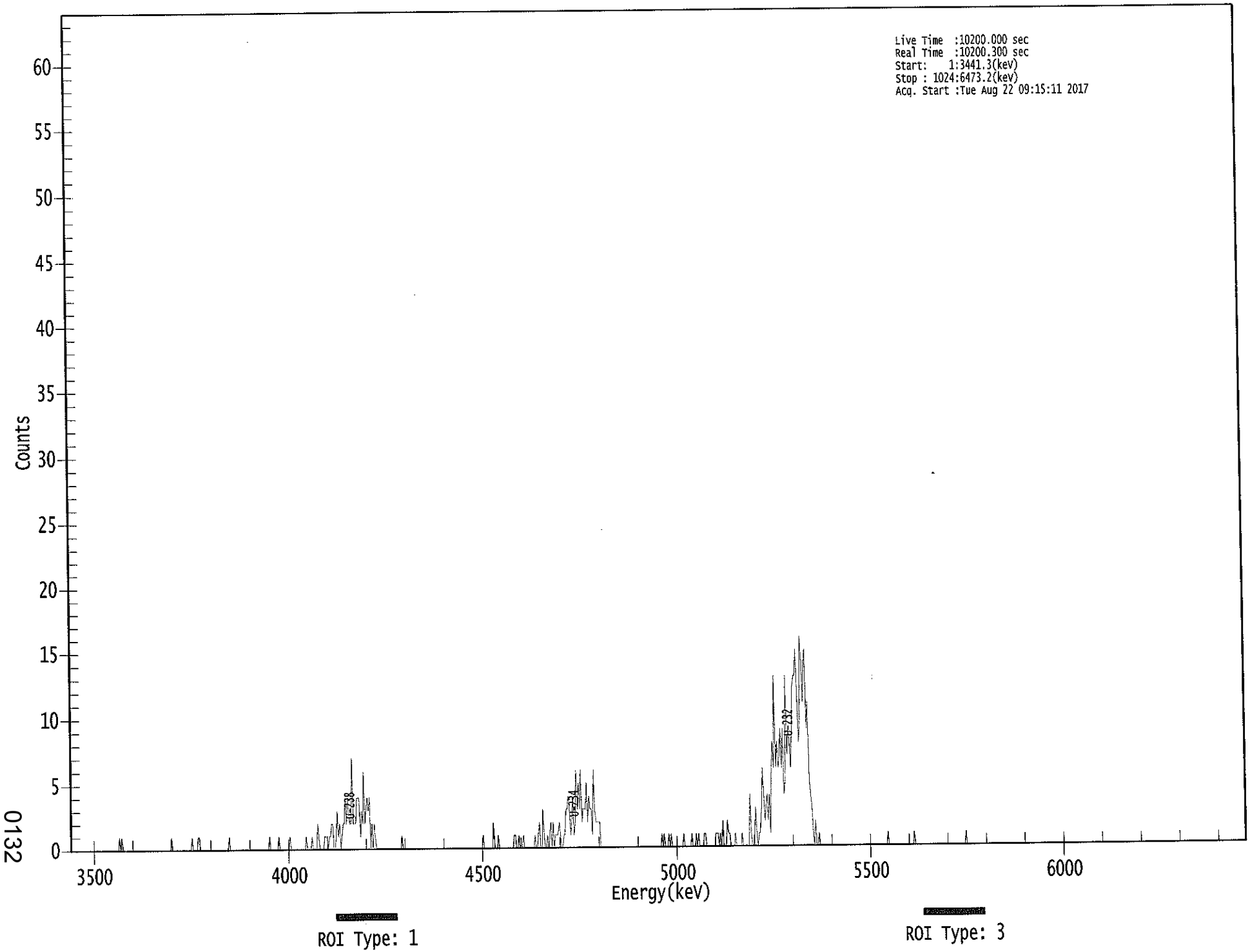
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.999 | 5302.50* | 4.00E+000 +/- 4.43E-001 | 6.01E-002 +/- 6.66E-003 |
| U-234 | 0.997 | 4761.50* | 1.21E+000 +/- 2.61E-001 | 5.99E-002 +/- 6.64E-003 |
| U-235 | 0.999 | 4385.50* | -6.68E-003 +/- 2.68E-002 | 6.87E-002 +/- 7.62E-003 |
| U-238 | 0.996 | 4184.40* | 1.08E+000 +/- 2.41E-001 | 4.41E-002 +/- 4.89E-003 |

AG 8/23/17

0000192216.CNF




0132

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 08

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 209: | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 |
| 217: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 225: | 1 | 1 | 2 | 2 | 0 | 0 | 1 | 3 |
| 233: | 1 | 2 | 0 | 1 | 2 | 2 | 4 | 2 |
| 241: | 4 | 3 | 2 | 2 | 7 | 2 | 2 | 2 |
| 249: | 4 | 4 | 4 | 1 | 3 | 2 | 6 | 2 |
| 257: | 3 | 4 | 3 | 4 | 0 | 2 | 0 | 2 |
| 265: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

Sample Title: 08

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 393: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 401: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 |
| 409: | 0 | 0 | 3 | 1 | 0 | 0 | 1 | 0 |
| 417: | 1 | 2 | 0 | 2 | 0 | 1 | 1 | 1 |
| 425: | 2 | 1 | 0 | 0 | 1 | 1 | 3 | 3 |
| 433: | 4 | 3 | 1 | 2 | 4 | 1 | 2 | 6 |
| 441: | 3 | 5 | 3 | 6 | 2 | 3 | 3 | 3 |
| 449: | 5 | 2 | 4 | 3 | 3 | 1 | 6 | 3 |
| 457: | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 521: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 545: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 1 | 1 | 1 | 0 | 1 | 0 | 2 | 0 |
| 569: | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| 577: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 |
| 593: | 0 | 0 | 1 | 3 | 1 | 0 | 1 | 1 |
| 601: | 3 | 6 | 4 | 2 | 3 | 4 | 2 | 4 |
| 609: | 1 | 6 | 8 | 6 | 13 | 6 | 8 | 6 |
| 617: | 7 | 9 | 6 | 9 | 4 | 5 | 13 | 7 |
| 625: | 9 | 8 | 6 | 9 | 12 | 13 | 13 | 15 |
| 633: | 12 | 8 | 9 | 16 | 14 | 11 | 14 | 15 |
| 641: | 9 | 11 | 5 | 4 | 3 | 1 | 0 | 2 |
| 649: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 08

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

VB 8/22/17

# Apex-Alpha™

Sample Description: HTC-A03-S002-3036-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 09
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_049
Chamber Serial Number: 10006121A
Detector Serial Number: 49
Env. Background: System Bkgd 194221
Reagent Blank: <not performed>

Sample Size: 1.006E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:13 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.609 mL
Effective Efficiency: 0.1718 +/- 0.0104
Counting Efficiency: 0.1488 +/- 0.0026 on 11/18/2016 3:34:20 PM
Chem. Recovery Factor: 1.1542 +/- 0.0724

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.272 | 323.32 | 10.91 | 0.68 | 0.00E+000 | 26.6 |
| U-234 | | 4.729 | 37.66 | 32.11 | 0.34 | 0.00E+000 | 4.4 |
| U-235 | | 4.327 | 0.15 | 1397.8 | 0.85 | 0.00E+000 | 3.0 |
| U-238 | | 4.170 | 19.32 | 45.50 | 0.68 | 0.00E+000 | 4.4 |

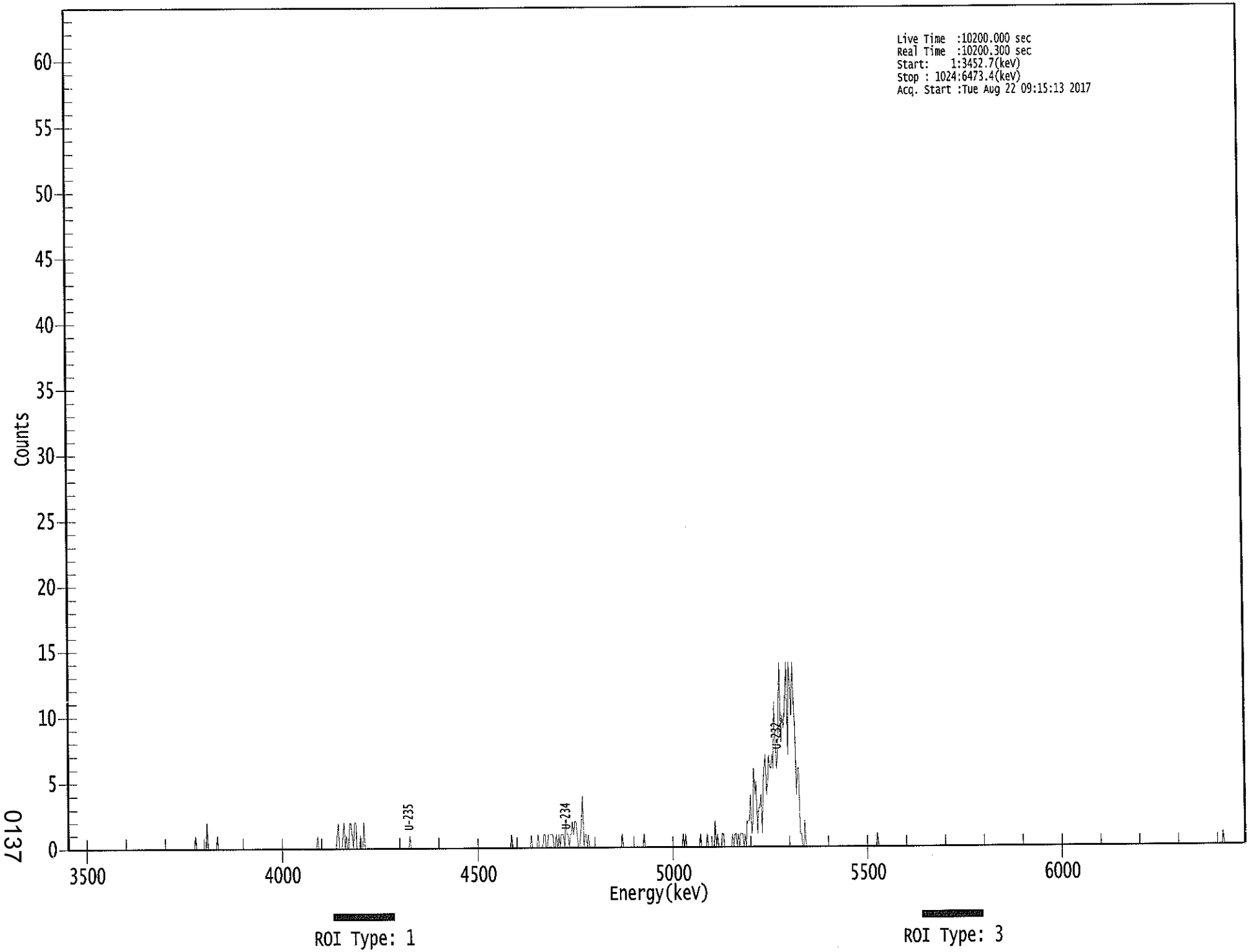
T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.993 | 5302.50* | 4.98E+000 +/- 5.88E-001 | 8.69E-002 +/- 1.03E-002 |
| U-234 | 0.993 | 4761.50* | 5.79E-001 +/- 1.98E-001 | 7.34E-002 +/- 8.67E-003 |
| U-235 | 0.976 | 4385.50* | 2.84E-003 +/- 3.97E-002 | 1.13E-001 +/- 1.34E-002 |
| U-238 | 0.998 | 4184.40* | 2.96E-001 +/- 1.39E-001 | 8.63E-002 +/- 1.02E-002 |

AG 8/23/17

0000192217.CNF



**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 09

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 |
| 241: | 0 | 1 | 0 | 0 | 2 | 2 | 1 | 0 |
| 249: | 2 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| 257: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 09

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 401: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 409: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 417: | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 425: | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 2 |
| 433: | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 2 |
| 441: | 2 | 1 | 0 | 0 | 1 | 2 | 4 | 0 |
| 449: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 553: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| 569: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 585: | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 2 |
| 593: | 4 | 1 | 2 | 6 | 4 | 5 | 1 | 3 |
| 601: | 3 | 4 | 1 | 5 | 6 | 7 | 4 | 5 |
| 609: | 7 | 6 | 6 | 7 | 6 | 11 | 8 | 6 |
| 617: | 7 | 11 | 14 | 8 | 10 | 9 | 10 | 12 |
| 625: | 14 | 7 | 14 | 12 | 10 | 14 | 11 | 9 |
| 633: | 4 | 6 | 6 | 1 | 1 | 0 | 0 | 2 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 09

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

NB 8/22/17

Sample Description: HTC-A03-S002-3036-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 10
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_050
Chamber Serial Number: 10006121B
Detector Serial Number: 50
Env. Background: System Bkgd 194222
Reagent Blank: <not performed>

Sample Size: 1.005E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:16 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.609 mL
Effective Efficiency: 0.1662 +/- 0.0102
Counting Efficiency: 0.1433 +/- 0.0025 on 11/18/2016 3:34:18 PM
Chem. Recovery Factor: 1.1599 +/- 0.0739

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.283 | 312.45 | 11.14 | 2.55 | 0.00E+000 | 9.7 |
| U-234 | | 4.735 | 412.64 | 9.67 | 1.36 | 0.00E+000 | 11.8 |
| U-235 | | 4.402 | 25.49 | 39.27 | 0.51 | 0.00E+000 | 3.7 |
| U-238 | | 4.162 | 453.47 | 9.22 | 1.53 | 0.00E+000 | 19.3 |

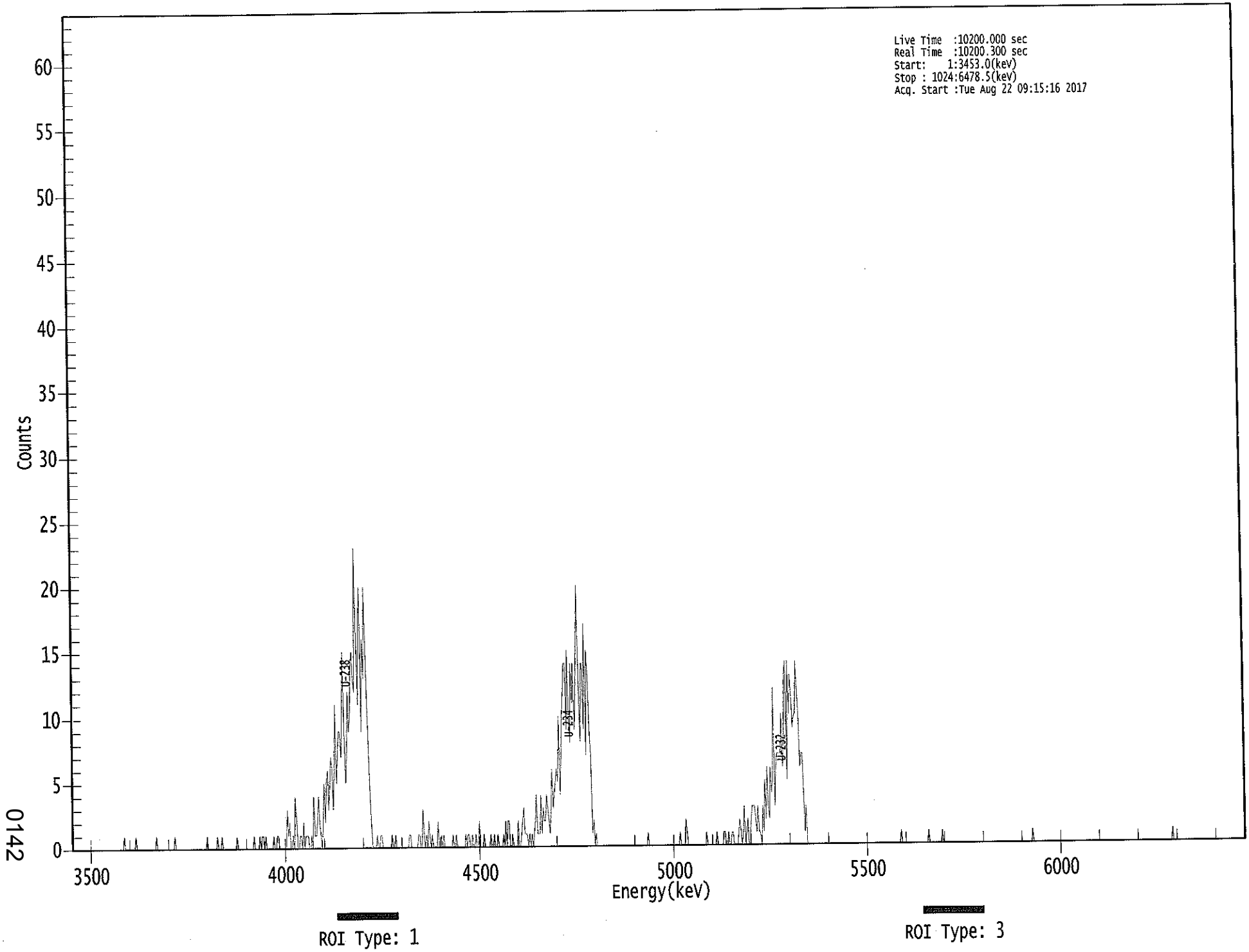
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.997 | 5302.50* | 4.98E+000 +/- 5.99E-001 | 1.34E-001 +/- 1.61E-002 |
| U-234 | 0.995 | 4761.50* | 6.56E+000 +/- 1.01E+000 | 1.09E-001 +/- 1.31E-002 |
| U-235 | 0.998 | 4385.50* | 5.00E-001 +/- 2.05E-001 | 1.03E-001 +/- 1.24E-002 |
| U-238 | 0.997 | 4184.40* | 7.18E+000 +/- 1.09E+000 | 1.13E-001 +/- 1.35E-002 |

AG 8/23/17

0000192208.CNF




0142

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 10

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 129: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 161: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 169: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 177: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 3 | 1 | 2 | 0 | 0 |
| 193: | 1 | 0 | 4 | 2 | 0 | 0 | 1 | 1 |
| 201: | 0 | 2 | 0 | 1 | 1 | 1 | 0 | 0 |
| 209: | 1 | 0 | 4 | 1 | 1 | 2 | 4 | 2 |
| 217: | 1 | 0 | 2 | 5 | 2 | 5 | 6 | 3 |
| 225: | 5 | 7 | 6 | 3 | 6 | 11 | 5 | 7 |
| 233: | 9 | 9 | 7 | 10 | 15 | 9 | 5 | 7 |
| 241: | 12 | 9 | 10 | 14 | 15 | 13 | 12 | 23 |
| 249: | 17 | 11 | 17 | 20 | 9 | 16 | 13 | 20 |
| 257: | 16 | 11 | 8 | 4 | 2 | 0 | 0 | 0 |
| 265: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 281: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 305: | 0 | 3 | 1 | 0 | 1 | 0 | 2 | 1 |
| 313: | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 |
| 321: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 345: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 353: | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 361: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |

Sample Title: 10

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 1 |
| 385: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 393: | 2 | 3 | 1 | 1 | 1 | 0 | 1 | 0 |
| 401: | 1 | 0 | 1 | 2 | 4 | 1 | 1 | 1 |
| 409: | 4 | 1 | 3 | 2 | 2 | 4 | 3 | 2 |
| 417: | 1 | 3 | 6 | 3 | 4 | 5 | 6 | 5 |
| 425: | 10 | 4 | 7 | 10 | 12 | 14 | 14 | 9 |
| 433: | 15 | 10 | 8 | 14 | 11 | 14 | 9 | 11 |
| 441: | 16 | 20 | 12 | 8 | 14 | 14 | 9 | 17 |
| 449: | 7 | 15 | 13 | 9 | 7 | 1 | 2 | 0 |
| 457: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 1 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 569: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 577: | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 |
| 585: | 1 | 3 | 0 | 1 | 2 | 0 | 0 | 2 |
| 593: | 3 | 3 | 3 | 2 | 1 | 3 | 1 | 1 |
| 601: | 0 | 3 | 1 | 5 | 2 | 6 | 3 | 2 |
| 609: | 6 | 4 | 5 | 12 | 3 | 6 | 7 | 7 |
| 617: | 7 | 7 | 10 | 6 | 8 | 13 | 14 | 5 |
| 625: | 14 | 10 | 13 | 11 | 9 | 10 | 10 | 14 |
| 633: | 12 | 10 | 6 | 7 | 7 | 4 | 1 | 3 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 10

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

KB 8/22/17

Apex-Alpha™

Sample Description: HTC-A03-S002-3036-01 MSD
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 11
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_052
Chamber Serial Number: 10006123B
Detector Serial Number: 52
Env. Background: System Bkgd 194223
Reagent Blank: <not performed>

Sample Size: 1.007E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:19 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.607 mL
Effective Efficiency: 0.1876 +/- 0.0109
Counting Efficiency: 0.1737 +/- 0.0030 on 11/18/2016 3:34:15 PM
Chem. Recovery Factor: 1.0796 +/- 0.0654

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.251 | 352.00 | 10.46 | 0.00 | 0.00E+000 | 4.8 |
| U-234 | | 4.712 | 489.15 | 8.87 | 0.85 | 0.00E+000 | 27.3 |
| U-235 | | 4.394 | 24.49 | 40.09 | 0.51 | 0.00E+000 | 3.7 |
| U-238 | | 4.135 | 463.66 | 9.11 | 0.34 | 0.00E+000 | 25.5 |

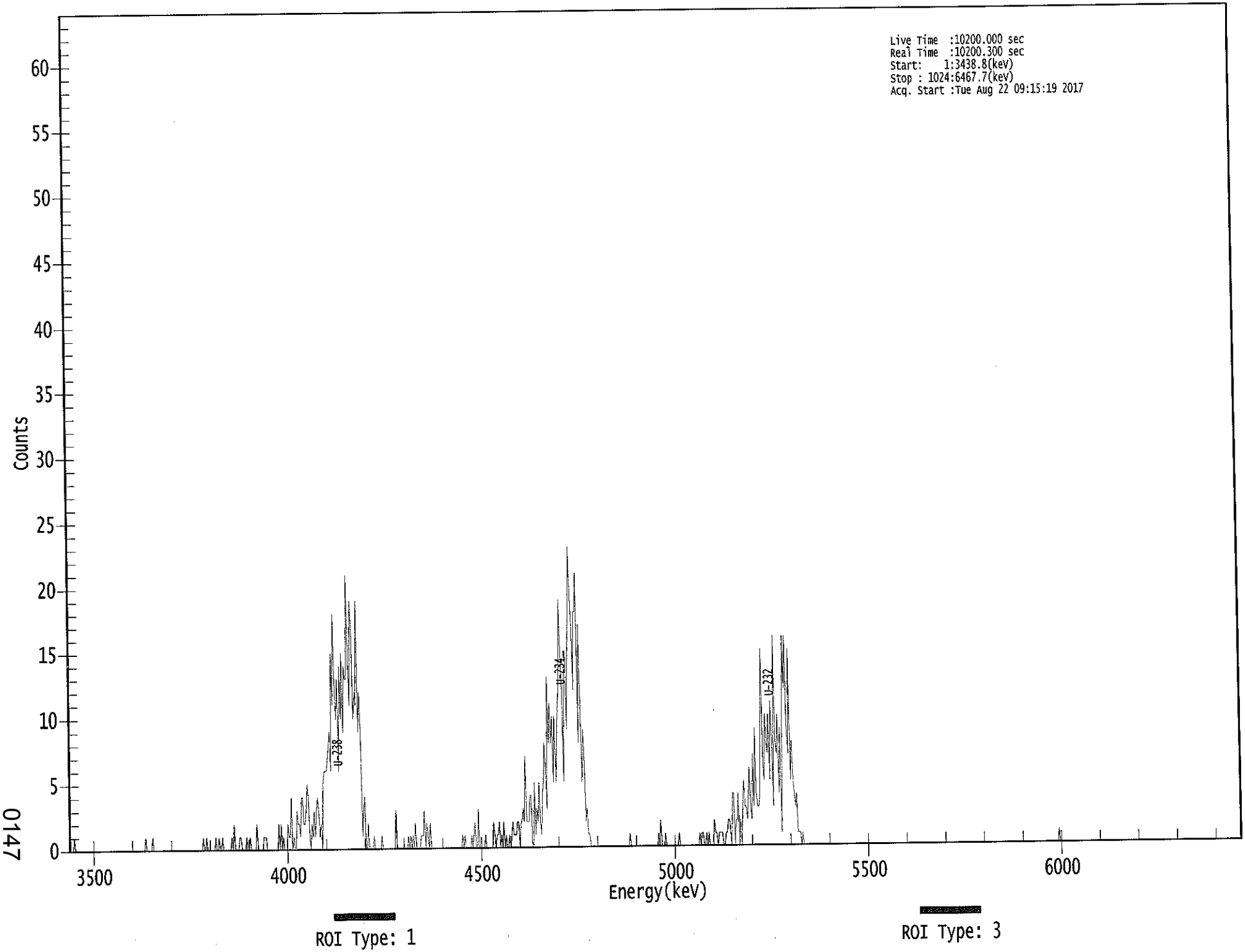
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.981 | 5302.50* | 4.96E+000 +/- 5.65E-001 | 8.45E-002 +/- 9.63E-003 |
| U-234 | 0.983 | 4761.50* | 6.88E+000 +/- 9.93E-001 | 8.42E-002 +/- 9.59E-003 |
| U-235 | 0.999 | 4385.50* | 4.25E-001 +/- 1.77E-001 | 9.10E-002 +/- 1.04E-002 |
| U-238 | 0.983 | 4184.40* | 6.49E+000 +/- 9.47E-001 | 6.69E-002 +/- 7.62E-003 |

AG
8/23/17

0000192209.CNF




0147

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 11

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 73: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 129: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 145: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 153: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 161: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 169: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 185: | 2 | 0 | 1 | 0 | 0 | 0 | 2 | 1 |
| 193: | 1 | 4 | 0 | 1 | 0 | 0 | 3 | 2 |
| 201: | 2 | 1 | 4 | 4 | 2 | 2 | 3 | 5 |
| 209: | 4 | 1 | 0 | 2 | 1 | 3 | 1 | 3 |
| 217: | 4 | 3 | 1 | 2 | 0 | 5 | 6 | 6 |
| 225: | 6 | 7 | 8 | 9 | 6 | 15 | 11 | 18 |
| 233: | 12 | 10 | 13 | 6 | 14 | 10 | 15 | 9 |
| 241: | 14 | 13 | 13 | 21 | 14 | 11 | 19 | 17 |
| 249: | 10 | 12 | 11 | 19 | 9 | 12 | 9 | 1 |
| 257: | 3 | 4 | 0 | 0 | 2 | 0 | 0 | 0 |
| 265: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 297: | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 |
| 305: | 0 | 0 | 1 | 1 | 1 | 3 | 0 | 2 |
| 313: | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 345: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 353: | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 |
| 361: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 2 | 1 | 0 | 1 | 1 | 2 | 0 |

Sample Title: 11

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 |
| 385: | 0 | 1 | 2 | 1 | 1 | 1 | 2 | 2 |
| 393: | 0 | 2 | 2 | 3 | 2 | 7 | 2 | 2 |
| 401: | 2 | 4 | 4 | 0 | 0 | 5 | 1 | 3 |
| 409: | 2 | 5 | 2 | 1 | 4 | 5 | 8 | 6 |
| 417: | 3 | 13 | 8 | 11 | 8 | 10 | 5 | 10 |
| 425: | 5 | 8 | 11 | 12 | 19 | 15 | 12 | 5 |
| 433: | 15 | 15 | 9 | 14 | 18 | 23 | 19 | 17 |
| 441: | 12 | 18 | 18 | 21 | 8 | 17 | 11 | 5 |
| 449: | 9 | 7 | 2 | 3 | 1 | 1 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 |
| 521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 553: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 561: | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 1 |
| 569: | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 2 |
| 577: | 1 | 0 | 4 | 4 | 0 | 2 | 2 | 4 |
| 585: | 0 | 2 | 0 | 3 | 5 | 3 | 3 | 2 |
| 593: | 4 | 6 | 3 | 2 | 7 | 3 | 9 | 4 |
| 601: | 3 | 3 | 4 | 10 | 15 | 6 | 5 | 10 |
| 609: | 8 | 7 | 10 | 5 | 11 | 8 | 3 | 16 |
| 617: | 8 | 7 | 10 | 4 | 9 | 1 | 9 | 16 |
| 625: | 12 | 16 | 9 | 7 | 15 | 5 | 8 | 5 |
| 633: | 4 | 3 | 4 | 1 | 1 | 1 | 0 | 1 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 11

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NB 8/22/17

# Apex-Alpha™

Sample Description: HTC-A03-S002-3036-02
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 12
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_053
Chamber Serial Number: 10006122A
Detector Serial Number: 53
Env. Background: System Bkgd 194224
Reagent Blank: <not performed>

Sample Size: 1.060E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:22 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.609 mL
Effective Efficiency: 0.1728 +/- 0.0104
Counting Efficiency: 0.1515 +/- 0.0026 on 11/18/2016 3:34:14 PM
Chem. Recovery Factor: 1.1408 +/- 0.0713

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.318 | 325.32 | 10.88 | 0.68 | 0.00E+000 | 10.4 |
| U-234 | | 4.755 | 47.66 | 28.51 | 0.34 | 0.00E+000 | 3.5 |
| U-235 | | 4.339 | 0.83 | 239.53 | 0.17 | 0.00E+000 | 3.0 |
| U-238 | | 4.189 | 51.00 | 27.71 | 0.00 | 0.00E+000 | 4.3 |

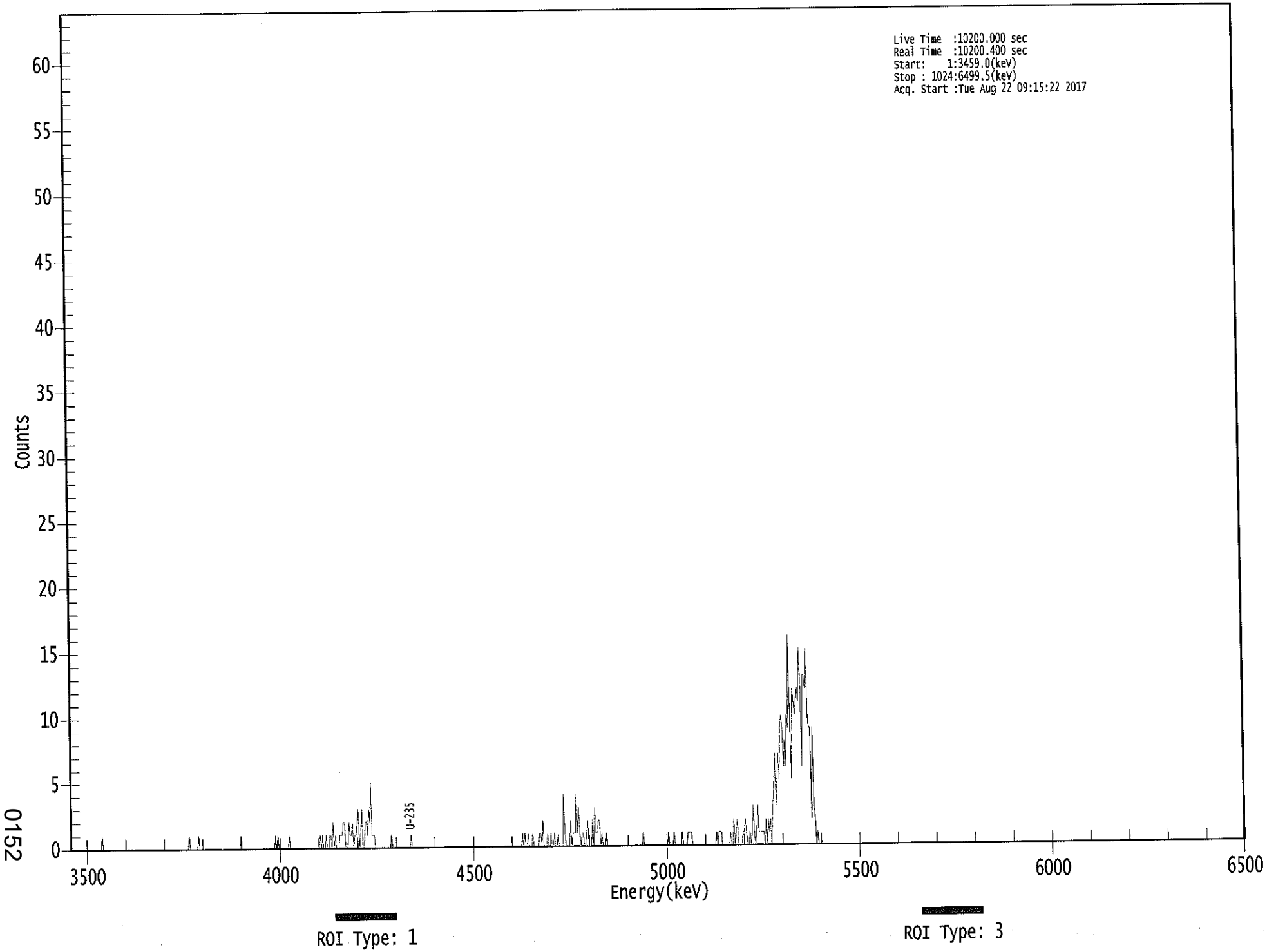
T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.998 | 5302.50* | 4.73E+000 +/- 5.57E-001 | 8.20E-002 +/- 9.66E-003 |
| U-234 | 1.000 | 4761.50* | 6.91E-001 +/- 2.13E-001 | 6.93E-002 +/- 8.16E-003 |
| U-235 | 0.985 | 4385.50* | 1.48E-002 +/- 3.56E-002 | 7.46E-002 +/- 8.79E-003 |
| U-238 | 1.000 | 4184.40* | 7.36E-001 +/- 2.22E-001 | 8.65E-002 +/- 1.02E-002 |

AG 8/23/17

0000192218.CNF




0152

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 12

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 225: | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 0 |
| 233: | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 0 |
| 241: | 0 | 0 | 2 | 1 | 1 | 2 | 0 | 1 |
| 249: | 1 | 2 | 3 | 0 | 1 | 3 | 0 | 0 |
| 257: | 2 | 2 | 1 | 3 | 2 | 5 | 1 | 1 |
| 265: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 12

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 393: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 401: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 409: | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 1 |
| 417: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 425: | 1 | 0 | 0 | 0 | 0 | 4 | 1 | 0 |
| 433: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 1 |
| 441: | 4 | 1 | 3 | 1 | 0 | 1 | 1 | 0 |
| 449: | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 0 |
| 457: | 3 | 1 | 1 | 2 | 2 | 0 | 1 | 0 |
| 465: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 529: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 537: | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 577: | 0 | 2 | 0 | 1 | 2 | 0 | 0 | 0 |
| 585: | 0 | 1 | 1 | 2 | 1 | 0 | 0 | 1 |
| 593: | 0 | 1 | 3 | 1 | 0 | 1 | 3 | 1 |
| 601: | 1 | 1 | 1 | 1 | 0 | 2 | 0 | 2 |
| 609: | 1 | 2 | 0 | 3 | 4 | 7 | 3 | 5 |
| 617: | 7 | 5 | 9 | 10 | 9 | 6 | 8 | 6 |
| 625: | 10 | 9 | 16 | 8 | 5 | 12 | 11 | 10 |
| 633: | 11 | 12 | 11 | 15 | 12 | 6 | 13 | 13 |
| 641: | 12 | 15 | 10 | 9 | 9 | 2 | 9 | 3 |
| 649: | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 12

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

105
8/22/17

Sample Description: HTC-A03-S002-3642-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 13
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_054
Chamber Serial Number: 10006122B
Detector Serial Number: 54
Env. Background: System Bkgd 194225
Reagent Blank: <not performed>

Sample Size: 1.210E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 9:15:24 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.606 mL
Effective Efficiency: 0.1793 +/- 0.0106
Counting Efficiency: 0.1363 +/- 0.0024 on 11/18/2016 3:34:12 PM
Chem. Recovery Factor: 1.3152 +/- 0.0813

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.270 | 335.81 | 10.72 | 1.19 | 0.00E+000 | 24.4 |
| U-234 | | 4.721 | 68.49 | 23.79 | 0.51 | 0.00E+000 | 3.9 |
| U-235 | | 4.379 | 6.49 | 80.40 | 0.51 | 0.00E+000 | 3.0 |
| U-238 | | 4.155 | 59.49 | 25.54 | 0.51 | 0.00E+000 | 5.9 |

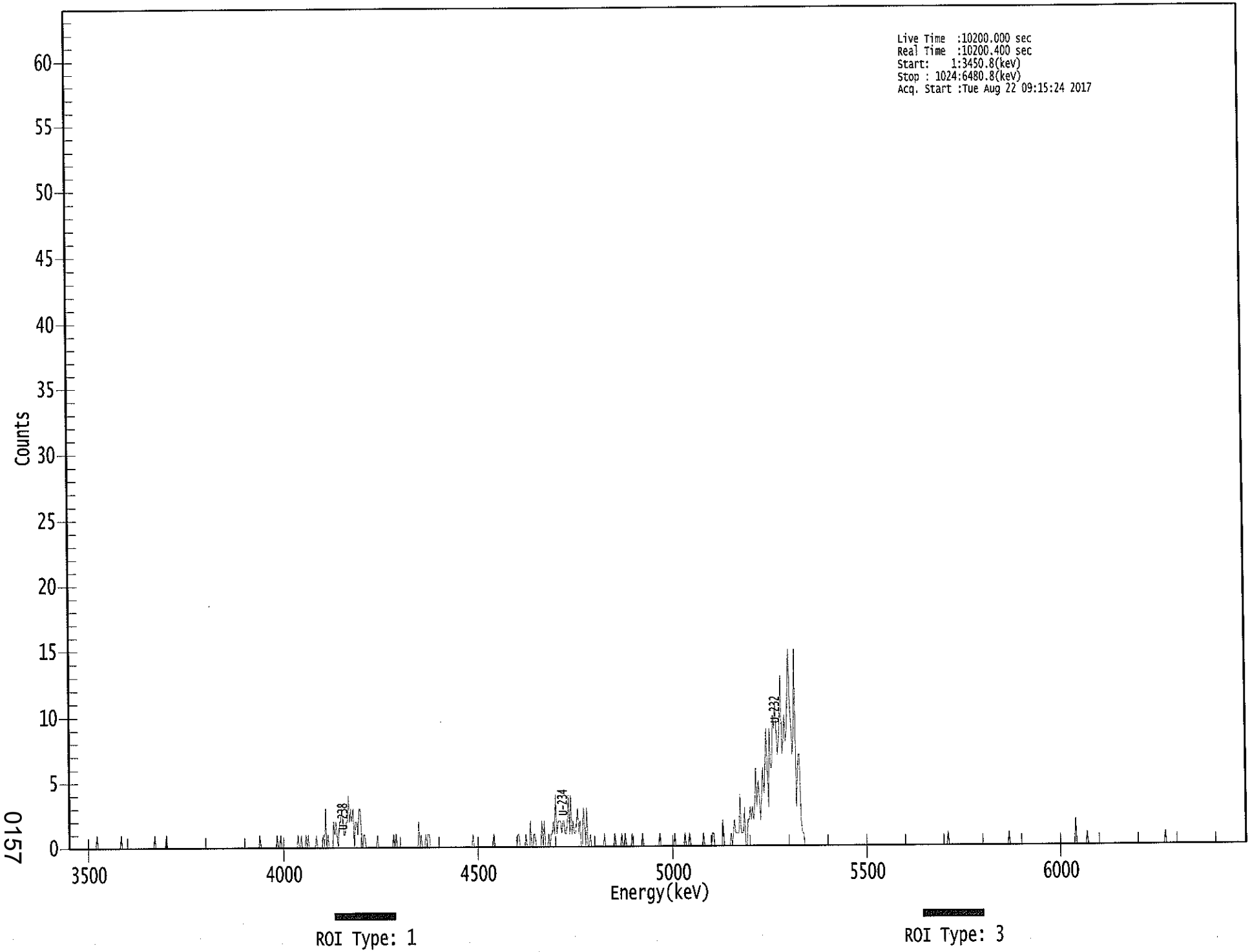
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.993 | 5302.50* | 4.12E+000 +/- 4.79E-001 | 8.08E-002 +/- 9.40E-003 |
| U-234 | 0.988 | 4761.50* | 8.38E-001 +/- 2.22E-001 | 6.42E-002 +/- 7.47E-003 |
| U-235 | 1.000 | 4385.50* | 9.80E-002 +/- 7.96E-002 | 7.92E-002 +/- 9.21E-003 |
| U-238 | 0.994 | 4184.40* | 7.25E-001 +/- 2.03E-001 | 6.39E-002 +/- 7.44E-003 |

AG
8/23/17

0000192219.CNF




0157

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 13

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 201: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 217: | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 |
| 225: | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 2 |
| 233: | 1 | 0 | 2 | 2 | 3 | 2 | 1 | 1 |
| 241: | 2 | 2 | 4 | 2 | 3 | 2 | 3 | 0 |
| 249: | 2 | 2 | 1 | 3 | 3 | 1 | 0 | 1 |
| 257: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 305: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 313: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 13

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 393: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 401: | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 409: | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 417: | 1 | 0 | 1 | 1 | 2 | 1 | 4 | 1 |
| 425: | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 |
| 433: | 2 | 4 | 1 | 4 | 1 | 2 | 1 | 1 |
| 441: | 2 | 3 | 1 | 2 | 0 | 0 | 3 | 2 |
| 449: | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 481: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 489: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 529: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 537: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 577: | 1 | 2 | 1 | 1 | 1 | 1 | 4 | 1 |
| 585: | 1 | 1 | 3 | 0 | 0 | 2 | 2 | 3 |
| 593: | 2 | 3 | 2 | 3 | 6 | 3 | 5 | 4 |
| 601: | 2 | 4 | 6 | 4 | 6 | 9 | 6 | 3 |
| 609: | 9 | 6 | 6 | 10 | 9 | 11 | 9 | 7 |
| 617: | 8 | 10 | 13 | 7 | 8 | 10 | 8 | 9 |
| 625: | 12 | 15 | 11 | 9 | 7 | 9 | 15 | 3 |
| 633: | 5 | 7 | 7 | 2 | 1 | 1 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 13

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

KB 8/22/17

# Apex-Alpha™

Sample Description: HTC-A03-S002-4248-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 14
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_050
Chamber Serial Number: 10006121B
Detector Serial Number: 50
Env. Background: System Bkgd 194222
Reagent Blank: <not performed>

Sample Size: 1.080E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 12:17:14 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.606 mL
Effective Efficiency: 0.1679 +/- 0.0103
Counting Efficiency: 0.1433 +/- 0.0025 on 11/18/2016 3:34:18 PM
Chem. Recovery Factor: 1.1722 +/- 0.0745

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.278 | 314.45 | 11.11 | 2.55 | 0.00E+000 | 22.5 |
| U-234 | | 4.718 | 52.64 | 27.42 | 1.36 | 0.00E+000 | 4.9 |
| U-235 | | 4.391 | 5.49 | 88.08 | 0.51 | 0.00E+000 | 3.0 |
| U-238 | | 4.162 | 35.47 | 33.73 | 1.53 | 0.00E+000 | 4.9 |

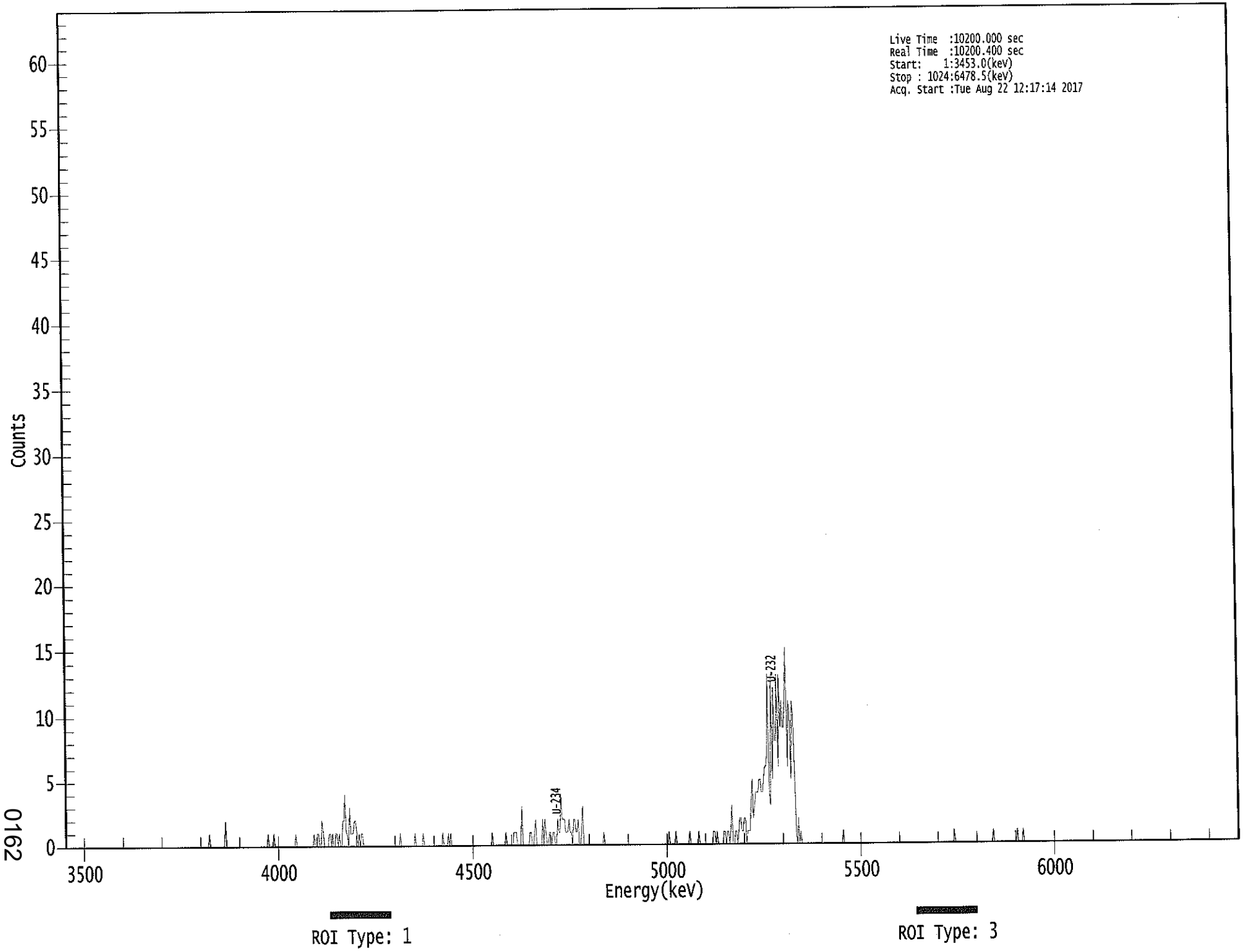
T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.996 | 5302.50* | 4.62E+000 +/- 5.53E-001 | 1.23E-001 +/- 1.48E-002 |
| U-234 | 0.986 | 4761.50* | 7.71E-001 +/- 2.31E-001 | 1.00E-001 +/- 1.20E-002 |
| U-235 | 1.000 | 4385.50* | 9.92E-002 +/- 8.81E-002 | 9.48E-002 +/- 1.14E-002 |
| U-238 | 0.996 | 4184.40* | 5.17E-001 +/- 1.85E-001 | 1.04E-001 +/- 1.24E-002 |

AG 8/23/17

0000192257.CNF




0162

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 14

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
| 225: | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 233: | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 241: | 0 | 2 | 2 | 4 | 1 | 1 | 0 | 3 |
| 249: | 1 | 1 | 1 | 2 | 2 | 1 | 0 | 1 |
| 257: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

Sample Title: 14

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 393: | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| 401: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 409: | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 417: | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 0 |
| 425: | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 4 |
| 433: | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 |
| 441: | 1 | 0 | 2 | 2 | 1 | 1 | 2 | 0 |
| 449: | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 529: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 569: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 577: | 1 | 1 | 0 | 1 | 3 | 0 | 0 | 1 |
| 585: | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 2 |
| 593: | 2 | 0 | 1 | 1 | 1 | 3 | 5 | 2 |
| 601: | 3 | 4 | 4 | 4 | 5 | 5 | 4 | 4 |
| 609: | 5 | 6 | 6 | 7 | 13 | 4 | 3 | 13 |
| 617: | 5 | 12 | 8 | 8 | 13 | 6 | 13 | 9 |
| 625: | 11 | 9 | 9 | 12 | 15 | 6 | 11 | 10 |
| 633: | 5 | 11 | 10 | 6 | 1 | 0 | 2 | 0 |
| 641: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 14

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 833: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

KB 8/22/17

# Apex-Alpha™

Sample Description: HTC-A03-S003-0006-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 15
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_052
Chamber Serial Number: 10006123B
Detector Serial Number: 52
Env. Background: System Bkgd 194223
Reagent Blank: <not performed>

Sample Size: 1.200E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 12:17:20 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.607 mL
Effective Efficiency: 0.2046 +/- 0.0115
Counting Efficiency: 0.1737 +/- 0.0030 on 11/18/2016 3:34:15 PM
Chem. Recovery Factor: 1.1777 +/- 0.0690

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.259 | 384.00 | 10.02 | 0.00 | 0.00E+000 | 12.8 |
| U-234 | | 4.721 | 67.15 | 24.09 | 0.85 | 0.00E+000 | 5.9 |
| U-235 | | 4.383 | 7.49 | 74.41 | 0.51 | 0.00E+000 | 3.0 |
| U-238 | | 4.136 | 72.66 | 23.06 | 0.34 | 0.00E+000 | 7.6 |

T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.987 | 5302.50* | 4.16E+000 +/- 4.57E-001 | 6.50E-002 +/- 7.14E-003 |
| U-234 | 0.989 | 4761.50* | 7.26E-001 +/- 1.92E-001 | 6.47E-002 +/- 7.11E-003 |
| U-235 | 1.000 | 4385.50* | 9.99E-002 +/- 7.52E-002 | 7.00E-002 +/- 7.69E-003 |
| U-238 | 0.984 | 4184.40* | 7.82E-001 +/- 2.00E-001 | 5.15E-002 +/- 5.65E-003 |

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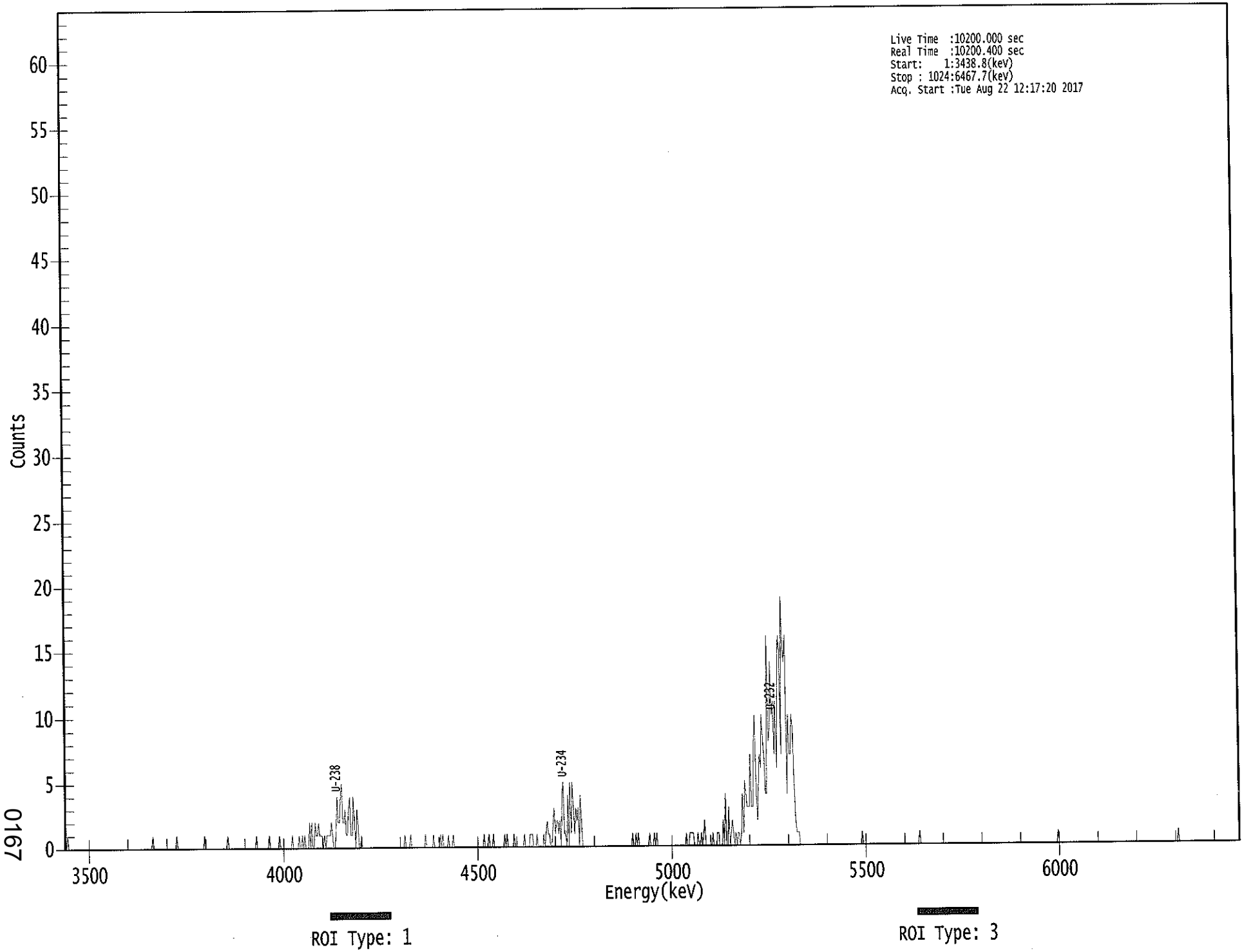
0000192259.CNF




0167

```
*****************************************************
*****   S P E C T R A L   D A T A   R E P O R T   *****
*****************************************************
```

Sample Title: 15

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 185: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 201: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 209: | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 0 |
| 217: | 0 | 2 | 1 | 1 | 2 | 1 | 1 | 1 |
| 225: | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 |
| 233: | 1 | 0 | 0 | 1 | 4 | 2 | 2 | 4 |
| 241: | 5 | 2 | 2 | 3 | 1 | 1 | 3 | 4 |
| 249: | 1 | 1 | 4 | 2 | 0 | 3 | 2 | 0 |
| 257: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 297: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 329: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 337: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 369: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Sample Title: 15

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 385: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 401: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 409: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 417: | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 0 |
| 425: | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 0 |
| 433: | 4 | 5 | 1 | 1 | 0 | 4 | 0 | 5 |
| 441: | 1 | 5 | 3 | 1 | 3 | 2 | 3 | 0 |
| 449: | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 497: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 513: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 545: | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 553: | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 569: | 1 | 0 | 0 | 0 | 2 | 0 | 4 | 0 |
| 577: | 0 | 3 | 0 | 1 | 2 | 1 | 0 | 1 |
| 585: | 0 | 1 | 1 | 0 | 1 | 4 | 1 | 5 |
| 593: | 4 | 3 | 3 | 3 | 7 | 3 | 3 | 7 |
| 601: | 10 | 4 | 2 | 5 | 7 | 6 | 10 | 8 |
| 609: | 7 | 4 | 4 | 16 | 8 | 9 | 14 | 10 |
| 617: | 11 | 7 | 11 | 6 | 12 | 16 | 15 | 7 |
| 625: | 19 | 15 | 14 | 16 | 4 | 10 | 7 | 7 |
| 633: | 10 | 9 | 5 | 2 | 1 | 1 | 1 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 15

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KB 8/22/14

Sample Description: HTC-A03-S003-0612-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 16
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_053
Chamber Serial Number: 10006122A
Detector Serial Number: 53
Env. Background: System Bkgd 194224
Reagent Blank: <not performed>

Sample Size: 1.120E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 12:17:16 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.602 mL
Effective Efficiency: 0.1846 +/- 0.0108
Counting Efficiency: 0.1515 +/- 0.0026 on 11/18/2016 3:34:14 PM
Chem. Recovery Factor: 1.2191 +/- 0.0746

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.308 | 343.32 | 10.59 | 0.68 | 0.00E+000 | 4.6 |
| U-234 | | 4.768 | 89.66 | 20.75 | 0.34 | 0.00E+000 | 5.9 |
| U-235 | | 4.450 | 6.83 | 76.08 | 0.17 | 0.00E+000 | 5.9 |
| U-238 | | 4.186 | 74.00 | 22.94 | 0.00 | 0.00E+000 | 4.3 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 1.000 | 5302.50* | 4.42E+000 +/- 5.09E-001 | 7.26E-002 +/- 8.36E-003 |
| U-234 | 1.000 | 4761.50* | 1.15E+000 +/- 2.73E-001 | 6.14E-002 +/- 7.07E-003 |
| U-235 | 0.971 | 4385.50* | 1.08E-001 +/- 8.32E-002 | 6.61E-002 +/- 7.61E-003 |
| U-238 | 1.000 | 4184.40* | 9.46E-001 +/- 2.43E-001 | 7.67E-002 +/- 8.82E-003 |

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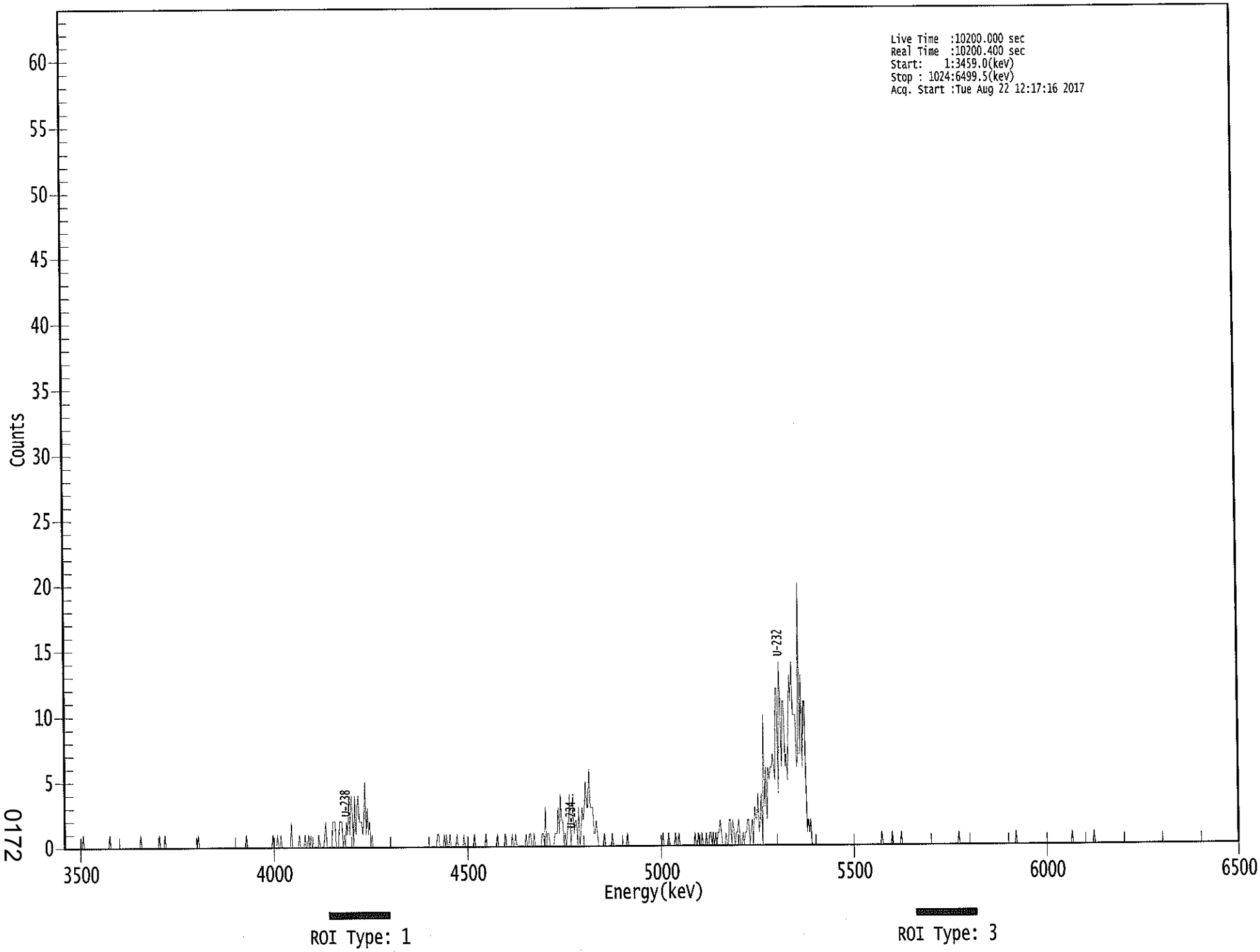
0000192258.CNF

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**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 16

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 185: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 209: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 225: | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 233: | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 2 |
| 241: | 2 | 2 | 0 | 1 | 0 | 2 | 1 | 4 |
| 249: | 1 | 4 | 3 | 0 | 4 | 1 | 3 | 4 |
| 257: | 2 | 2 | 2 | 1 | 2 | 5 | 1 | 3 |
| 265: | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 329: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 337: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 345: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 16

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 385: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 393: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 401: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 409: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 417: | 1 | 0 | 3 | 0 | 1 | 1 | 0 | 0 |
| 425: | 0 | 0 | 1 | 1 | 1 | 3 | 1 | 4 |
| 433: | 2 | 2 | 0 | 1 | 0 | 1 | 2 | 4 |
| 441: | 0 | 1 | 4 | 1 | 2 | 2 | 0 | 3 |
| 449: | 0 | 1 | 3 | 2 | 3 | 5 | 3 | 3 |
| 457: | 6 | 3 | 3 | 3 | 1 | 1 | 2 | 1 |
| 465: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 529: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 553: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 561: | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 569: | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 1 |
| 577: | 0 | 0 | 2 | 2 | 0 | 2 | 1 | 0 |
| 585: | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 0 |
| 593: | 1 | 1 | 2 | 2 | 0 | 1 | 2 | 0 |
| 601: | 3 | 2 | 2 | 4 | 1 | 2 | 4 | 0 |
| 609: | 10 | 3 | 6 | 2 | 6 | 5 | 6 | 6 |
| 617: | 7 | 6 | 5 | 12 | 12 | 4 | 14 | 11 |
| 625: | 6 | 11 | 11 | 6 | 7 | 5 | 10 | 13 |
| 633: | 11 | 14 | 10 | 10 | 10 | 6 | 7 | 20 |
| 641: | 7 | 13 | 6 | 11 | 11 | 5 | 1 | 2 |
| 649: | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 16

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NB 8/22/17

# Apex-Alpha™

Sample Description: HTC-A03-S003-1218-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 17
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_054
Chamber Serial Number: 10006122B
Detector Serial Number: 54
Env. Background: System Bkgd 194225
Reagent Blank: <not performed>

Sample Size: 1.140E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 12:17:18 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.606 mL
Effective Efficiency: 0.2044 +/- 0.0115
Counting Efficiency: 0.1363 +/- 0.0024 on 11/18/2016 3:34:12 PM
Chem. Recovery Factor: 1.4992 +/- 0.0881

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.278 | 382.81 | 10.04 | 1.19 | 0.00E+000 | 16.6 |
| U-234 | | 4.734 | 99.49 | 19.71 | 0.51 | 0.00E+000 | 3.8 |
| U-235 | | 4.399 | 6.49 | 80.40 | 0.51 | 0.00E+000 | 3.0 |
| U-238 | | 4.152 | 80.49 | 21.93 | 0.51 | 0.00E+000 | 5.6 |

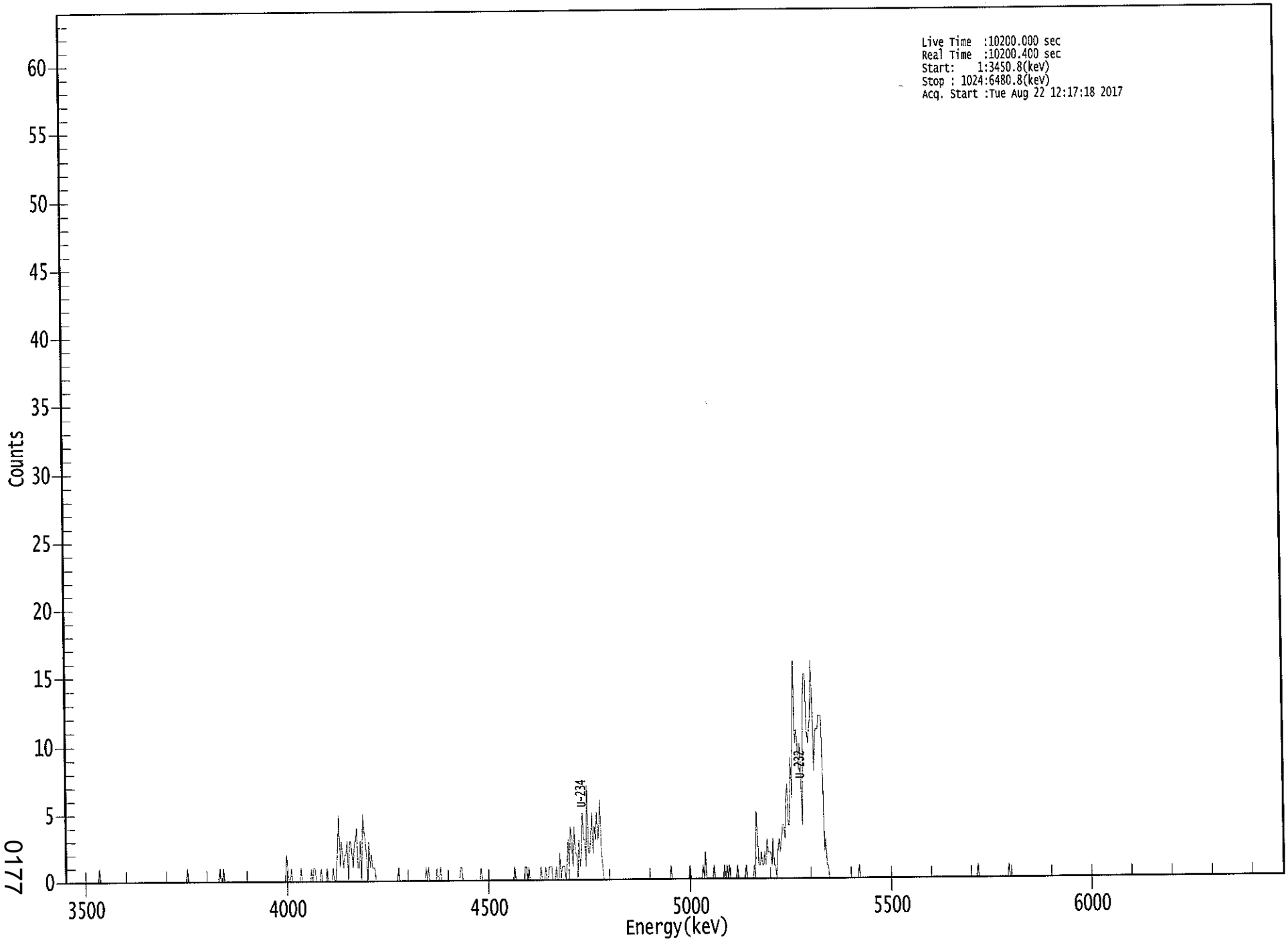
T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.996 | 5302.50* | 4.37E+000 +/- 4.81E-001 | 7.53E-002 +/- 8.28E-003 |
| U-234 | 0.994 | 4761.50* | 1.13E+000 +/- 2.56E-001 | 5.98E-002 +/- 6.58E-003 |
| U-235 | 0.999 | 4385.50* | 9.12E-002 +/- 7.40E-002 | 7.38E-002 +/- 8.12E-003 |
| U-238 | 0.992 | 4184.40* | 9.13E-001 +/- 2.24E-001 | 5.95E-002 +/- 6.55E-003 |

AG
8/23/17

0000192260.CNF




0177

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 17

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 185: | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 209: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 217: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 225: | 1 | 0 | 0 | 1 | 3 | 5 | 1 | 3 |
| 233: | 2 | 1 | 2 | 2 | 3 | 0 | 3 | 3 |
| 241: | 2 | 1 | 3 | 3 | 4 | 1 | 1 | 3 |
| 249: | 0 | 5 | 4 | 3 | 2 | 0 | 3 | 1 |
| 257: | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 305: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 313: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 17

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 393: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 401: | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 409: | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| 417: | 1 | 1 | 1 | 0 | 1 | 3 | 1 | 4 |
| 425: | 3 | 1 | 4 | 2 | 2 | 0 | 3 | 1 |
| 433: | 2 | 5 | 3 | 3 | 1 | 7 | 2 | 2 |
| 441: | 3 | 5 | 2 | 4 | 3 | 5 | 3 | 4 |
| 449: | 6 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 505: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 529: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 537: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 1 | 0 | 5 | 3 | 1 | 1 | 2 |
| 585: | 1 | 1 | 2 | 1 | 3 | 2 | 2 | 2 |
| 593: | 1 | 3 | 1 | 1 | 0 | 2 | 3 | 2 |
| 601: | 3 | 4 | 4 | 3 | 6 | 7 | 4 | 4 |
| 609: | 9 | 6 | 11 | 16 | 10 | 11 | 10 | 8 |
| 617: | 10 | 7 | 4 | 13 | 15 | 15 | 11 | 10 |
| 625: | 11 | 12 | 16 | 12 | 8 | 11 | 11 | 11 |
| 633: | 12 | 12 | 12 | 8 | 2 | 3 | 1 | 1 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 17

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KP 8/22/17

Sample Description: HTC-A03-S003-1824-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 18
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_056
Chamber Serial Number: 10006124B
Detector Serial Number: 56
Env. Background: System Bkgd 194227
Reagent Blank: <not performed>

Sample Size: 1.180E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 12:17:22 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.605 mL
Effective Efficiency: 0.2211 +/- 0.0120
Counting Efficiency: 0.1595 +/- 0.0027 on 11/18/2016 3:34:09 PM
Chem. Recovery Factor: 1.3864 +/- 0.0791

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.277 | 413.13 | 9.67 | 1.87 | 0.00E+000 | 20.3 |
| U-234 | | 4.718 | 77.98 | 22.36 | 1.02 | 0.00E+000 | 4.7 |
| U-235 | | 4.423 | 1.15 | 249.59 | 0.85 | 0.00E+000 | 3.0 |
| U-238 | | 4.147 | 85.15 | 21.36 | 0.85 | 0.00E+000 | 9.9 |

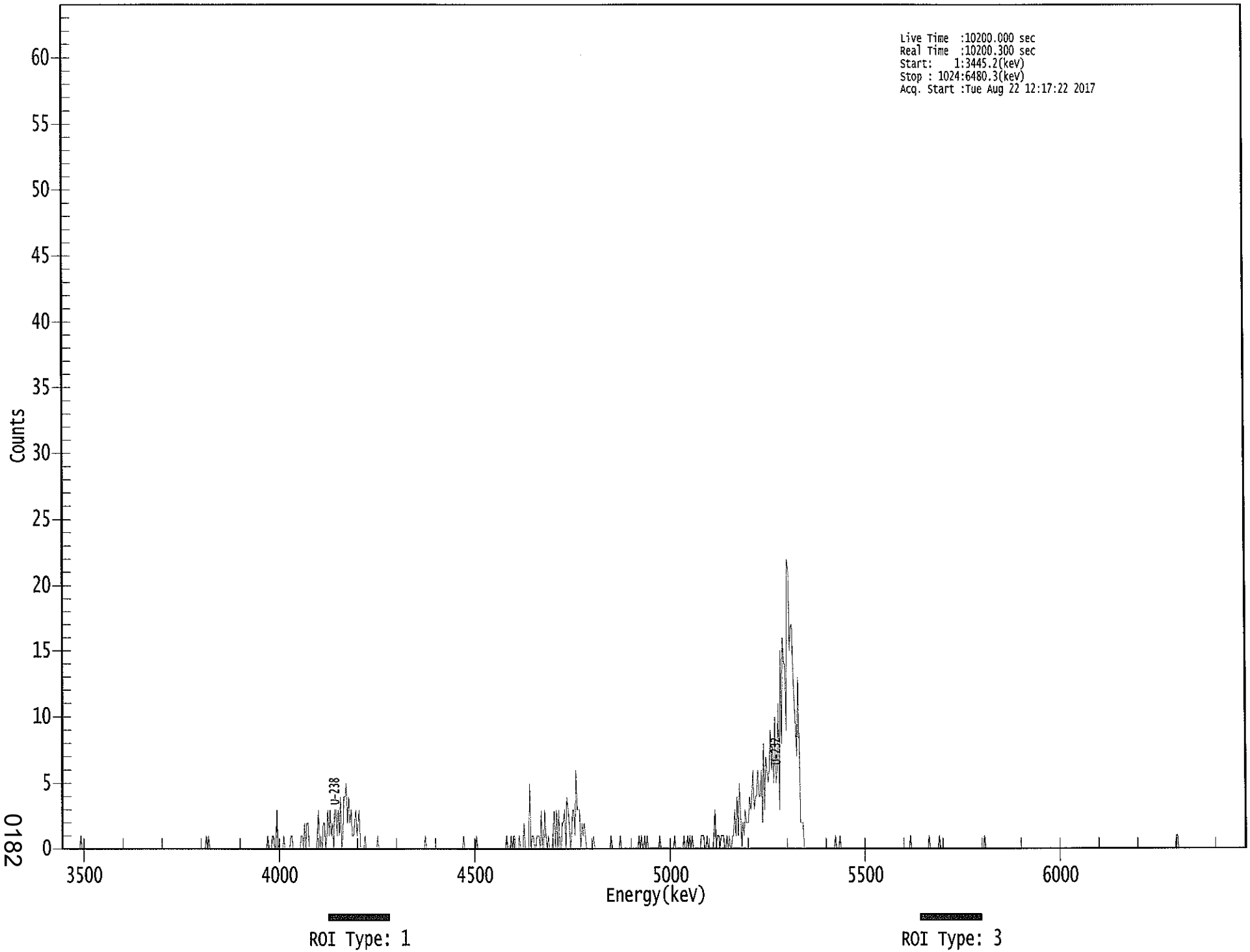
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.995 | 5302.50* | 4.22E+000 +/- 4.50E-001 | 7.73E-002 +/- 8.25E-003 |
| U-234 | 0.987 | 4761.50* | 7.94E-001 +/- 1.97E-001 | 6.41E-002 +/- 6.84E-003 |
| U-235 | 0.990 | 4385.50* | 1.44E-002 +/- 3.61E-002 | 7.52E-002 +/- 8.02E-003 |
| U-238 | 0.990 | 4184.40* | 8.63E-001 +/- 2.06E-001 | 6.07E-002 +/- 6.47E-003 |

AG
8/23/17

0000192261.CNF




0182

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 18

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 185: | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 |
| 193: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 209: | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 1 |
| 225: | 0 | 2 | 2 | 0 | 1 | 3 | 1 | 3 |
| 233: | 1 | 2 | 0 | 3 | 3 | 1 | 3 | 1 |
| 241: | 4 | 0 | 1 | 4 | 4 | 5 | 2 | 4 |
| 249: | 2 | 3 | 1 | 1 | 2 | 3 | 1 | 2 |
| 257: | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 18

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 385: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 393: | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 |
| 401: | 0 | 0 | 0 | 5 | 0 | 1 | 1 | 0 |
| 409: | 0 | 1 | 1 | 1 | 0 | 3 | 0 | 0 |
| 417: | 3 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 425: | 3 | 0 | 3 | 0 | 3 | 0 | 0 | 2 |
| 433: | 2 | 3 | 0 | 4 | 3 | 2 | 0 | 1 |
| 441: | 3 | 3 | 1 | 6 | 3 | 3 | 3 | 0 |
| 449: | 2 | 1 | 2 | 1 | 0 | 0 | 0 | 0 |
| 457: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 505: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 553: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 561: | 0 | 0 | 1 | 3 | 0 | 1 | 1 | 0 |
| 569: | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 577: | 0 | 0 | 1 | 1 | 3 | 1 | 4 | 1 |
| 585: | 5 | 3 | 0 | 2 | 1 | 3 | 2 | 2 |
| 593: | 2 | 4 | 3 | 4 | 6 | 3 | 4 | 4 |
| 601: | 6 | 4 | 4 | 6 | 2 | 8 | 3 | 7 |
| 609: | 6 | 5 | 6 | 9 | 6 | 8 | 5 | 10 |
| 617: | 5 | 6 | 11 | 3 | 15 | 8 | 16 | 14 |
| 625: | 14 | 9 | 22 | 21 | 15 | 17 | 17 | 13 |
| 633: | 11 | 9 | 7 | 13 | 8 | 2 | 2 | 2 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 18

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KB 8/22/17

Sample Description: HTC-A03-S003-2430-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 19
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_057
Chamber Serial Number: 01017326A
Detector Serial Number: 57
Env. Background: System Bkgd 194228
Reagent Blank: <not performed>

Sample Size: 1.190E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 12:17:10 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.604 mL
Effective Efficiency: 0.1980 +/- 0.0113
Counting Efficiency: 0.1646 +/- 0.0028 on 11/18/2016 3:34:08 PM
Chem. Recovery Factor: 1.2028 +/- 0.0714

Peak Match Tolerance: 0.150 MeV

PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.273 | 369.83 | 10.19 | 0.17 | 0.00E+000 | 22.9 |
| U-234 | | 4.736 | 68.83 | 23.66 | 0.17 | 0.00E+000 | 5.9 |
| U-235 | | 4.415 | 5.00 | 96.02 | 0.00 | 0.00E+000 | 3.0 |
| U-238 | | 4.156 | 85.66 | 21.23 | 0.34 | 0.00E+000 | 3.3 |

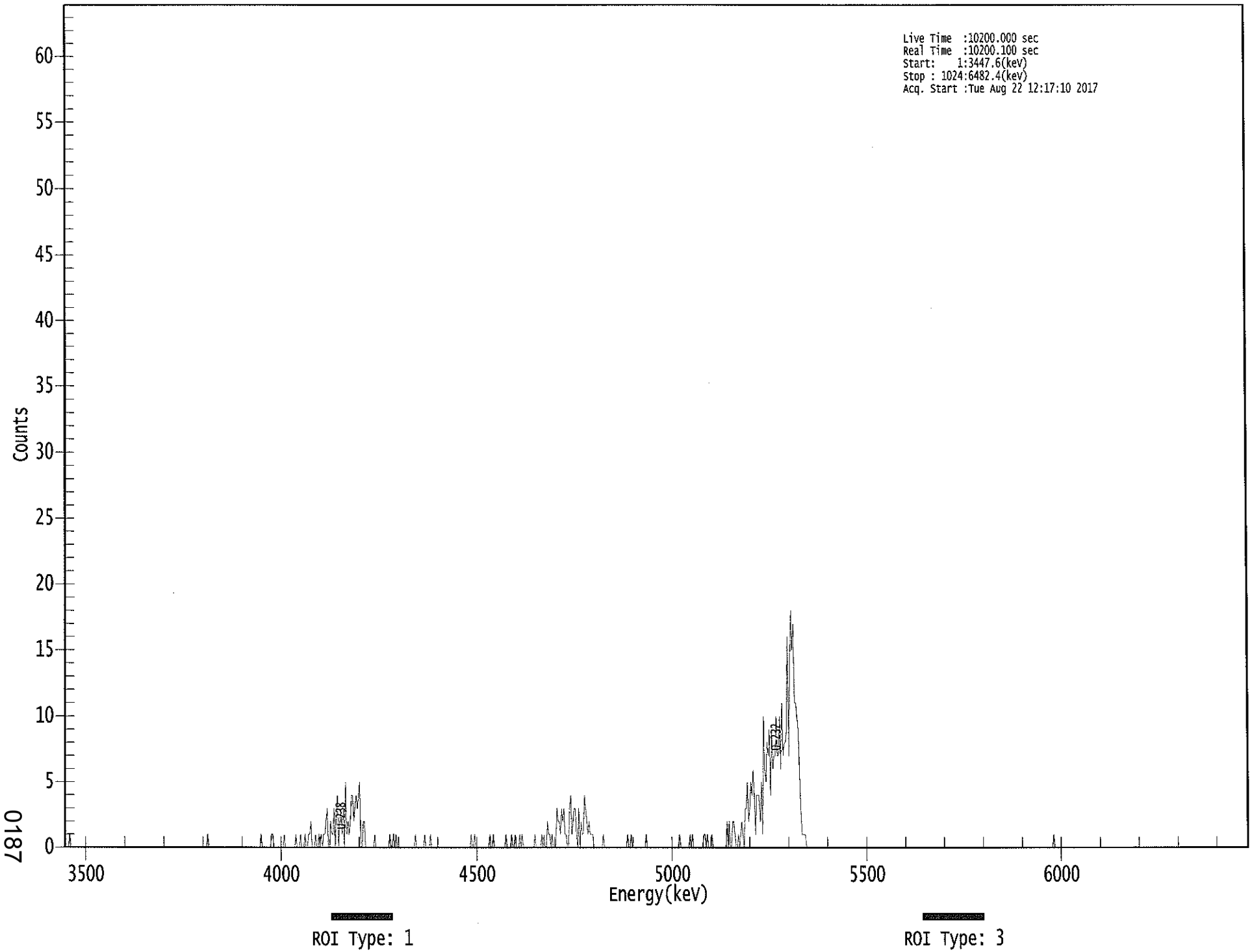
T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.994 | 5302.50* | 4.18E+000 +/- 4.66E-001 | 4.72E-002 +/- 5.26E-003 |
| U-234 | 0.995 | 4761.50* | 7.76E-001 +/- 2.03E-001 | 4.70E-002 +/- 5.24E-003 |
| U-235 | 0.994 | 4385.50* | 6.95E-002 +/- 6.72E-002 | 8.33E-002 +/- 9.29E-003 |
| U-238 | 0.994 | 4184.40* | 9.61E-001 +/- 2.30E-001 | 5.36E-002 +/- 5.98E-003 |

AG 8/23/17

# 0000192246.CNF



**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 19

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 169: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 201: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 209: | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 |
| 217: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 225: | 1 | 2 | 3 | 0 | 0 | 2 | 1 | 1 |
| 233: | 3 | 0 | 3 | 4 | 0 | 2 | 3 | 1 |
| 241: | 3 | 0 | 5 | 1 | 2 | 1 | 2 | 4 |
| 249: | 4 | 2 | 3 | 4 | 3 | 4 | 5 | 0 |
| 257: | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 313: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 353: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 19

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 385: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 393: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 401: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 409: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 417: | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 425: | 3 | 2 | 2 | 1 | 3 | 2 | 3 | 1 |
| 433: | 1 | 0 | 0 | 3 | 4 | 1 | 2 | 3 |
| 441: | 3 | 1 | 0 | 3 | 0 | 2 | 1 | 1 |
| 449: | 4 | 3 | 2 | 1 | 2 | 1 | 1 | 1 |
| 457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 465: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 489: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 497: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 553: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 |
| 577: | 2 | 2 | 1 | 0 | 0 | 1 | 0 | 1 |
| 585: | 2 | 1 | 0 | 3 | 3 | 5 | 2 | 3 |
| 593: | 5 | 4 | 6 | 4 | 1 | 4 | 4 | 4 |
| 601: | 2 | 5 | 1 | 10 | 6 | 5 | 8 | 7 |
| 609: | 9 | 4 | 9 | 6 | 7 | 7 | 10 | 7 |
| 617: | 7 | 10 | 6 | 11 | 7 | 8 | 8 | 9 |
| 625: | 16 | 7 | 14 | 18 | 15 | 17 | 11 | 11 |
| 633: | 10 | 9 | 6 | 3 | 1 | 1 | 1 | 1 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 19

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NB 9/22/17

# Apex-Alpha™

Sample Description: HTC-A03-S003-3036-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001922
Batch Identification: 1707087A-UU
Sample Identification: 20
Sample Geometry: Shelf 2
Procedure Description: U iso

Detector Name: Alpha_058
Chamber Serial Number: 01017326B
Detector Serial Number: 58
Env. Background: System Bkgd 194229
Reagent Blank: <not performed>

Sample Size: 1.360E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:32:57 AM
Acquisition Date/Time: 8/22/2017 12:17:12 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: U232_UU-10A
Tracer Quantity: 0.605 mL
Effective Efficiency: 0.2054 +/- 0.0115
Counting Efficiency: 0.1665 +/- 0.0028 on 11/18/2016 3:34:06 PM
Chem. Recovery Factor: 1.2339 +/- 0.0722

Peak Match Tolerance: 0.150 MeV

## PEAK AREA REPORT

| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| U-232 | T | 5.274 | 384.32 | 10.01 | 0.68 | 0.00E+000 | 22.3 |
| U-234 | | 4.733 | 110.32 | 18.73 | 0.68 | 0.00E+000 | 5.6 |
| U-235 | | 4.419 | 6.00 | 86.43 | 0.00 | 0.00E+000 | 3.0 |
| U-238 | | 4.146 | 99.64 | 19.79 | 1.36 | 0.00E+000 | 6.7 |

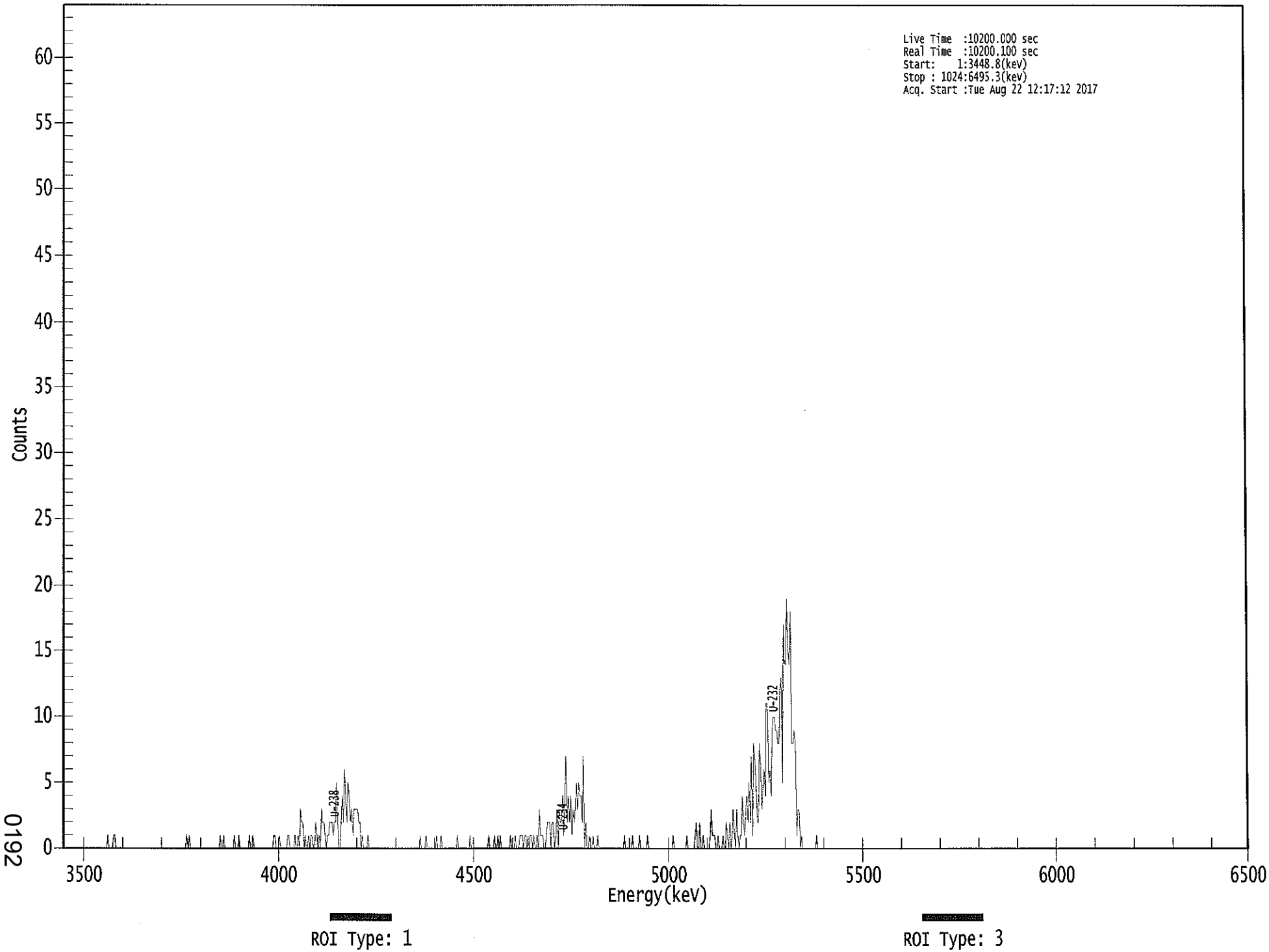
T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| U-232 | 0.994 | 5302.50* | 3.66E+000 +/- 4.02E-001 | 5.37E-002 +/- 5.90E-003 |
| U-234 | 0.994 | 4761.50* | 1.05E+000 +/- 2.28E-001 | 5.36E-002 +/- 5.88E-003 |
| U-235 | 0.992 | 4385.50* | 7.03E-002 +/- 6.13E-002 | 7.03E-002 +/- 7.72E-003 |
| U-238 | 0.989 | 4184.40* | 9.43E-001 +/- 2.13E-001 | 6.49E-002 +/- 7.12E-003 |

AG 8/23/17

0000192247.CNF




0192

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 20

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 41: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 137: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 185: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 201: | 0 | 0 | 1 | 0 | 3 | 2 | 2 | 0 |
| 209: | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 217: | 0 | 2 | 1 | 0 | 1 | 0 | 3 | 2 |
| 225: | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 2 |
| 233: | 1 | 2 | 2 | 5 | 2 | 0 | 0 | 2 |
| 241: | 4 | 2 | 6 | 4 | 2 | 5 | 4 | 2 |
| 249: | 3 | 1 | 3 | 3 | 3 | 3 | 2 | 2 |
| 257: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 313: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

Sample Title: 20

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 393: | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| 401: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 409: | 1 | 0 | 3 | 1 | 1 | 1 | 0 | 0 |
| 417: | 1 | 2 | 2 | 2 | 0 | 2 | 2 | 0 |
| 425: | 1 | 3 | 0 | 3 | 2 | 2 | 4 | 1 |
| 433: | 4 | 7 | 2 | 4 | 2 | 4 | 1 | 3 |
| 441: | 2 | 3 | 5 | 3 | 5 | 4 | 4 | 2 |
| 449: | 7 | 0 | 2 | 0 | 0 | 1 | 0 | 0 |
| 457: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 481: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 489: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 497: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 1 |
| 553: | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 |
| 561: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 569: | 1 | 0 | 0 | 2 | 1 | 0 | 2 | 0 |
| 577: | 1 | 3 | 1 | 0 | 3 | 1 | 0 | 1 |
| 585: | 1 | 4 | 2 | 1 | 3 | 4 | 2 | 5 |
| 593: | 2 | 7 | 1 | 8 | 7 | 5 | 2 | 2 |
| 601: | 8 | 6 | 3 | 5 | 6 | 4 | 11 | 11 |
| 609: | 5 | 6 | 4 | 9 | 10 | 10 | 9 | 9 |
| 617: | 8 | 8 | 12 | 13 | 5 | 17 | 14 | 14 |
| 625: | 19 | 15 | 14 | 18 | 8 | 8 | 9 | 8 |
| 633: | 1 | 3 | 3 | 0 | 1 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 20

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

8/22/2017 5:27:54 AM

Apex-Alpha™

# QA SUMMARY REPORT

## Review Of QA Results - Pulser Check

Date : 8/22/2017
Time : 5:27:54 AM

| CHAMBER | DEVICE | PARAMETER | FLAG | DATE |
|---|---|---|---|---|
| Alpha_001 | 21f | ALL | Not Done | |
| Alpha_002 | 21f | ALL | Not Done | |
| Alpha_003 | 21f | ALL | Passed | 8/22/2017 5:12:47 AM |
| Alpha_004 | 21f | ALL | Passed | 8/22/2017 5:12:48 AM |
| Alpha_005 | 21f | ALL | Not Done | |
| Alpha_006 | 21f | ALL | Not Done | |
| Alpha_007 | 21f | ALL | Not Done | |
| Alpha_008 | 21f | ALL | Not Done | |
| Alpha_009 | 21f | ALL | Not Done | |
| Alpha_010 | 21f | ALL | Passed | 8/22/2017 5:12:48 AM |
| Alpha_011 | 21f | ALL | Passed | 8/22/2017 5:12:49 AM |
| Alpha_012 | 21f | ALL | Passed | 8/22/2017 5:12:50 AM |
| Alpha_013 | 21f | ALL | Not Done | |
| Alpha_014 | 21f | ALL | Passed | 8/22/2017 5:12:51 AM |
| Alpha_015 | 21f | Peak FWHM | Action | 8/18/2017 4:58:23 AM |
| Alpha_016 | 21f | ALL | Not Done | |
| Alpha_033 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:12:52 AM |
| Alpha_034 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:12:54 AM |
| Alpha_035 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:12:55 AM |
| Alpha_036 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:12:57 AM |
| Alpha_037 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:12:59 AM |
| Alpha_038 | Alpha Analyst100DC | Peak Energy | Action | 8/22/2017 5:13:02 AM |
| Alpha_039 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:04 AM |
| Alpha_040 | Alpha Analyst100DC | Peak FWHM | Action | 8/22/2017 5:13:07 AM |
| Alpha_041 | Alpha Analyst100DC | ALL | Not Done | |
| Alpha_042 | Alpha Analyst100DC | ALL | Not Done | |
| Alpha_043 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:09 AM |
| Alpha_044 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:11 AM |
| Alpha_045 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:14 AM |
| Alpha_046 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:16 AM |
| Alpha_047 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:19 AM |
| Alpha_048 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:21 AM |
| Alpha_049 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:24 AM |
| Alpha_050 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:27 AM |
| Alpha_051 | Alpha Analyst100DC | ALL | Passed | 8/18/2017 4:59:01 AM |
| Alpha_052 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:29 AM |
| Alpha_053 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:32 AM |
| Alpha_054 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:34 AM |
| Alpha_055 | Alpha Analyst100DC | ALL | Passed | 8/18/2017 4:59:12 AM |
| Alpha_056 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:37 AM |
| Alpha_057 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:40 AM |
| Alpha_058 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:43 AM |

Review of QA Results - Pulser Check

8/22/2017 5:27:54 AM

| CHAMBER | DEVICE | PARAMETER | FLAG | DATE |
|---|---|---|---|---|
| Alpha_059 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:46 AM |
| Alpha_060 | Alpha Analyst100DC | ALL | Passed | 8/22/2017 5:13:49 AM |

**APPROVED BY:** _____

**APPROVAL DATE:** 8/22/17

```
*********************************************************************
*****          L I B R A R Y   L I S T I N G   R E P O R T        *****
*********************************************************************
```

Nuclide Library Title: Uranium

Nuclide Library Description: U-232,-234,-235,-238

| Nuclide Name | Half-Life (Seconds) | Energy (keV ) | Energy Uncert. (keV ) | Yield (%) | Yield Uncert.(Abs.+-) |
|---|---|---|---|---|---|
| U-232 | 2.174E+009 | 5302.500* | 0.000 | 99.8000 | 0.0000 |
| U-234 | 7.731E+012 | 4761.500* | 0.000 | 99.8000 | 0.0000 |
| U-235 | 2.221E+016 | 4385.500* | 0.000 | 80.9000 | 0.0000 |
| U-238 | 1.410E+017 | 4184.400* | 0.000 | 100.2300 | 0.0000 |

* = key line

TOTALS: 4 Nuclides 4 Energy Lines

# SECTION IX

# ANALYTICAL DATA (ISOTOPIC THORIUM)

Eberline Analytical
Oak Ridge Laboratory
Analysis Sheet

# 17-07087
## ThISO
### Run 1



| | |
|---|---|
| Work Order | 17-07087 |
| Analysis Code | ThISO |
| Run | 1 |
| Date Received | 7/18/2017 |
| Lab Deadline | 8/10/2017 |
| Client | Weston Solutions, Inc. |
| Project | 94759 |
| Report Level | 4 |
| Activity Units | pCi |
| Aliquot Units | g |
| Matrix | SO |
| Method | EPA 907.0 Modified |
| Instrument Type | Alpha Spectroscopy |
| Radiometric Tracer | Th-229 |
| Radiometric Sol# | Th-18a |
| Tracer Act (dpm/g) | 22.46 |
| Carrier | |
| Carrier Conc (mg/ml) | |
| | |
| | |
| | |

| Internal Fraction | Sample Desc | Client ID | Login CPM | Sample Date | Sample Aliquot |
|---|---|---|---|---|---|
| 01 | LCS | LCS | | 07/19/17 00:00 | 1.0000E+00 |
| 02 | MBL | BLANK | | 07/19/17 00:00 | 1.0000E+00 |
| 03 | DUP | HTC-A03-S002-0006-01 | 49 | 05/15/17 09:39 | 1.2200E+00 |
| 04 | DO | HTC-A03-S002-0006-01 | 49 | 05/15/17 09:39 | 1.2100E+00 |
| 05 | TRG | HTC-A03-S002-0612-01 | 32 | 05/15/17 09:36 | 1.0400E+00 |
| 06 | TRG | HTC-A03-S002-1218-01 | 51 | 05/15/17 09:33 | 1.5900E+00 |
| 07 | TRG | HTC-A03-S002-1824-01 | 37 | 05/15/17 09:27 | 1.0600E+00 |
| 08 | TRG | HTC-A03-S002-2430-01 | 39 | 05/15/17 09:24 | 1.2600E+00 |
| 09 | MSO | HTC-A03-S002-3036-01 | 48 | 05/15/17 09:21 | 1.0800E+00 |
| 10 | MS | HTC-A03-S002-3036-01 | 34 | 05/15/17 09:39 | 1.0600E+00 |
| 11 | MSD | HTC-A03-S002-3036-01 MSD | 34 | 05/15/17 09:21 | 1.0900E+00 |
| 12 | TRG | HTC-A03-S002-3036-02 | 35 | 05/15/17 09:21 | 1.2200E+00 |
| 13 | TRG | HTC-A03-S002-3642-01 | 45 | 05/15/17 09:18 | 1.1900E+00 |
| 14 | TRG | HTC-A03-S002-4248-01 | 37 | 05/15/17 09:15 | 1.3200E+00 |
| 15 | TRG | HTC-A03-S003-0006-01 | 33 | 05/15/17 08:48 | 1.2100E+00 |
| 16 | TRG | HTC-A03-S003-0612-01 | 33 | 05/15/17 08:45 | 1.4800E+00 |
| 17 | TRG | HTC-A03-S003-1218-01 | 39 | 05/15/17 08:42 | 1.1300E+00 |
| 18 | TRG | HTC-A03-S003-1824-01 | 42 | 05/15/17 08:39 | 1.2500E+00 |
| 19 | TRG | HTC-A03-S003-2430-01 | 40 | 05/15/17 08:36 | 1.1200E+00 |
| 20 | TRG | HTC-A03-S003-3036-01 | 47 | 05/15/17 08:33 | 1.2200E+00 |

0200

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

# 17-07087
## ThISO
### Run 1



| Internal Fraction | Sample Desc | Tracer Aliquot (g) | Tracer Total ACT (dpm) | Radiometric Tracer (pCi) | Radiometric % Rec | Grav Carrier Added (ml) | Grav Filter Tare (g) | Grav Filter Final (g) | Grav Filter Net (g) | Grav % Rec | Mean % Rec | SAF 1* | SAF 2* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | 0.4708 | 10.6 | | 0.00 | | | | | | | | |
| 02 | MBL | 0.2351 | 5.3 | | 0.00 | | | | | | | | |
| 03 | DUP | 0.2354 | 5.3 | | 0.00 | | | | | | | | |
| 04 | DO | 0.2361 | 5.3 | | 0.00 | | | | | | | | |
| 05 | TRG | 0.2350 | 5.3 | | 0.00 | | | | | | | | |
| 06 | TRG | 0.2350 | 5.3 | | 0.00 | | | | | | | | |
| 07 | TRG | 0.2357 | 5.3 | | 0.00 | | | | | | | | |
| 08 | TRG | 0.2363 | 5.3 | | 0.00 | | | | | | | | |
| 09 | MSO | 0.2350 | 5.3 | | 0.00 | | | | | | | | |
| 10 | MS | 0.2344 | 5.3 | | 0.00 | | | | | | | | |
| 11 | MSD | 0.2355 | 5.3 | | 0.00 | | | | | | | | |
| 12 | TRG | 0.2349 | 5.3 | | 0.00 | | | | | | | | |
| 13 | TRG | 0.2343 | 5.3 | | 0.00 | | | | | | | | |
| 14 | TRG | 0.2344 | 5.3 | | 0.00 | | | | | | | | |
| 15 | TRG | 0.2344 | 5.3 | | 0.00 | | | | | | | | |
| 16 | TRG | 0.2346 | 5.3 | | 0.00 | | | | | | | | |
| 17 | TRG | 0.2354 | 5.3 | | 0.00 | | | | | | | | |
| 18 | TRG | 0.2346 | 5.3 | | 0.00 | | | | | | | | |
| 19 | TRG | 0.2338 | 5.3 | | 0.00 | | | | | | | | |
| 20 | TRG | 0.2337 | 5.2 | | 0.00 | | | | | | | | |

0201

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

# 17-07087
## ThISO
Run 1



| Internal Fraction | Sample Desc | Rough Prep Date | Rough Prep By | Prep Date | Prep By | Sep t0 Date/Time | Sep t0 By | Sep t1 Date/Time | Sep t1 By |
|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | | | 08/14/17 06:08 | JHARVEY | | | | |
| 02 | MBL | | | 08/14/17 06:08 | JHARVEY | | | | |
| 03 | DUP | | | 08/14/17 06:08 | JHARVEY | | | | |
| 04 | DO | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 05 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 06 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 07 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 08 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 09 | MSO | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 10 | MS | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 11 | MSD | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 12 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 13 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 14 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 15 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 16 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 17 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 18 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 19 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |
| 20 | TRG | 08/01/17 07:24 | KSALLINGS | 08/14/17 06:08 | JHARVEY | | | | |

0202

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Preliminary Data Report & Analytical Calculations

# Work Order: 17-07087-ThISO-1



Client: Weston Solutions, Inc.
Eberline Analytical Work Order: 17-07087
Analysis Code: ThISO
Run: 1

| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LCS Known | LCS %R | LCS Flag | RPD Flag | MDA Flag | Blank Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-228 | LCS | LCS | pCi/g | 5.85E+00 | 9.19E-01 | 9.78E-02 | 4.82E+00 | 121.38 | OK | | OK | |
| 02 | TH-228 | MBL | BLANK | pCi/g | 1.31E-02 | 3.15E-02 | 6.59E-02 | | | | | OK | OK |
| 03 | TH-228 | DUP | HTC-A03-S002-0006-01 | pCi/g | 5.19E-01 | 2.12E-01 | 1.03E-01 | | | | INV | OK | |
| 04 | TH-228 | DO | HTC-A03-S002-0006-01 | pCi/g | 3.81E-01 | 1.74E-01 | 1.05E-01 | | | | | OK | |
| 05 | TH-228 | TRG | HTC-A03-S002-0612-01 | pCi/g | 5.69E-01 | 2.37E-01 | 1.30E-01 | | | | | OK | |
| 06 | TH-228 | TRG | HTC-A03-S002-1218-01 | pCi/g | 1.01E+00 | 2.93E-01 | 9.47E-02 | | | | | OK | |
| 07 | TH-228 | TRG | HTC-A03-S002-1824-01 | pCi/g | 1.30E+00 | 3.65E-01 | 9.86E-02 | | | | | OK | |
| 08 | TH-228 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.21E+00 | 3.35E-01 | 1.18E-01 | | | | | OK | |
| 09 | TH-228 | MSO | HTC-A03-S002-3036-01 | pCi/g | 5.81E-01 | 2.25E-01 | 1.13E-01 | | | | | OK | |
| 10 | TH-228 | MS | HTC-A03-S002-3036-01 | pCi/g | 7.12E+00 | 1.23E+00 | 1.00E-01 | | | | | OK | |
| 11 | TH-228 | MSD | HTC-A03-S002-3036-01 MSD | pCi/g | 8.01E+00 | 1.50E+00 | 7.89E-02 | | | | | OK | |
| 12 | TH-228 | TRG | HTC-A03-S002-3036-02 | pCi/g | 7.13E-01 | 2.20E-01 | 9.14E-02 | | | | | OK | |
| 13 | TH-228 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.63E+00 | 4.28E-01 | 1.16E-01 | | | | | OK | |
| 14 | TH-228 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.16E+00 | 3.36E-01 | 7.24E-02 | | | | | OK | |
| 15 | TH-228 | TRG | HTC-A03-S003-0006-01 | pCi/g | 8.55E-01 | 2.79E-01 | 1.02E-01 | | | | | OK | |
| 16 | TH-228 | TRG | HTC-A03-S003-0612-01 | pCi/g | 7.07E-01 | 2.26E-01 | 7.21E-02 | | | | | OK | |
| 17 | TH-228 | TRG | HTC-A03-S003-1218-01 | pCi/g | 1.18E+00 | 3.47E-01 | 1.45E-01 | | | | | OK | |
| 18 | TH-228 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.38E+00 | 4.12E-01 | 8.83E-02 | | | | | OK | |
| 19 | TH-228 | TRG | HTC-A03-S003-2430-01 | pCi/g | 5.52E-01 | 1.78E-01 | 6.86E-02 | | | | | OK | |
| 20 | TH-228 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.47E+00 | 4.69E-01 | 1.78E-01 | | | | | OK | |

0203

# Work Order: 17-07087-ThISO-1



Run: 1
Analysis Code: ThISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
0204

| Lab Fraction | Nuclide | Sample Desc | Sample Date | Sample Aliquot | Radiometric % Rec | Grav % Rec | Mean % Rec | SAF | Sep t0 Date/Time | Sep t1 Date/Time |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-228 | LCS | 07/19/17 00:00 | 1.00E+00 | 116.63 | 0.00 | 0.00 | | | |
| 02 | TH-228 | MBL | 07/19/17 00:00 | 1.00E+00 | 101.96 | 0.00 | 0.00 | | | |
| 03 | TH-228 | DUP | 05/15/17 09:39 | 1.22E+00 | 83.76 | 0.00 | 0.00 | | | |
| 04 | TH-228 | DO | 05/15/17 09:39 | 1.21E+00 | 82.13 | 0.00 | 0.00 | | | |
| 05 | TH-228 | TRG | 05/15/17 09:36 | 1.04E+00 | 96.60 | 0.00 | 0.00 | | | |
| 06 | TH-228 | TRG | 05/15/17 09:33 | 1.59E+00 | 89.98 | 0.00 | 0.00 | | | |
| 07 | TH-228 | TRG | 05/15/17 09:27 | 1.06E+00 | 108.71 | 0.00 | 0.00 | | | |
| 08 | TH-228 | TRG | 05/15/17 09:24 | 1.26E+00 | 89.36 | 0.00 | 0.00 | | | |
| 09 | TH-228 | MSO | 05/15/17 09:21 | 1.08E+00 | 86.97 | 0.00 | 0.00 | | | |
| 10 | TH-228 | MS | 05/15/17 09:39 | 1.06E+00 | 117.82 | 0.00 | 0.00 | | | |
| 11 | TH-228 | MSD | 05/15/17 09:21 | 1.09E+00 | 99.68 | 0.00 | 0.00 | | | |
| 12 | TH-228 | TRG | 05/15/17 09:21 | 1.22E+00 | 114.29 | 0.00 | 0.00 | | | |
| 13 | TH-228 | TRG | 05/15/17 09:18 | 1.19E+00 | 91.22 | 0.00 | 0.00 | | | |
| 14 | TH-228 | TRG | 05/15/17 09:15 | 1.32E+00 | 90.31 | 0.00 | 0.00 | | | |
| 15 | TH-228 | TRG | 05/15/17 08:48 | 1.21E+00 | 91.78 | 0.00 | 0.00 | | | |
| 16 | TH-228 | TRG | 05/15/17 08:45 | 1.48E+00 | 104.01 | 0.00 | 0.00 | | | |
| 17 | TH-228 | TRG | 05/15/17 08:42 | 1.13E+00 | 111.44 | 0.00 | 0.00 | | | |
| 18 | TH-228 | TRG | 05/15/17 08:39 | 1.25E+00 | 73.04 | 0.00 | 0.00 | | | |
| 19 | TH-228 | TRG | 05/15/17 08:36 | 1.12E+00 | 150.65 | 0.00 | 0.00 | | | |
| 20 | TH-228 | TRG | 05/15/17 08:33 | 1.22E+00 | 81.11 | 0.00 | 0.00 | | | |

Preliminary Data Report & Analytical Calculations

# Work Order: 17-07087-ThISO-1



Run: 1
Analysis Code: ThISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
0205

| Lab Fraction | Nuclide | Sample Desc | Counting Date/Time | Halflife (days) | Detect | Carrier | Count Time | Counts | Bkg CPM | Eff |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-228 | LCS | 08/23/17 11:34 | | A_Spec | Alpha_056 | 170 | 4.11 E+02 | 8.00 E-03 | 15.9 |
| 02 | TH-228 | MBL | 08/23/17 11:33 | | A_Spec | Alpha_057 | 170 | 8.30 E-01 | 1.00 E-03 | 16.5 |
| 03 | TH-228 | DUP | 08/23/17 11:33 | | A_Spec | Alpha_058 | 170 | 3.01 E+01 | 5.00 E-03 | 16.6 |
| 04 | TH-228 | DO | 08/23/17 11:34 | | A_Spec | Alpha_059 | 170 | 2.30 E+01 | 6.00 E-03 | 17.8 |
| 05 | TH-228 | TRG | 08/23/17 11:34 | | A_Spec | Alpha_060 | 170 | 2.88 E+01 | 7.00 E-03 | 14.8 |
| 06 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_037 | 170 | 7.83 E+01 | 1.00 E-02 | 15.9 |
| 07 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_038 | 170 | 7.92 E+01 | 5.00 E-03 | 15.4 |
| 08 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_039 | 170 | 8.64 E+01 | 1.50 E-02 | 18.5 |
| 09 | TH-228 | MSO | 08/23/17 14:32 | | A_Spec | Alpha_040 | 170 | 3.38 E+01 | 7.00 E-03 | 18.1 |
| 10 | TH-228 | MS | 08/23/17 14:32 | | A_Spec | Alpha_043 | 170 | 5.69 E+02 | 1.30 E-02 | 18.7 |
| 11 | TH-228 | MSD | 08/23/17 14:32 | | A_Spec | Alpha_044 | 170 | 5.32 E+02 | 3.00 E-03 | 17.9 |
| 12 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_045 | 170 | 5.73 E+01 | 1.00 E-02 | 16.9 |
| 13 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_046 | 170 | 1.03 E+02 | 1.00 E-02 | 17.1 |
| 14 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_047 | 170 | 7.67 E+01 | 2.00 E-03 | 16.2 |
| 15 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_048 | 170 | 5.30 E+01 | 6.00 E-03 | 16.3 |
| 16 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_049 | 170 | 5.53 E+01 | 4.00 E-03 | 14.9 |
| 17 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_050 | 170 | 7.29 E+01 | 1.80 E-02 | 14.3 |
| 18 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_052 | 170 | 7.47 E+01 | 2.00 E-03 | 17.4 |
| 19 | TH-228 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_053 | 170 | 4.82 E+01 | 5.00 E-03 | 15.1 |
| 20 | TH-228 | TRG | 08/23/17 14:33 | | A_Spec | Alpha_054 | 170 | 6.76 E+01 | 1.40 E-02 | 13.6 |

Preliminary Data Report & Analytical Calculations

# Work Order: 17-07087-ThISO-1



Run: 1
Analysis Code: ThISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
0206

| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LCS Known | LCS %R | LCS Flag | RPD Flag | MDA Flag | Blank Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-230 | LCS | LCS | pCi/g | 6.25E+00 | 9.69E-01 | 9.40E-02 | 5.39E+00 | 115.82 | OK | | OK | |
| 02 | TH-230 | MBL | BLANK | pCi/g | 7.64E-02 | 7.07E-02 | 6.60E-02 | | | | | OK | OK |
| 03 | TH-230 | DUP | HTC-A03-S002-0006-01 | pCi/g | 4.76E-01 | 1.92E-01 | 8.19E-02 | | | | OK | OK | |
| 04 | TH-230 | DO | HTC-A03-S002-0006-01 | pCi/g | 4.31E-01 | 1.77E-01 | 7.19E-02 | | | | | OK | |
| 05 | TH-230 | TRG | HTC-A03-S002-0612-01 | pCi/g | 6.50E-01 | 2.48E-01 | 1.31E-01 | | | | | OK | |
| 06 | TH-230 | TRG | HTC-A03-S002-1218-01 | pCi/g | 1.81E+00 | 4.38E-01 | 6.13E-02 | | | | | OK | |
| 07 | TH-230 | TRG | HTC-A03-S002-1824-01 | pCi/g | 1.07E+00 | 3.10E-01 | 8.95E-02 | | | | | OK | |
| 08 | TH-230 | TRG | HTC-A03-S002-2430-01 | pCi/g | 9.52E-01 | 2.73E-01 | 8.39E-02 | | | | | OK | |
| 09 | TH-230 | MSO | HTC-A03-S002-3036-01 | pCi/g | 5.56E-01 | 2.08E-01 | 7.45E-02 | | | | | OK | |
| 10 | TH-230 | MS | HTC-A03-S002-3036-01 | pCi/g | 5.71E+00 | 1.00E+00 | 7.14E-02 | | | | | OK | |
| 11 | TH-230 | MSD | HTC-A03-S002-3036-01 MSD | pCi/g | 6.09E+00 | 1.16E+00 | 5.69E-02 | | | | | OK | |
| 12 | TH-230 | TRG | HTC-A03-S002-3036-02 | pCi/g | 6.50E-01 | 2.00E-01 | 7.73E-02 | | | | | OK | |
| 13 | TH-230 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.12E+00 | 3.20E-01 | 1.01E-01 | | | | | OK | |
| 14 | TH-230 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.16E+00 | 3.26E-01 | 6.56E-02 | | | | | OK | |
| 15 | TH-230 | TRG | HTC-A03-S003-0006-01 | pCi/g | 8.58E-01 | 2.69E-01 | 7.00E-02 | | | | | OK | |
| 16 | TH-230 | TRG | HTC-A03-S003-0612-01 | pCi/g | 8.19E-01 | 2.40E-01 | 5.54E-02 | | | | | OK | |
| 17 | TH-230 | TRG | HTC-A03-S003-1218-01 | pCi/g | 2.39E+00 | 5.59E-01 | 1.11E-01 | | | | | OK | |
| 18 | TH-230 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.13E+00 | 3.51E-01 | 1.10E-01 | | | | | OK | |
| 19 | TH-230 | TRG | HTC-A03-S003-2430-01 | pCi/g | 5.62E-01 | 1.73E-01 | 6.22E-02 | | | | | OK | |
| 20 | TH-230 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.01E+00 | 3.48E-01 | 1.18E-01 | | | | | OK | |

Preliminary Data Report & Analytical Calculations

# Work Order: 17-07087-ThISO-1



Run: 1
Analysis Code: ThISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
0207

| Lab Fraction | Nuclide | Sample Desc | Sample Date | Sample Aliquot | Radiometric % Rec | Grav % Rec | Mean % Rec | SAF | Sep t0 Date/Time | Sep t1 Date/Time |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-230 | LCS | 07/19/17 00:00 | 1.00E+00 | 116.63 | 0.00 | 0.00 | | | |
| 02 | TH-230 | MBL | 07/19/17 00:00 | 1.00E+00 | 101.96 | 0.00 | 0.00 | | | |
| 03 | TH-230 | DUP | 05/15/17 09:39 | 1.22E+00 | 83.76 | 0.00 | 0.00 | | | |
| 04 | TH-230 | DO | 05/15/17 09:39 | 1.21E+00 | 82.13 | 0.00 | 0.00 | | | |
| 05 | TH-230 | TRG | 05/15/17 09:36 | 1.04E+00 | 96.60 | 0.00 | 0.00 | | | |
| 06 | TH-230 | TRG | 05/15/17 09:33 | 1.59E+00 | 89.98 | 0.00 | 0.00 | | | |
| 07 | TH-230 | TRG | 05/15/17 09:27 | 1.06E+00 | 108.71 | 0.00 | 0.00 | | | |
| 08 | TH-230 | TRG | 05/15/17 09:24 | 1.26E+00 | 89.36 | 0.00 | 0.00 | | | |
| 09 | TH-230 | MSO | 05/15/17 09:21 | 1.08E+00 | 86.97 | 0.00 | 0.00 | | | |
| 10 | TH-230 | MS | 05/15/17 09:39 | 1.06E+00 | 117.82 | 0.00 | 0.00 | | | |
| 11 | TH-230 | MSD | 05/15/17 09:21 | 1.09E+00 | 99.68 | 0.00 | 0.00 | | | |
| 12 | TH-230 | TRG | 05/15/17 09:21 | 1.22E+00 | 114.29 | 0.00 | 0.00 | | | |
| 13 | TH-230 | TRG | 05/15/17 09:18 | 1.19E+00 | 91.22 | 0.00 | 0.00 | | | |
| 14 | TH-230 | TRG | 05/15/17 09:15 | 1.32E+00 | 90.31 | 0.00 | 0.00 | | | |
| 15 | TH-230 | TRG | 05/15/17 08:48 | 1.21E+00 | 91.78 | 0.00 | 0.00 | | | |
| 16 | TH-230 | TRG | 05/15/17 08:45 | 1.48E+00 | 104.01 | 0.00 | 0.00 | | | |
| 17 | TH-230 | TRG | 05/15/17 08:42 | 1.13E+00 | 111.44 | 0.00 | 0.00 | | | |
| 18 | TH-230 | TRG | 05/15/17 08:39 | 1.25E+00 | 73.04 | 0.00 | 0.00 | | | |
| 19 | TH-230 | TRG | 05/15/17 08:36 | 1.12E+00 | 150.65 | 0.00 | 0.00 | | | |
| 20 | TH-230 | TRG | 05/15/17 08:33 | 1.22E+00 | 81.11 | 0.00 | 0.00 | | | |

# Preliminary Data Report & Analytical Calculations
# Work Order: 17-07087-ThISO-1



Run: 1
Analysis Code: ThISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
0208

| Lab Fraction | Nuclide | Sample Desc | Counting Date/Time | Halflife (days) | Detect | Carrier | Count Time | Counts | Bkg CPM | Eff |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-230 | LCS | 08/23/17 11:34 | | A_Spec | Alpha_056 | 170 | 4.38 E+02 | 7.00 E-03 | 15.9 |
| 02 | TH-230 | MBL | 08/23/17 11:33 | | A_Spec | Alpha_057 | 170 | 4.83 E+00 | 1.00 E-03 | 16.5 |
| 03 | TH-230 | DUP | 08/23/17 11:33 | | A_Spec | Alpha_058 | 170 | 3.05 E+01 | 3.00 E-03 | 16.6 |
| 04 | TH-230 | DO | 08/23/17 11:34 | | A_Spec | Alpha_059 | 170 | 2.87 E+01 | 2.00 E-03 | 17.8 |
| 05 | TH-230 | TRG | 08/23/17 11:34 | | A_Spec | Alpha_060 | 170 | 3.63 E+01 | 1.00 E-02 | 14.8 |
| 06 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_037 | 170 | 1.54 E+02 | 3.00 E-03 | 15.9 |
| 07 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_038 | 170 | 7.20 E+01 | 0.00 E+00 | 15.4 |
| 08 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_039 | 170 | 7.48 E+01 | 7.00 E-03 | 18.5 |
| 09 | TH-230 | MSO | 08/23/17 14:32 | | A_Spec | Alpha_040 | 170 | 3.57 E+01 | 2.00 E-03 | 18.1 |
| 10 | TH-230 | MS | 08/23/17 14:32 | | A_Spec | Alpha_043 | 170 | 5.04 E+02 | 6.00 E-03 | 18.7 |
| 11 | TH-230 | MSD | 08/23/17 14:32 | | A_Spec | Alpha_044 | 170 | 4.47 E+02 | 1.00 E-03 | 17.9 |
| 12 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_045 | 170 | 5.76 E+01 | 8.00 E-03 | 16.9 |
| 13 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_046 | 170 | 7.85 E+01 | 9.00 E-03 | 17.1 |
| 14 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_047 | 170 | 8.47 E+01 | 2.00 E-03 | 16.2 |
| 15 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_048 | 170 | 5.87 E+01 | 2.00 E-03 | 16.3 |
| 16 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_049 | 170 | 7.07 E+01 | 2.00 E-03 | 14.9 |
| 17 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_050 | 170 | 1.62 E+02 | 1.10 E-02 | 14.3 |
| 18 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_052 | 170 | 6.78 E+01 | 7.00 E-03 | 17.4 |
| 19 | TH-230 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_053 | 170 | 5.42 E+01 | 5.00 E-03 | 15.1 |
| 20 | TH-230 | TRG | 08/23/17 14:33 | | A_Spec | Alpha_054 | 170 | 5.12 E+01 | 5.00 E-03 | 13.6 |

Preliminary Data Report & Analytical Calculations

# Work Order: 17-07087-ThISO-1



Run: 1
Analysis Code: ThISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
0209

| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LCS Known | LCS %R | LCS Flag | RPD Flag | MDA Flag | Blank Flag |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-232 | LCS | LCS | pCi/g | 5.79E+00 | 9.10E-01 | 8.04E-02 | 4.82E+00 | 120.01 | OK | | OK | |
| 02 | TH-232 | MBL | BLANK | pCi/g | 3.93E-02 | 5.48E-02 | 8.28E-02 | | | | | OK | OK |
| 03 | TH-232 | DUP | HTC-A03-S002-0006-01 | pCi/g | 3.03E-01 | 1.52E-01 | 1.11E-01 | | | | INV | OK | |
| 04 | TH-232 | DO | HTC-A03-S002-0006-01 | pCi/g | 4.33E-01 | 1.77E-01 | 6.26E-02 | | | | | OK | |
| 05 | TH-232 | TRG | HTC-A03-S002-0612-01 | pCi/g | 6.58E-01 | 2.45E-01 | 7.45E-02 | | | | | OK | |
| 06 | TH-232 | TRG | HTC-A03-S002-1218-01 | pCi/g | 7.95E-01 | 2.40E-01 | 6.98E-02 | | | | | OK | |
| 07 | TH-232 | TRG | HTC-A03-S002-1824-01 | pCi/g | 9.71E-01 | 2.90E-01 | 8.92E-02 | | | | | OK | |
| 08 | TH-232 | TRG | HTC-A03-S002-2430-01 | pCi/g | 9.04E-01 | 2.63E-01 | 7.61E-02 | | | | | OK | |
| 09 | TH-232 | MSO | HTC-A03-S002-3036-01 | pCi/g | 4.87E-01 | 1.93E-01 | 8.77E-02 | | | | | OK | |
| 10 | TH-232 | MS | HTC-A03-S002-3036-01 | pCi/g | 6.01E+00 | 1.05E+00 | 6.79E-02 | | | | | OK | |
| 11 | TH-232 | MSD | HTC-A03-S002-3036-01 MSD | pCi/g | 6.77E+00 | 1.27E+00 | 5.68E-02 | | | | | OK | |
| 12 | TH-232 | TRG | HTC-A03-S002-3036-02 | pCi/g | 6.94E-01 | 2.08E-01 | 7.72E-02 | | | | | OK | |
| 13 | TH-232 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.13E+00 | 3.22E-01 | 9.77E-02 | | | | | OK | |
| 14 | TH-232 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.26E+00 | 3.45E-01 | 5.72E-02 | | | | | OK | |
| 15 | TH-232 | TRG | HTC-A03-S003-0006-01 | pCi/g | 9.20E-01 | 2.83E-01 | 9.20E-02 | | | | | OK | |
| 16 | TH-232 | TRG | HTC-A03-S003-0612-01 | pCi/g | 8.25E-01 | 2.42E-01 | 6.52E-02 | | | | | OK | |
| 17 | TH-232 | TRG | HTC-A03-S003-1218-01 | pCi/g | 1.47E+00 | 3.88E-01 | 9.25E-02 | | | | | OK | |
| 18 | TH-232 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.03E+00 | 3.26E-01 | 8.77E-02 | | | | | OK | |
| 19 | TH-232 | TRG | HTC-A03-S003-2430-01 | pCi/g | 9.40E-01 | 2.40E-01 | 4.96E-02 | | | | | OK | |
| 20 | TH-232 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.07E+00 | 3.62E-01 | 9.39E-02 | | | | | OK | |

Preliminary Data Report & Analytical Calculations

# Work Order: 17-07087-ThISO-1



Run: 1
Analysis Code: ThISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
0210

| Lab Fraction | Nuclide | Sample Desc | Sample Date | Sample Aliquot | Radiometric % Rec | Grav % Rec | Mean % Rec | SAF | Sep t0 Date/Time | Sep t1 Date/Time |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-232 | LCS | 07/19/17 00:00 | 1.00E+00 | 116.63 | 0.00 | 0.00 | | | |
| 02 | TH-232 | MBL | 07/19/17 00:00 | 1.00E+00 | 101.96 | 0.00 | 0.00 | | | |
| 03 | TH-232 | DUP | 05/15/17 09:39 | 1.22E+00 | 83.76 | 0.00 | 0.00 | | | |
| 04 | TH-232 | DO | 05/15/17 09:39 | 1.21E+00 | 82.13 | 0.00 | 0.00 | | | |
| 05 | TH-232 | TRG | 05/15/17 09:36 | 1.04E+00 | 96.60 | 0.00 | 0.00 | | | |
| 06 | TH-232 | TRG | 05/15/17 09:33 | 1.59E+00 | 89.98 | 0.00 | 0.00 | | | |
| 07 | TH-232 | TRG | 05/15/17 09:27 | 1.06E+00 | 108.71 | 0.00 | 0.00 | | | |
| 08 | TH-232 | TRG | 05/15/17 09:24 | 1.26E+00 | 89.36 | 0.00 | 0.00 | | | |
| 09 | TH-232 | MSO | 05/15/17 09:21 | 1.08E+00 | 86.97 | 0.00 | 0.00 | | | |
| 10 | TH-232 | MS | 05/15/17 09:39 | 1.06E+00 | 117.82 | 0.00 | 0.00 | | | |
| 11 | TH-232 | MSD | 05/15/17 09:21 | 1.09E+00 | 99.68 | 0.00 | 0.00 | | | |
| 12 | TH-232 | TRG | 05/15/17 09:21 | 1.22E+00 | 114.29 | 0.00 | 0.00 | | | |
| 13 | TH-232 | TRG | 05/15/17 09:18 | 1.19E+00 | 91.22 | 0.00 | 0.00 | | | |
| 14 | TH-232 | TRG | 05/15/17 09:15 | 1.32E+00 | 90.31 | 0.00 | 0.00 | | | |
| 15 | TH-232 | TRG | 05/15/17 08:48 | 1.21E+00 | 91.78 | 0.00 | 0.00 | | | |
| 16 | TH-232 | TRG | 05/15/17 08:45 | 1.48E+00 | 104.01 | 0.00 | 0.00 | | | |
| 17 | TH-232 | TRG | 05/15/17 08:42 | 1.13E+00 | 111.44 | 0.00 | 0.00 | | | |
| 18 | TH-232 | TRG | 05/15/17 08:39 | 1.25E+00 | 73.04 | 0.00 | 0.00 | | | |
| 19 | TH-232 | TRG | 05/15/17 08:36 | 1.12E+00 | 150.65 | 0.00 | 0.00 | | | |
| 20 | TH-232 | TRG | 05/15/17 08:33 | 1.22E+00 | 81.11 | 0.00 | 0.00 | | | |

Preliminary Data Report & Analytical Calculations

# Work Order: 17-07087-ThISO-1

Run: 1
Analysis Code: ThISO
Eberline Analytical Work Order: 17-07087
Client: Weston Solutions, Inc.
0211

| Lab Fraction | Nuclide | Sample Desc | Counting Date/Time | Halflife (days) | Detect | Carrier | Count Time | Counts | Bkg CPM | Eff |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | TH-232 | LCS | 08/23/17 11:34 | | A_Spec | Alpha_056 | 170 | 4.06 E+02 | 4.00 E-03 | 15.9 |
| 02 | TH-232 | MBL | 08/23/17 11:33 | | A_Spec | Alpha_057 | 170 | 2.49 E+00 | 3.00 E-03 | 16.5 |
| 03 | TH-232 | DUP | 08/23/17 11:33 | | A_Spec | Alpha_058 | 170 | 1.95 E+01 | 9.00 E-03 | 16.6 |
| 04 | TH-232 | DO | 08/23/17 11:34 | | A_Spec | Alpha_059 | 170 | 2.88 E+01 | 1.00 E-03 | 17.8 |
| 05 | TH-232 | TRG | 08/23/17 11:34 | | A_Spec | Alpha_060 | 170 | 3.68 E+01 | 1.00 E-03 | 14.8 |
| 06 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_037 | 170 | 6.82 E+01 | 5.00 E-03 | 15.9 |
| 07 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_038 | 170 | 6.52 E+01 | 5.00 E-03 | 15.4 |
| 08 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_039 | 170 | 7.12 E+01 | 5.00 E-03 | 18.5 |
| 09 | TH-232 | MSO | 08/23/17 14:32 | | A_Spec | Alpha_040 | 170 | 3.13 E+01 | 4.00 E-03 | 18.1 |
| 10 | TH-232 | MS | 08/23/17 14:32 | | A_Spec | Alpha_043 | 170 | 5.31 E+02 | 0.00 E+00 | 18.7 |
| 11 | TH-232 | MSD | 08/23/17 14:32 | | A_Spec | Alpha_044 | 170 | 4.98 E+02 | 1.00 E-03 | 17.9 |
| 12 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_045 | 170 | 6.16 E+01 | 8.00 E-03 | 16.9 |
| 13 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_046 | 170 | 7.96 E+01 | 8.00 E-03 | 17.1 |
| 14 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_047 | 170 | 9.18 E+01 | 1.00 E-03 | 16.2 |
| 15 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_048 | 170 | 6.30 E+01 | 6.00 E-03 | 16.3 |
| 16 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_049 | 170 | 7.13 E+01 | 4.00 E-03 | 14.9 |
| 17 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_050 | 170 | 1.00 E+02 | 6.00 E-03 | 14.3 |
| 18 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_052 | 170 | 6.15 E+01 | 3.00 E-03 | 17.4 |
| 19 | TH-232 | TRG | 08/23/17 14:32 | | A_Spec | Alpha_053 | 170 | 9.07 E+01 | 2.00 E-03 | 15.1 |
| 20 | TH-232 | TRG | 08/23/17 14:33 | | A_Spec | Alpha_054 | 170 | 5.47 E+01 | 2.00 E-03 | 13.6 |

**Count Room Report**
**Client: Weston Solutions, Inc.**

**17-07087-ThISO-1 (pCi/g) in SO**
**Tracer ID: Th-18a**

| Internal Fraction | Sample Desc | Client ID | Sample Date | Sample Aliquot | Tracer Aliquot (g) | Tracer ACT (dpm) | Radiometric Tracer (pCi) | Radiometric % Rec | SAF 1* | SAF 2* |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | LCS | 07/19/17 00:00 | 1.0000 | 0.4708 | 10.5742 | | 0.00 | | |
| 02 | MBL | BLANK | 07/19/17 00:00 | 1.0000 | 0.2351 | 5.2803 | | 0.00 | | |
| 03 | DUP | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 1.2200 | 0.2354 | 5.2871 | | 0.00 | | |
| 04 | DO | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 1.2100 | 0.2361 | 5.3028 | | 0.00 | | |
| 05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 1.0400 | 0.2350 | 5.2781 | | 0.00 | | |
| 06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 1.5900 | 0.2350 | 5.2781 | | 0.00 | | |
| 07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 1.0600 | 0.2357 | 5.2938 | | 0.00 | | |
| 08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 1.2600 | 0.2363 | 5.3073 | | 0.00 | | |
| 09 | MSO | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 1.0800 | 0.2350 | 5.2781 | | 0.00 | | |
| 10 | MS | HTC-A03-S002-3036-01 | 05/15/17 09:39 | 1.0600 | 0.2344 | 5.2646 | | 0.00 | | |
| 11 | MSD | HTC-A03-S002-3036-01 MSD | 05/15/17 09:21 | 1.0900 | 0.2355 | 5.2893 | | 0.00 | | |
| 12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 1.2200 | 0.2349 | 5.2759 | | 0.00 | | |
| 13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 1.1900 | 0.2343 | 5.2624 | | 0.00 | | |
| 14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 1.3200 | 0.2344 | 5.2646 | | 0.00 | | |
| 15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 1.2100 | 0.2344 | 5.2646 | | 0.00 | | |
| 16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 1.4800 | 0.2346 | 5.2691 | | 0.00 | | |
| 17 | TRG | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 1.1300 | 0.2354 | 5.2871 | | 0.00 | | |
| 18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 1.2500 | 0.2346 | 5.2691 | | 0.00 | | |
| 19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 1.1200 | 0.2338 | 5.2511 | | 0.00 | | |
| 20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 1.2200 | 0.2337 | 5.2489 | | 0.00 | | |

Eberline Analytical
Oak Ridge Laboratory

# Spike and Tracer Worksheet


Printed: 8/14/2017 6:08 AM

| Internal Work Order | Run | Analysis Code | Date | Technician | Technician Initials | Witness Initials |
|---|---|---|---|---|---|---|
| 17-07087 | 1 | ThISO | 8/14/2017 6:07 | JHARVEY | JH | |

| LCS & Matrix Spikes | | | | | LCS | MS | LCSD | MSD | LCS | | MS | | LCSD | | MSD | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Isotope | Sol # | Activity dpm/g | Solution Date | Approx Addition | Volume Used (g) | Volume Used (g) | Volume Used (g) | Volume Used (g) | Known pCi | Error Estimate | Added pCi | Error Estimate | Known pCi | Error Estimate | Added pCi | Error Estimate |
| Th-228 | Th-8b | 103.560 | 8/14/2017 | 0.100 | 0.1034 | 0.1038 | 0.1501 | ~~0.1035~~ | 4.82 | 0.174 | 4.84 | 0.174 | 0.00 | 0.000 | 4.83 | 0.174 |
| Th-230 | Th-1b | 23.520 | 8/14/2017 | 0.500 | 0.5092 | 0.5092 | | 0.5093 | 5.39 | 0.146 | 5.39 | 0.146 | 0.00 | 0.000 | 5.40 | 0.146 |
| Th-232 | Th-8b | 103.560 | 8/14/2017 | 0.100 | 0.1034 | 0.1038 | 0.1501 | ~~0.1035~~ | 4.82 | 0.174 | 4.84 | 0.174 | 0.00 | 0.000 | 4.83 | 0.174 |

| Tracers | | | | | | |
|---|---|---|---|---|---|---|
| fraction | Isotope | Sol # | Activity dpm/g | Solution Date | Volume Used (g) | Approx Addition |
| 01 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.4708 | 0.2200 |
| 02 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2351 | 0.2200 |
| 03 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2354 | 0.2200 |
| 04 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2361 | 0.2200 |
| 05 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2350 | 0.2200 |
| 06 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2350 | 0.2200 |
| 07 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2357 | 0.2200 |
| 08 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2363 | 0.2200 |
| 09 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2350 | 0.2200 |
| 10 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2344 | 0.2200 |
| 11 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2355 | 0.2200 |
| 12 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2349 | 0.2200 |
| 13 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2343 | 0.2200 |
| 14 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2344 | 0.2200 |
| 15 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2344 | 0.2200 |
| 16 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2346 | 0.2200 |
| 17 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2354 | 0.2200 |
| 18 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2346 | 0.2200 |
| 19 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2338 | 0.2200 |
| 20 | Th-229 | Th-18a | 22.460 | 8/14/2017 | 0.2337 | 0.2200 |

## Balance Printer Tapes

**Tracer**

0.4708 g
0.2351 g
0.2354 g
0.2361 g
0.2350 g
0.2350 g
0.2357 g
0.2363 g
0.2350 g
0.2344 g
0.2355 g
0.2349 g
0.2343 g
0.2344 g
0.2344 g
0.2346 g
0.2354 g
0.2346 g
0.2338 g
0.2337 g

**LCS**

0.5092 g

0.1034 g

**Matrix Spike**

0.5092 g

0.1038 g

0.5093 g

0.1501
~~0.1035~~ g

JH 8/14/17

0213

Eberline Analytical
Oak Ridge Laboratory

# Aliquot Worksheet



| Work Order | Run | Analysis Code | Rpt Units | Lab Deadline | Technician |
|---|---|---|---|---|---|
| 17-07087 | 1 | ThISO | grams | 8/10/2017 | JHARVEY |

| Lab Fraction | Weston Solutions, Inc. Client ID | Sample Type | Muffle Data | Dilution Data | | | Aliquot Data | | MS Aliquot Data | | H-3 Solids Only | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ratio Post/Pre | No of Dils | Dil Factor | Ratio | Aliquot | Net Equiv | Aliquot | Net Equiv | Water Added (ml) | H3 Dist Aliq |
| 01 | LCS | LCS | | | | 1.00E+00 | 1.0000E+00 | 1.0000E+00 | | | | |
| 02 | BLANK | MBL | | | | 1.00E+00 | 1.0000E+00 | 1.0000E+00 | | | | |
| 03 | HTC-A03-S002-0006-01 | DUP | | | | 1.00E+00 | 1.2200E+00 | 1.2200E+00 | | | | |
| 04 | HTC-A03-S002-0006-01 | DO | | | | 1.00E+00 | 1.2100E+00 | 1.2100E+00 | | | | |
| 05 | HTC-A03-S002-0612-01 | TRG | | | | 1.00E+00 | 1.0400E+00 | 1.0400E+00 | | | | |
| 06 | HTC-A03-S002-1218-01 | TRG | | | | 1.00E+00 | 1.5900E+00 | 1.5900E+00 | | | | |
| 07 | HTC-A03-S002-1824-01 | TRG | | | | 1.00E+00 | 1.0600E+00 | 1.0600E+00 | | | | |
| 08 | HTC-A03-S002-2430-01 | TRG | | | | 1.00E+00 | 1.2600E+00 | 1.2600E+00 | | | | |
| 09 | HTC-A03-S002-3036-01 | MSO | | | | 1.00E+00 | 1.0800E+00 | 1.0800E+00 | | | | |
| 10 | HTC-A03-S002-3036-01 MS | MS | | | | 1.00E+00 | 1.0600E+00 | 1.0600E+00 | | | | |
| 11 | HTC-A03-S002-3036-01 MSD | MSD | | | | 1.00E+00 | 1.0900E+00 | 1.0900E+00 | | | | |
| 12 | HTC-A03-S002-3036-02 | TRG | | | | 1.00E+00 | 1.2200E+00 | 1.2200E+00 | | | | |
| 13 | HTC-A03-S002-3642-01 | TRG | | | | 1.00E+00 | 1.1900E+00 | 1.1900E+00 | | | | |
| 14 | HTC-A03-S002-4248-01 | TRG | | | | 1.00E+00 | 1.3200E+00 | 1.3200E+00 | | | | |
| 15 | HTC-A03-S003-0006-01 | TRG | | | | 1.00E+00 | 1.2100E+00 | 1.2100E+00 | | | | |
| 16 | HTC-A03-S003-0612-01 | TRG | | | | 1.00E+00 | 1.4800E+00 | 1.4800E+00 | | | | |
| 17 | HTC-A03-S003-1218-01 | TRG | | | | 1.00E+00 | 1.1300E+00 | 1.1300E+00 | | | | |
| 18 | HTC-A03-S003-1824-01 | TRG | | | | 1.00E+00 | 1.2500E+00 | 1.2500E+00 | | | | |
| 19 | HTC-A03-S003-2430-01 | TRG | | | | 1.00E+00 | 1.1200E+00 | 1.1200E+00 | | | | |
| 20 | HTC-A03-S003-3036-01 | TRG | | | | 1.00E+00 | 1.2200E+00 | 1.2200E+00 | | | | |

| Comments | |
|---|---|

0214

Technician: JHarvey Date: 8/14/17

Eberline Services - Oak Ridge
Prep Logbook
Version 2.0 8/1999

# Rough Sample Preparation Log Book



| Work Order | Lab Deadline | Date Received in Prep | Date Sealed | Date Returned | Technician |
|---|---|---|---|---|---|
| 17-07087 | 8/10/2017 | 7/31/2017 | 8/1/2017 | 8/2/2017 | KSALLINGS |

**Bico Pulverizer:** 000302 [✓] Jaw Crusher 68275 [ ]

| Eberline Fraction | Weston Solutions, Inc. Client ID | Tare (g) | Gross (g) | | Net (g) | | Percent | | Gamma | | Special Info |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pan Wt | Wet Wt. | Dry Wt. | Wet Wt. | Dry Wt. | Liquid | Solid | Dry Wt. | LEPS Wt. | |
| 04 | HTC-A03-S002-0006-01 | 14.6400 | 1033.2200 | 900.0000 | 1018.5800 | 885.3600 | 13.08% | 86.92% | 0.0000 | 0.0000 | |
| 05 | HTC-A03-S002-0612-01 | 14.6200 | 985.7200 | 901.2600 | 971.1000 | 886.6400 | 8.70% | 91.30% | 0.0000 | 0.0000 | |
| 06 | HTC-A03-S002-1218-01 | 14.5900 | 1011.0600 | 869.2800 | 996.4700 | 854.6900 | 14.23% | 85.77% | 0.0000 | 0.0000 | |
| 07 | HTC-A03-S002-1824-01 | 14.6400 | 959.0000 | 786.5200 | 944.3600 | 771.8800 | 18.26% | 81.74% | 0.0000 | 0.0000 | |
| 08 | HTC-A03-S002-2430-01 | 14.6700 | 975.4000 | 778.3000 | 960.7300 | 763.6300 | 20.52% | 79.48% | 0.0000 | 0.0000 | |
| 09 | HTC-A03-S002-3036-01 | 14.6500 | 1039.9200 | 835.9600 | 1025.2700 | 821.3100 | 19.89% | 80.11% | 0.0000 | 0.0000 | |
| 10 | HTC-A03-S002-3036-01 MS | 14.6300 | 1041.0600 | 837.2200 | 1026.4300 | 822.5900 | 19.86% | 80.14% | 0.0000 | 0.0000 | |
| 11 | HTC-A03-S002-3036-01 MSD | 14.6300 | 1041.0600 | 837.2200 | 1026.4300 | 822.5900 | 19.86% | 80.14% | 0.0000 | 0.0000 | |
| 12 | HTC-A03-S002-3036-02 | 14.6100 | 1055.0000 | 849.4000 | 1040.3900 | 834.7900 | 19.76% | 80.24% | 0.0000 | 0.0000 | |
| 13 | HTC-A03-S002-3642-01 | 14.6200 | 1050.1600 | 852.9800 | 1035.5400 | 838.3600 | 19.04% | 80.96% | 0.0000 | 0.0000 | |
| 14 | HTC-A03-S002-4248-01 | 14.6000 | 1044.5000 | 851.5800 | 1029.9000 | 836.9800 | 18.73% | 81.27% | 0.0000 | 0.0000 | |
| 15 | HTC-A03-S003-0006-01 | 14.5200 | 948.8000 | 716.8200 | 934.2800 | 702.3000 | 24.83% | 75.17% | 0.0000 | 0.0000 | |
| 16 | HTC-A03-S003-0612-01 | 14.5100 | 997.5000 | 781.2900 | 982.9900 | 766.7800 | 22.00% | 78.00% | 0.0000 | 0.0000 | |
| 17 | HTC-A03-S003-1218-01 | 14.4900 | 1025.8600 | 819.9600 | 1011.3700 | 805.4700 | 20.36% | 79.64% | 0.0000 | 0.0000 | |
| 18 | HTC-A03-S003-1824-01 | 14.5300 | 1023.6600 | 832.7600 | 1009.1300 | 818.2300 | 18.92% | 81.08% | 0.0000 | 0.0000 | |
| 19 | HTC-A03-S003-2430-01 | 14.6300 | 916.4000 | 754.6300 | 901.7700 | 740.0000 | 17.94% | 82.06% | 0.0000 | 0.0000 | |
| 20 | HTC-A03-S003-3036-01 | 14.5400 | 925.6400 | 765.7600 | 911.1000 | 751.2200 | 17.55% | 82.45% | 0.0000 | 0.0000 | |

**OVENS** Fisher Isotemp SN 00579 [✓] VWR SN 000588 [ ]

| | |
|---|---|
| *Comments* | |
| *Special Codes* | **H: Hot, O: Organic Hazard, P: PCB Hazard, R: Rush, T: Other (see comments)** |

0215

Technician: Kerry Sallings

Date: **Analysis: Rough Prep Logbook**

**Analysis: ThISO Page No. 10174**

KB 8/23/17

# Apex-Alpha™

Sample Description: SPIKE
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 01
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_056
Chamber Serial Number: 10006124B
Detector Serial Number: 56
Env. Background: System Bkgd 194227
Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 gram
Sample Date/Time: 8/23/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 11:34:04 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.471 mL
Effective Efficiency: 0.1860 +/- 0.0117
Counting Efficiency: 0.1595 +/- 0.0027 on 11/18/2016 3:34:09 PM
Chem. Recovery Factor: 1.1663 +/- 0.0762

Control Certificate Name: NatTh_Th-8
Chem. Recov. of Control: TH-232 1.200081 +/- 0.102788
Peak Match Tolerance: 0.175 MeV

## PEAK AREA REPORT

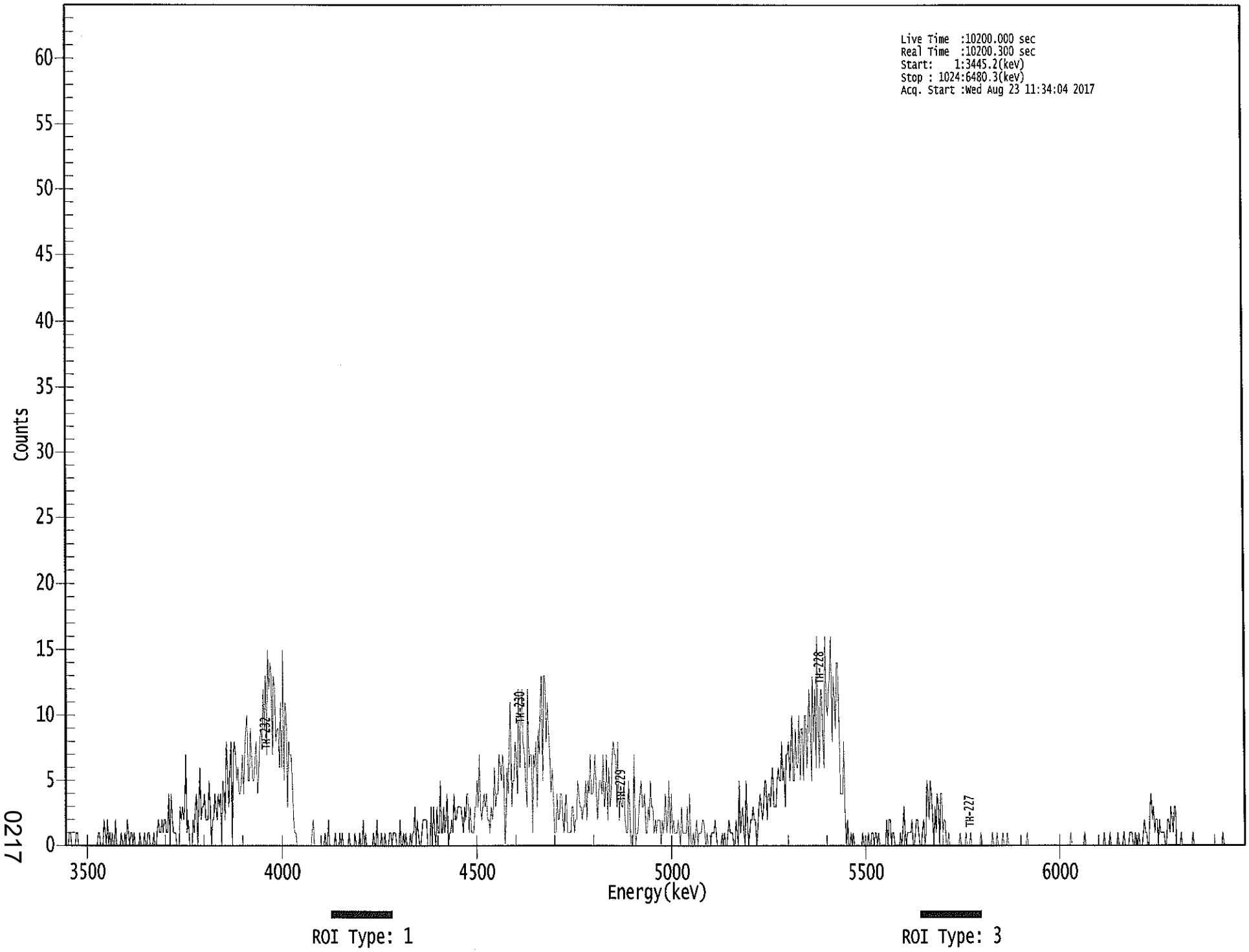
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.771 | 18.81 | 46.83 | 1.19 | 0.00E+000 | 3.0 |
| TH-228 | | 5.384 | 410.64 | 9.69 | 1.36 | 0.00E+000 | 6.3 |
| TH-229 | T | 4.874 | 334.30 | 10.75 | 1.70 | 0.00E+000 | 14.1 |
| TH-230 | | 4.614 | 437.81 | 9.38 | 1.19 | 0.00E+000 | 12.5 |
| TH-232 | | 3.961 | 406.32 | 9.73 | 0.68 | 0.00E+000 | 14.4 |

T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.968 | 5850.00* | 2.75E-001 +/- 1.33E-001 | 9.63E-002 +/- 1.19E-002 |
| TH-228 | 0.999 | 5400.00* | 5.85E+000 +/- 9.19E-001 | 9.78E-002 +/- 1.21E-002 |
| TH-229 | 1.000 | 4872.00* | 4.79E+000 +/- 5.91E-001 | 1.05E-001 +/- 1.30E-002 |
| TH-230 | 0.983 | 4672.00* | 6.25E+000 +/- 9.69E-001 | 9.40E-002 +/- 1.16E-002 |
| TH-232 | 0.993 | 3997.00* | 5.79E+000 +/- 9.10E-001 | 8.04E-002 +/- 9.92E-003 |

0000192425.CNF




0217

```
*****************************************************
*****   S P E C T R A L   D A T A   R E P O R T   *****
*****************************************************
```

Sample Title: 01

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 9: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 33: | 0 | 2 | 1 | 0 | 2 | 0 | 1 | 0 |
| 41: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 49: | 1 | 0 | 0 | 1 | 0 | 2 | 1 | 0 |
| 57: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 65: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 73: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 81: | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| 89: | 1 | 4 | 0 | 4 | 2 | 1 | 1 | 1 |
| 97: | 0 | 0 | 0 | 3 | 2 | 3 | 2 | 3 |
| 105: | 7 | 1 | 2 | 0 | 0 | 0 | 2 | 1 |
| 113: | 3 | 4 | 0 | 3 | 6 | 2 | 3 | 3 |
| 121: | 4 | 2 | 2 | 2 | 5 | 3 | 0 | 2 |
| 129: | 2 | 4 | 3 | 2 | 4 | 3 | 4 | 0 |
| 137: | 5 | 4 | 2 | 8 | 6 | 3 | 6 | 8 |
| 145: | 0 | 7 | 8 | 7 | 5 | 6 | 4 | 4 |
| 153: | 5 | 7 | 4 | 7 | 9 | 10 | 5 | 5 |
| 161: | 9 | 7 | 5 | 5 | 7 | 8 | 4 | 5 |
| 169: | 8 | 9 | 8 | 12 | 9 | 13 | 7 | 15 |
| 177: | 12 | 14 | 13 | 7 | 13 | 12 | 8 | 9 |
| 185: | 9 | 6 | 11 | 6 | 15 | 5 | 11 | 10 |
| 193: | 3 | 8 | 7 | 7 | 5 | 2 | 1 | 1 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 233: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 241: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 249: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 257: | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 |
| 273: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 281: | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| 289: | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 |
| 297: | 0 | 0 | 1 | 0 | 1 | 1 | 3 | 0 |
| 305: | 2 | 1 | 0 | 0 | 1 | 2 | 2 | 2 |
| 313: | 2 | 0 | 0 | 0 | 3 | 0 | 3 | 1 |
| 321: | 0 | 3 | 1 | 1 | 5 | 1 | 1 | 3 |
| 329: | 1 | 2 | 4 | 0 | 1 | 1 | 2 | 1 |
| 337: | 4 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| 345: | 1 | 3 | 2 | 4 | 4 | 1 | 3 | 1 |
| 353: | 1 | 1 | 3 | 3 | 5 | 3 | 7 | 3 |
| 361: | 2 | 3 | 4 | 3 | 4 | 2 | 2 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 3 | 2 | 3 | 6 | 3 | 4 | 4 | 7 |

Sample Title: 01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 6 | 5 | 7 | 6 | 0 | 2 | 6 | 4 |
| 385: | 8 | 11 | 3 | 5 | 5 | 8 | 7 | 4 |
| 393: | 12 | 6 | 9 | 12 | 8 | 7 | 5 | 3 |
| 401: | 12 | 6 | 7 | 7 | 1 | 7 | 6 | 8 |
| 409: | 3 | 9 | 7 | 11 | 13 | 5 | 13 | 13 |
| 417: | 8 | 11 | 9 | 7 | 4 | 6 | 4 | 1 |
| 425: | 1 | 4 | 2 | 2 | 4 | 4 | 2 | 1 |
| 433: | 3 | 4 | 1 | 1 | 1 | 1 | 3 | 3 |
| 441: | 1 | 2 | 2 | 5 | 4 | 3 | 3 | 2 |
| 449: | 3 | 3 | 5 | 2 | 5 | 4 | 7 | 4 |
| 457: | 4 | 5 | 7 | 4 | 2 | 4 | 5 | 5 |
| 465: | 4 | 7 | 3 | 4 | 7 | 2 | 6 | 3 |
| 473: | 4 | 7 | 8 | 7 | 7 | 3 | 8 | 2 |
| 481: | 4 | 3 | 3 | 5 | 2 | 1 | 1 | 5 |
| 489: | 3 | 0 | 0 | 1 | 7 | 0 | 1 | 1 |
| 497: | 3 | 4 | 5 | 3 | 3 | 4 | 1 | 1 |
| 505: | 3 | 2 | 5 | 3 | 3 | 1 | 2 | 1 |
| 513: | 2 | 2 | 2 | 0 | 2 | 1 | 2 | 4 |
| 521: | 1 | 2 | 5 | 1 | 4 | 1 | 2 | 1 |
| 529: | 1 | 1 | 2 | 1 | 0 | 3 | 1 | 1 |
| 537: | 1 | 1 | 3 | 0 | 4 | 0 | 0 | 1 |
| 545: | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 2 |
| 553: | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 561: | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 |
| 569: | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 1 |
| 577: | 1 | 1 | 0 | 0 | 2 | 1 | 0 | 5 |
| 585: | 1 | 2 | 3 | 1 | 0 | 5 | 2 | 0 |
| 593: | 1 | 2 | 2 | 3 | 2 | 2 | 0 | 1 |
| 601: | 3 | 4 | 3 | 2 | 3 | 5 | 5 | 2 |
| 609: | 4 | 4 | 3 | 5 | 6 | 3 | 3 | 3 |
| 617: | 5 | 6 | 5 | 5 | 8 | 5 | 6 | 3 |
| 625: | 7 | 7 | 8 | 5 | 7 | 10 | 5 | 5 |
| 633: | 9 | 6 | 6 | 10 | 5 | 9 | 9 | 5 |
| 641: | 10 | 10 | 6 | 9 | 12 | 9 | 5 | 13 |
| 649: | 8 | 12 | 6 | 16 | 9 | 6 | 12 | 12 |
| 657: | 8 | 6 | 16 | 11 | 10 | 12 | 13 | 16 |
| 665: | 8 | 13 | 11 | 9 | 14 | 14 | 10 | 4 |
| 673: | 4 | 4 | 8 | 2 | 0 | 2 | 0 | 0 |
| 681: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 697: | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 705: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 713: | 0 | 2 | 2 | 0 | 1 | 1 | 0 | 0 |
| 721: | 0 | 0 | 0 | 1 | 0 | 1 | 3 | 1 |
| 729: | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 0 |
| 737: | 1 | 2 | 2 | 1 | 0 | 0 | 1 | 2 |
| 745: | 0 | 1 | 5 | 4 | 2 | 5 | 4 | 2 |
| 753: | 0 | 3 | 1 | 4 | 3 | 0 | 4 | 4 |
| 761: | 1 | 2 | 2 | 0 | 0 | 1 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 777: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 785: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |

Sample Title: 01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 817: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 905: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 921: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| 929: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| 937: | 1 | 1 | 0 | 0 | 3 | 4 | 2 | 3 |
| 945: | 1 | 2 | 2 | 0 | 2 | 1 | 1 | 1 |
| 953: | 1 | 0 | 0 | 2 | 2 | 1 | 3 | 2 |
| 961: | 1 | 3 | 3 | 0 | 0 | 0 | 0 | 1 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

JCB 8/23/17

Sample Description: BLANK
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001923
Batch Identification: 1707087A-TH
Sample Identification: 02
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_057
Chamber Serial Number: 01017326A
Detector Serial Number: 57
Env. Background: System Bkgd 194228
Reagent Blank: <not performed>

Sample Size: 1.000E+000 +/- 0.000E+000 gram
Sample Date/Time: 8/23/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 11:33:56 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1679 +/- 0.0146
Counting Efficiency: 0.1646 +/- 0.0028 on 11/18/2016 3:34:08 PM
Chem. Recovery Factor: 1.0196 +/- 0.0907

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

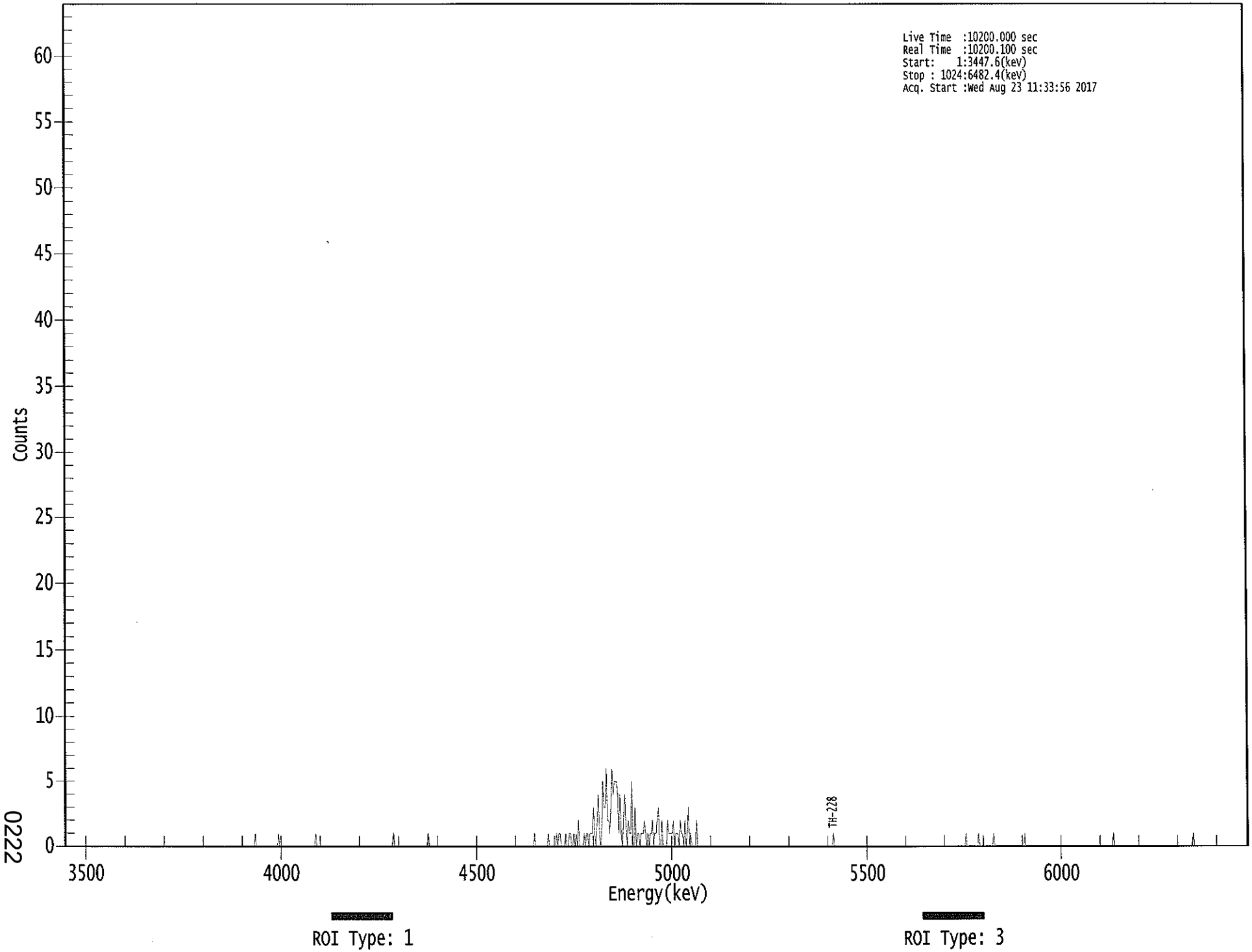
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.819 | 4.00 | 109.57 | 0.00 | 0.00E+000 | 3.0 |
| TH-228 | | 5.414 | 0.83 | 239.53 | 0.17 | 0.00E+000 | 3.0 |
| TH-229 | T | 4.885 | 150.66 | 15.99 | 0.34 | 0.00E+000 | 5.2 |
| TH-230 | | 4.693 | 4.83 | 91.00 | 0.17 | 0.00E+000 | 3.0 |
| TH-232 | | 4.005 | 2.49 | 138.29 | 0.51 | 0.00E+000 | 3.0 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.995 | 5850.00* | 6.48E-002 +/- 7.18E-002 | 9.71E-002 +/- 1.66E-002 |
| TH-228 | 0.999 | 5400.00* | 1.31E-002 +/- 3.15E-002 | 6.59E-002 +/- 1.13E-002 |
| TH-229 | 0.999 | 4872.00* | 2.39E+000 +/- 4.09E-001 | 7.58E-002 +/- 1.30E-002 |
| TH-230 | 0.998 | 4672.00* | 7.64E-002 +/- 7.07E-002 | 6.60E-002 +/- 1.13E-002 |
| TH-232 | 1.000 | 3997.00* | 3.93E-002 +/- 5.48E-002 | 8.28E-002 +/- 1.42E-002 |

0000192372.CNF




0222

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 02

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 185: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 02

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 401: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 417: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 425: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 433: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 441: | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| 449: | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| 457: | 3 | 1 | 0 | 2 | 4 | 1 | 0 | 1 |
| 465: | 5 | 3 | 3 | 6 | 2 | 2 | 1 | 3 |
| 473: | 6 | 4 | 5 | 5 | 5 | 4 | 1 | 4 |
| 481: | 1 | 0 | 2 | 4 | 2 | 0 | 2 | 1 |
| 489: | 1 | 5 | 0 | 0 | 3 | 0 | 1 | 1 |
| 497: | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 |
| 505: | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 513: | 3 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 521: | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 |
| 529: | 1 | 1 | 0 | 2 | 1 | 1 | 0 | 2 |
| 537: | 0 | 1 | 3 | 0 | 1 | 0 | 0 | 0 |
| 545: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 02

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

NLB 8/23/12

Sample Description: HTC-A03-S002-0006-01-DUP
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001923
Batch Identification: 1707087A-TH
Sample Identification: 03
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_058
Chamber Serial Number: 01017326B
Detector Serial Number: 58
Env. Background: System Bkgd 194229
Reagent Blank: <not performed>

Sample Size: 1.220E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 11:33:58 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1394 +/- 0.0132
Counting Efficiency: 0.1665 +/- 0.0028 on 11/18/2016 3:34:06 PM
Chem. Recovery Factor: 0.8376 +/- 0.0807

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

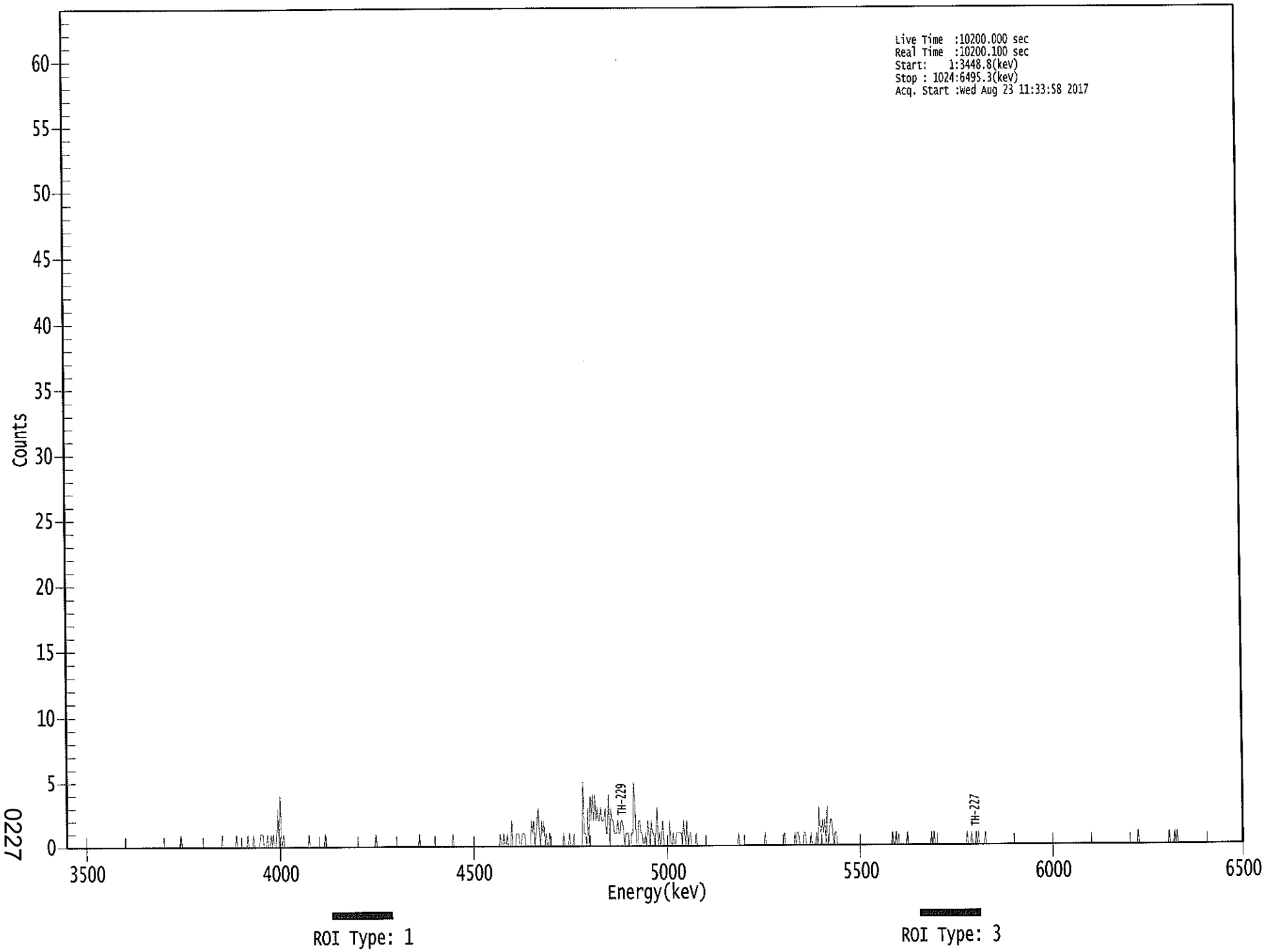
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.800 | 4.66 | 94.59 | 0.34 | 0.00E+000 | 3.0 |
| TH-228 | | 5.384 | 30.15 | 36.28 | 0.85 | 0.00E+000 | 3.7 |
| TH-229 | T | 4.885 | 125.32 | 17.56 | 0.68 | 0.00E+000 | 3.4 |
| TH-230 | | 4.639 | 30.49 | 35.84 | 0.51 | 0.00E+000 | 6.7 |
| TH-232 | | 3.972 | 19.47 | 46.42 | 1.53 | 0.00E+000 | 3.5 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.987 | 5850.00* | 7.51E-002 +/- 7.24E-002 | 7.70E-002 +/- 1.43E-002 |
| TH-228 | 0.998 | 5400.00* | 5.19E-001 +/- 2.12E-001 | 1.03E-001 +/- 1.92E-002 |
| TH-229 | 0.999 | 4872.00* | 1.96E+000 +/- 3.65E-001 | 8.83E-002 +/- 1.64E-002 |
| TH-230 | 0.994 | 4672.00* | 4.76E-001 +/- 1.92E-001 | 8.19E-002 +/- 1.52E-002 |
| TH-232 | 0.997 | 3997.00* | 3.03E-001 +/- 1.52E-001 | 1.11E-001 +/- 2.06E-002 |

0000192375.CNF




0227

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 03

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 161: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 169: | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 177: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 3 |
| 185: | 0 | 4 | 1 | 0 | 1 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 03

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 385: | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 |
| 393: | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 401: | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 1 |
| 409: | 2 | 3 | 1 | 0 | 2 | 1 | 2 | 0 |
| 417: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 425: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 433: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 441: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 449: | 5 | 1 | 1 | 0 | 3 | 0 | 4 | 2 |
| 457: | 4 | 2 | 4 | 2 | 3 | 2 | 2 | 3 |
| 465: | 2 | 2 | 2 | 3 | 1 | 1 | 4 | 0 |
| 473: | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 1 |
| 481: | 1 | 2 | 2 | 1 | 0 | 1 | 1 | 1 |
| 489: | 0 | 0 | 1 | 1 | 5 | 3 | 0 | 0 |
| 497: | 2 | 2 | 1 | 1 | 0 | 0 | 1 | 0 |
| 505: | 2 | 1 | 0 | 2 | 1 | 1 | 0 | 1 |
| 513: | 3 | 0 | 1 | 0 | 1 | 2 | 0 | 0 |
| 521: | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| 529: | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 2 |
| 537: | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 0 |
| 545: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 641: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 649: | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 1 |
| 657: | 2 | 1 | 2 | 0 | 3 | 0 | 1 | 2 |
| 665: | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 721: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 753: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 785: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 793: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 03

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 961: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

TCB 8/23/17

# Apex-Alpha™

Sample Description: HTC-A03-S002-0006-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001923
Batch Identification: 1707087A-TH
Sample Identification: 04
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_059
Chamber Serial Number: 10006125A
Detector Serial Number: 59
Env. Background: System Bkgd 194230
Reagent Blank: <not performed>

Sample Size: 1.210E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 11:34:00 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.236 mL
Effective Efficiency: 0.1459 +/- 0.0135
Counting Efficiency: 0.1776 +/- 0.0030 on 11/18/2016 3:40:57 PM
Chem. Recovery Factor: 0.8213 +/- 0.0774

Peak Match Tolerance: 0.175 MeV

## PEAK AREA REPORT

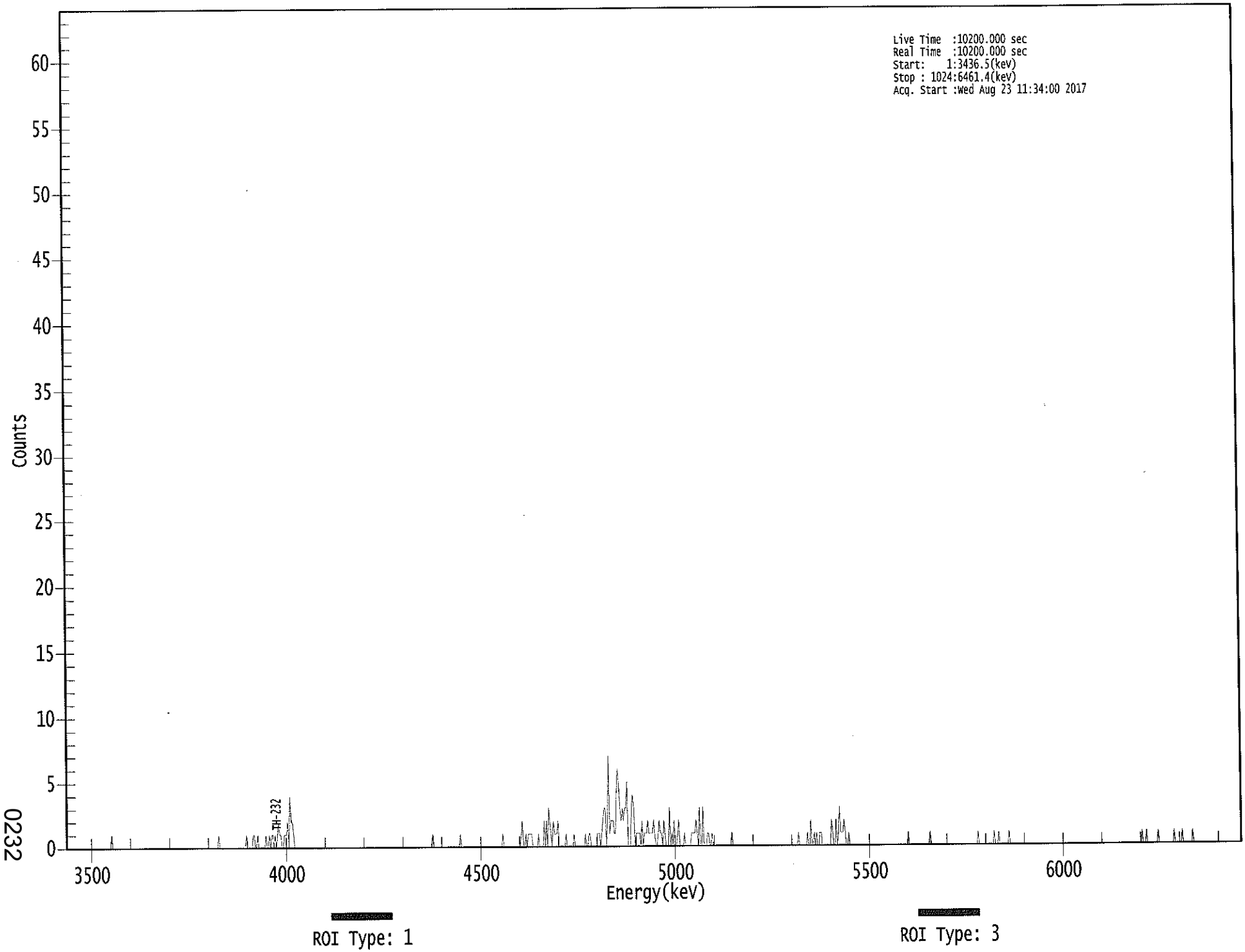
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.825 | 3.15 | 126.67 | 0.85 | 0.00E+000 | 3.0 |
| TH-228 | | 5.400 | 22.98 | 41.93 | 1.02 | 0.00E+000 | 4.4 |
| TH-229 | T | 4.903 | 131.49 | 17.13 | 0.51 | 0.00E+000 | 3.8 |
| TH-230 | | 4.652 | 28.66 | 36.86 | 0.34 | 0.00E+000 | 5.9 |
| TH-232 | | 3.977 | 28.83 | 36.63 | 0.17 | 0.00E+000 | 4.4 |

T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.997 | 5850.00* | 4.89E-002 +/- 6.26E-002 | 9.30E-002 +/- 1.69E-002 |
| TH-228 | 1.000 | 5400.00* | 3.81E-001 +/- 1.74E-001 | 1.05E-001 +/- 1.90E-002 |
| TH-229 | 0.995 | 4872.00* | 1.98E+000 +/- 3.61E-001 | 7.92E-002 +/- 1.44E-002 |
| TH-230 | 0.998 | 4672.00* | 4.31E-001 +/- 1.77E-001 | 7.19E-002 +/- 1.31E-002 |
| TH-232 | 0.998 | 3997.00* | 4.33E-001 +/- 1.77E-001 | 6.26E-002 +/- 1.14E-002 |

0000192392.CNF




0232

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 04

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 161: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 169: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 177: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 185: | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 193: | 2 | 0 | 4 | 2 | 2 | 1 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 04

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 393: | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 |
| 401: | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 409: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 417: | 0 | 2 | 0 | 3 | 2 | 1 | 0 | 2 |
| 425: | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |
| 433: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 441: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 449: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 457: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 465: | 0 | 1 | 2 | 3 | 3 | 0 | 2 | 7 |
| 473: | 1 | 2 | 2 | 2 | 1 | 1 | 4 | 6 |
| 481: | 5 | 3 | 2 | 3 | 2 | 3 | 3 | 5 |
| 489: | 0 | 0 | 0 | 3 | 4 | 3 | 0 | 1 |
| 497: | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| 505: | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 |
| 513: | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 2 |
| 521: | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 0 |
| 529: | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| 537: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 545: | 1 | 1 | 1 | 2 | 1 | 0 | 3 | 0 |
| 553: | 0 | 3 | 0 | 0 | 0 | 1 | 1 | 0 |
| 561: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| 649: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 657: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 2 | 1 | 0 | 0 | 2 | 0 | 1 |
| 673: | 3 | 1 | 1 | 1 | 2 | 1 | 0 | 0 |
| 681: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Sample Title: 04

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

KD 8/23/17

Apex-Alpha™

Sample Description: HTC-A03-S002-0612-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001923
Batch Identification: 1707087A-TH
Sample Identification: 05
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_060
Chamber Serial Number: 10006125B
Detector Serial Number: 60
Env. Background: System Bkgd 194231
Reagent Blank: <not performed>

Sample Size: 1.040E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 11:34:02 AM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1426 +/- 0.0134
Counting Efficiency: 0.1477 +/- 0.0026 on 11/18/2016 3:34:04 PM
Chem. Recovery Factor: 0.9660 +/- 0.0924

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

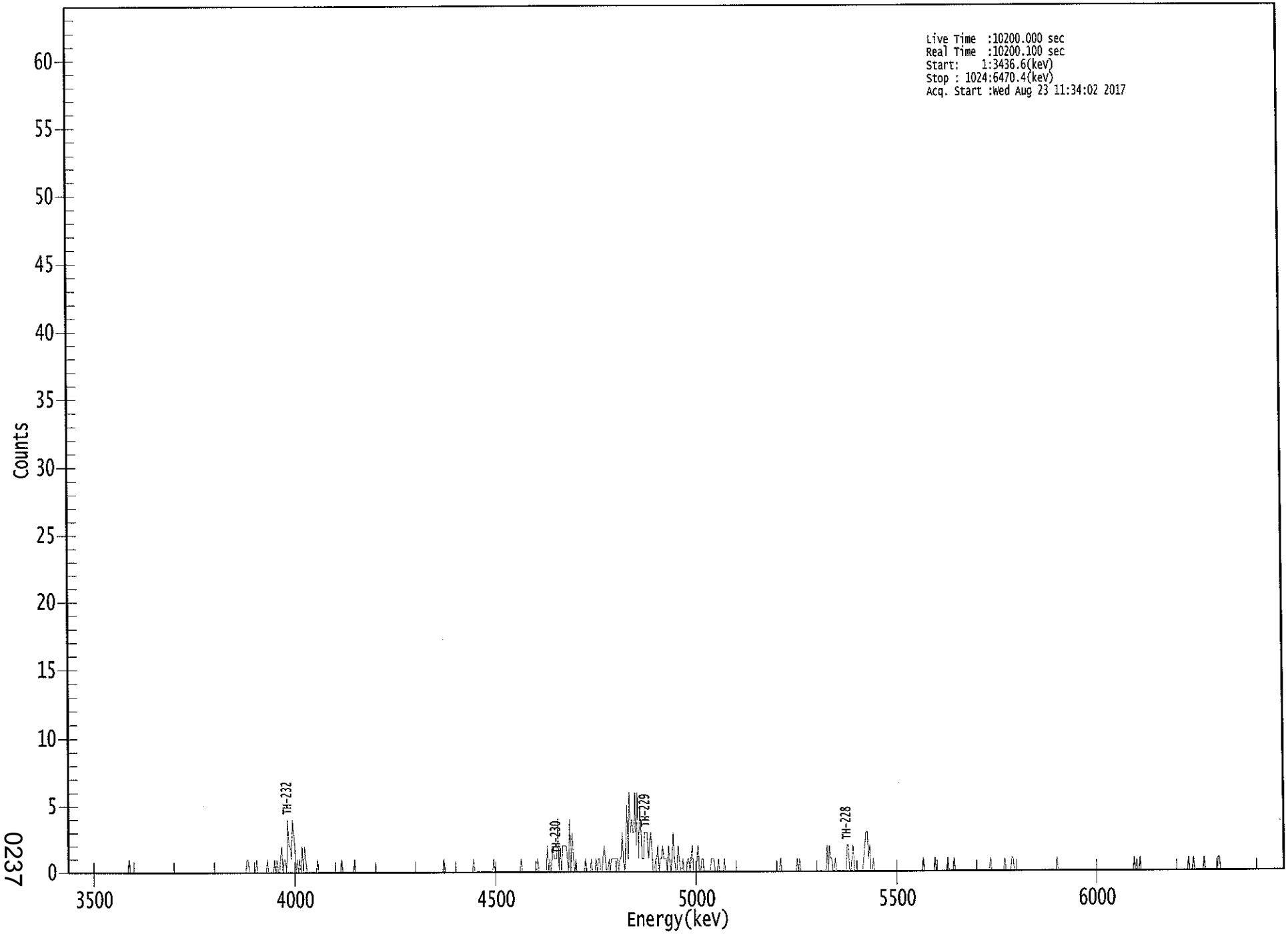
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.797 | 2.96 | 153.11 | 2.04 | 0.00E+000 | 3.0 |
| TH-228 | | 5.376 | 28.81 | 37.39 | 1.19 | 0.00E+000 | 9.6 |
| TH-229 | T | 4.874 | 127.98 | 17.41 | 1.02 | 0.00E+000 | 4.7 |
| TH-230 | | 4.653 | 36.30 | 33.41 | 1.70 | 0.00E+000 | 3.5 |
| TH-232 | | 3.983 | 36.83 | 32.38 | 0.17 | 0.00E+000 | 4.4 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.986 | 5850.00* | 5.47E-002 +/- 8.44E-002 | 1.44E-001 +/- 2.65E-002 |
| TH-228 | 0.997 | 5400.00* | 5.69E-001 +/- 2.37E-001 | 1.30E-001 +/- 2.40E-002 |
| TH-229 | 1.000 | 4872.00* | 2.30E+000 +/- 4.23E-001 | 1.13E-001 +/- 2.08E-002 |
| TH-230 | 0.998 | 4672.00* | 6.50E-001 +/- 2.48E-001 | 1.31E-001 +/- 2.42E-002 |
| TH-232 | 0.999 | 3997.00* | 6.58E-001 +/- 2.45E-001 | 7.45E-002 +/- 1.37E-002 |

0000192388.CNF




ROI Type: 1

ROI Type: 3

0237

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 05

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 153: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 169: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 177: | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 0 |
| 185: | 4 | 2 | 2 | 1 | 4 | 3 | 2 | 0 |
| 193: | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 1 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 05

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 393: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 401: | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 2 |
| 409: | 1 | 1 | 1 | 4 | 0 | 2 | 0 | 2 |
| 417: | 2 | 2 | 2 | 1 | 0 | 4 | 0 | 3 |
| 425: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 433: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 441: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 449: | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 0 |
| 457: | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 465: | 1 | 3 | 1 | 0 | 2 | 5 | 1 | 6 |
| 473: | 3 | 4 | 3 | 3 | 6 | 2 | 6 | 1 |
| 481: | 5 | 3 | 1 | 1 | 3 | 3 | 3 | 1 |
| 489: | 2 | 3 | 2 | 0 | 0 | 1 | 1 | 2 |
| 497: | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 0 |
| 505: | 2 | 1 | 0 | 1 | 3 | 1 | 0 | 0 |
| 513: | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 521: | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 0 |
| 529: | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 545: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| 641: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 657: | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 3 |
| 673: | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 745: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 793: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 05

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 945: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 969: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KB 8/23/17

Sample Description: HTC-A03-S002-1218-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 06
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_037
Chamber Serial Number: 04026478A
Detector Serial Number: 91133
Env. Background: System Bkgd 194211
Reagent Blank: <not performed>

Sample Size: 1.590E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:00 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1428 +/- 0.0134
Counting Efficiency: 0.1587 +/- 0.0027 on 11/18/2016 10:08:53 AM
Chem. Recovery Factor: 0.8998 +/- 0.0859

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

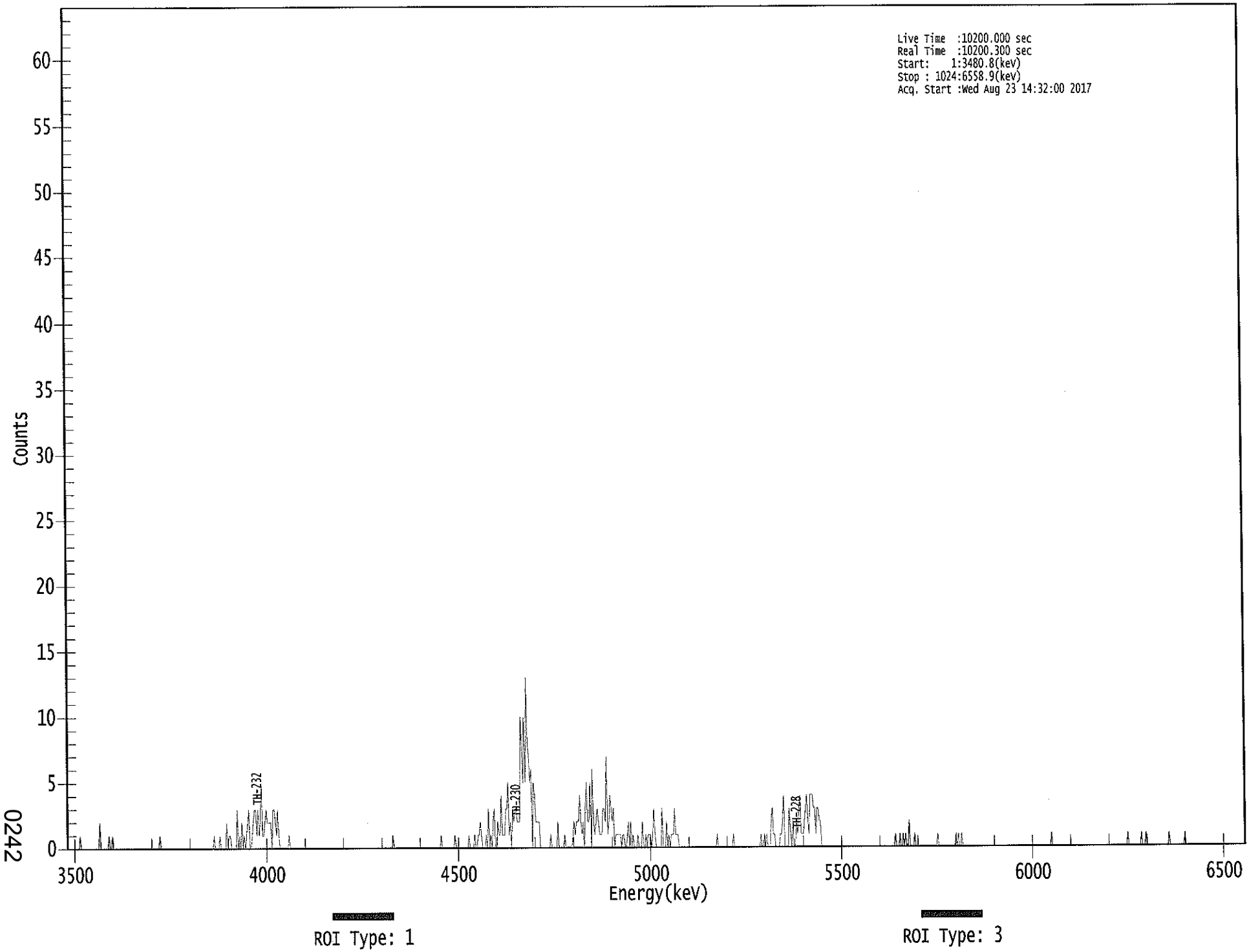
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.794 | 2.98 | 134.36 | 1.02 | 0.00E+000 | 3.0 |
| TH-228 | | 5.387 | 78.30 | 22.43 | 1.70 | 0.00E+000 | 4.5 |
| TH-229 | T | 4.896 | 128.15 | 17.38 | 0.85 | 0.00E+000 | 3.9 |
| TH-230 | | 4.653 | 154.49 | 15.80 | 0.51 | 0.00E+000 | 9.2 |
| TH-232 | | 3.977 | 68.15 | 23.91 | 0.85 | 0.00E+000 | 4.4 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.984 | 5850.00* | 3.60E-002 +/- 4.88E-002 | 7.60E-002 +/- 1.40E-002 |
| TH-228 | 0.999 | 5400.00* | 1.01E+000 +/- 2.93E-001 | 9.47E-002 +/- 1.74E-002 |
| TH-229 | 0.997 | 4872.00* | 1.50E+000 +/- 2.77E-001 | 7.02E-002 +/- 1.29E-002 |
| TH-230 | 0.998 | 4672.00* | 1.81E+000 +/- 4.38E-001 | 6.13E-002 +/- 1.13E-002 |
| TH-232 | 0.998 | 3997.00* | 7.95E-001 +/- 2.40E-001 | 6.98E-002 +/- 1.29E-002 |

0000192404.CNF




0242

```
*****************************************************
*****   S P E C T R A L   D A T A   R E P O R T   *****
*****************************************************
```

Sample Title: 06

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 129: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 137: | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 0 |
| 145: | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 2 |
| 153: | 0 | 1 | 0 | 1 | 2 | 3 | 0 | 0 |
| 161: | 1 | 2 | 3 | 3 | 1 | 3 | 1 | 2 |
| 169: | 5 | 1 | 1 | 2 | 3 | 2 | 2 | 2 |
| 177: | 2 | 0 | 3 | 3 | 2 | 1 | 3 | 1 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 353: | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 1 |
| 361: | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 2 | 3 | 0 | 0 | 2 | 1 | 1 |

Sample Title: 06

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 4 | 1 | 1 | 1 | 3 | 3 | 5 | 1 |
| 385: | 2 | 0 | 3 | 2 | 3 | 3 | 2 | 2 |
| 393: | 2 | 10 | 8 | 5 | 10 | 5 | 13 | 8 |
| 401: | 7 | 5 | 6 | 0 | 5 | 4 | 2 | 2 |
| 409: | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 417: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 425: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| 433: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 441: | 1 | 2 | 2 | 2 | 4 | 2 | 1 | 2 |
| 449: | 0 | 3 | 5 | 2 | 2 | 5 | 0 | 6 |
| 457: | 2 | 1 | 2 | 3 | 2 | 1 | 1 | 1 |
| 465: | 3 | 3 | 2 | 7 | 1 | 2 | 4 | 3 |
| 473: | 2 | 3 | 0 | 1 | 1 | 1 | 1 | 1 |
| 481: | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 0 |
| 489: | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 497: | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 |
| 505: | 1 | 1 | 0 | 1 | 3 | 1 | 0 | 0 |
| 513: | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 2 |
| 521: | 0 | 1 | 0 | 1 | 1 | 1 | 3 | 1 |
| 529: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 609: | 0 | 0 | 2 | 3 | 1 | 1 | 0 | 0 |
| 617: | 0 | 0 | 1 | 1 | 2 | 4 | 0 | 0 |
| 625: | 0 | 0 | 3 | 1 | 0 | 2 | 0 | 0 |
| 633: | 2 | 1 | 3 | 4 | 1 | 1 | 1 | 2 |
| 641: | 3 | 4 | 2 | 1 | 4 | 4 | 4 | 3 |
| 649: | 3 | 1 | 3 | 3 | 2 | 2 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 721: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 729: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 777: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 06

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 937: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KB 8/23/12

Sample Description: HTC-A03-S002-1824-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 07
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_038
Chamber Serial Number: 04026478B
Detector Serial Number: 91134
Env. Background: System Bkgd 194212
Reagent Blank: <not performed>

Sample Size: 1.060E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:02 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.236 mL
Effective Efficiency: 0.1678 +/- 0.0147
Counting Efficiency: 0.1543 +/- 0.0027 on 11/18/2016 10:08:51 AM
Chem. Recovery Factor: 1.0871 +/- 0.0968

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

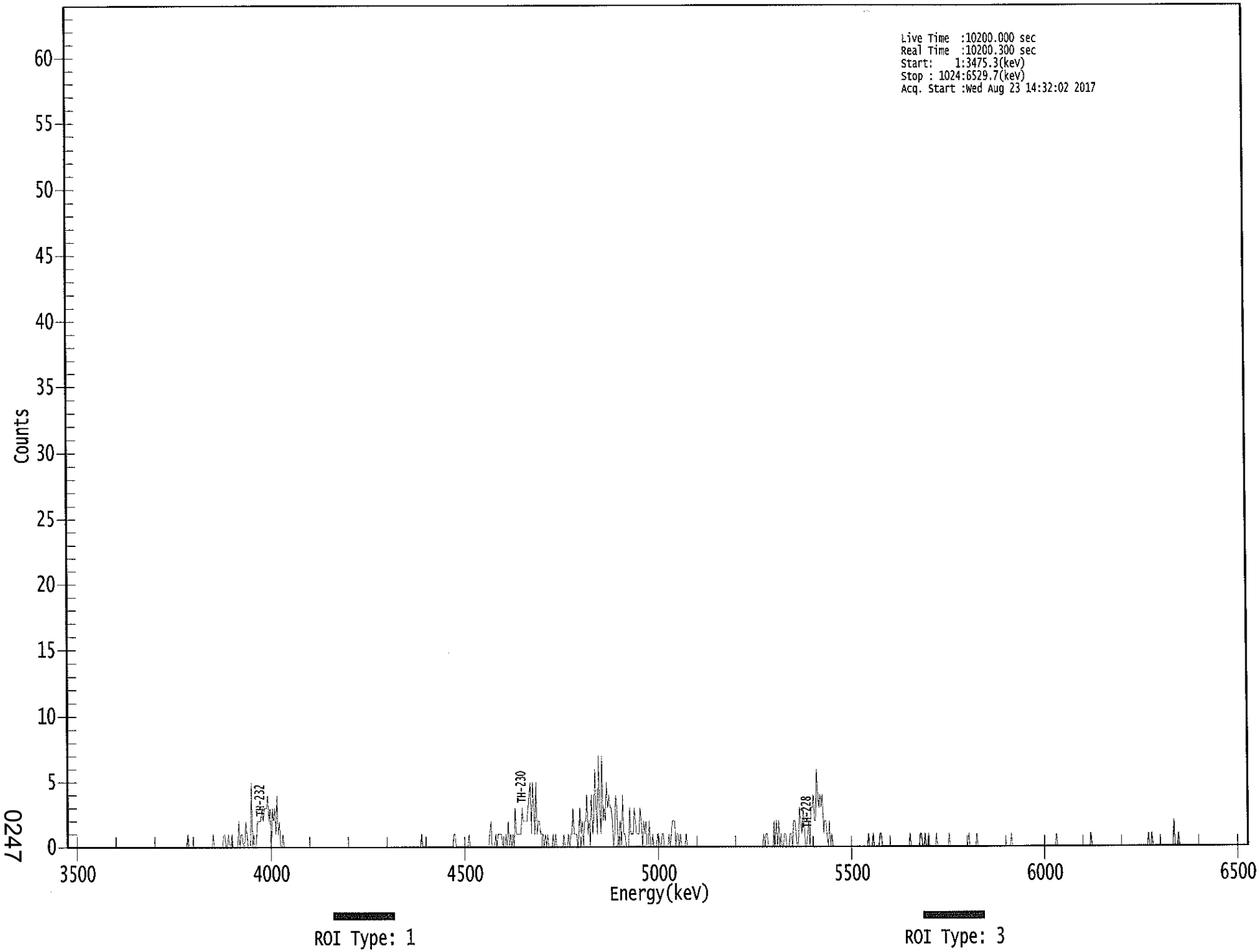
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.821 | 6.49 | 80.40 | 0.51 | 0.00E+000 | 3.0 |
| TH-228 | | 5.386 | 79.15 | 22.17 | 0.85 | 0.00E+000 | 8.2 |
| TH-229 | T | 4.883 | 150.98 | 16.01 | 1.02 | 0.00E+000 | 4.4 |
| TH-230 | | 4.648 | 72.00 | 23.26 | 0.00 | 0.00E+000 | 9.3 |
| TH-232 | | 3.974 | 65.15 | 24.47 | 0.85 | 0.00E+000 | 3.0 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.996 | 5850.00* | 1.00E-001 +/- 8.22E-002 | 8.09E-002 +/- 1.39E-002 |
| TH-228 | 0.999 | 5400.00* | 1.30E+000 +/- 3.65E-001 | 9.86E-002 +/- 1.69E-002 |
| TH-229 | 0.999 | 4872.00* | 2.26E+000 +/- 3.87E-001 | 9.43E-002 +/- 1.62E-002 |
| TH-230 | 0.997 | 4672.00* | 1.07E+000 +/- 3.10E-001 | 8.95E-002 +/- 1.53E-002 |
| TH-232 | 0.997 | 3997.00* | 9.71E-001 +/- 2.90E-001 | 8.92E-002 +/- 1.53E-002 |

# 0000192406.CNF



**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 07

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 137: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 145: | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 |
| 153: | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 5 |
| 161: | 0 | 1 | 0 | 0 | 2 | 2 | 2 | 2 |
| 169: | 3 | 2 | 3 | 3 | 3 | 4 | 2 | 3 |
| 177: | 0 | 3 | 2 | 3 | 1 | 4 | 1 | 2 |
| 185: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |

Sample Title: 07

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 |
| 385: | 0 | 1 | 0 | 3 | 1 | 1 | 1 | 1 |
| 393: | 1 | 3 | 2 | 2 | 2 | 2 | 3 | 4 |
| 401: | 5 | 1 | 5 | 3 | 1 | 5 | 1 | 2 |
| 409: | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 417: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 425: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 433: | 0 | 1 | 0 | 1 | 1 | 3 | 1 | 1 |
| 441: | 1 | 0 | 1 | 3 | 1 | 2 | 0 | 2 |
| 449: | 2 | 4 | 1 | 2 | 0 | 4 | 1 | 2 |
| 457: | 6 | 3 | 1 | 7 | 3 | 1 | 7 | 2 |
| 465: | 3 | 2 | 5 | 3 | 4 | 3 | 3 | 2 |
| 473: | 0 | 1 | 4 | 3 | 0 | 1 | 2 | 0 |
| 481: | 4 | 1 | 1 | 0 | 0 | 0 | 3 | 1 |
| 489: | 1 | 1 | 3 | 2 | 1 | 1 | 1 | 3 |
| 497: | 2 | 0 | 2 | 1 | 2 | 0 | 0 | 2 |
| 505: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 513: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 521: | 1 | 0 | 1 | 2 | 2 | 2 | 0 | 1 |
| 529: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 609: | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 |
| 617: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 625: | 0 | 1 | 1 | 0 | 2 | 2 | 1 | 0 |
| 633: | 0 | 3 | 2 | 1 | 3 | 2 | 0 | 0 |
| 641: | 1 | 2 | 0 | 3 | 3 | 4 | 2 | 2 |
| 649: | 6 | 4 | 3 | 4 | 3 | 4 | 1 | 2 |
| 657: | 2 | 1 | 0 | 2 | 0 | 1 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 697: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 705: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 745: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 07

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 961: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NB 9/23/17

# Apex-Alpha™

Sample Description: HTC-A03-S002-2430-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 08
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_039
Chamber Serial Number: 06027396A
Detector Serial Number: 83109
Env. Background: System Bkgd 194213
Reagent Blank: <not performed>

Sample Size: 1.260E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:04 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.236 mL
Effective Efficiency: 0.1655 +/- 0.0146
Counting Efficiency: 0.1852 +/- 0.0031 on 11/18/2016 10:08:50 AM
Chem. Recovery Factor: 0.8936 +/- 0.0804

Peak Match Tolerance: 0.175 MeV

## PEAK AREA REPORT

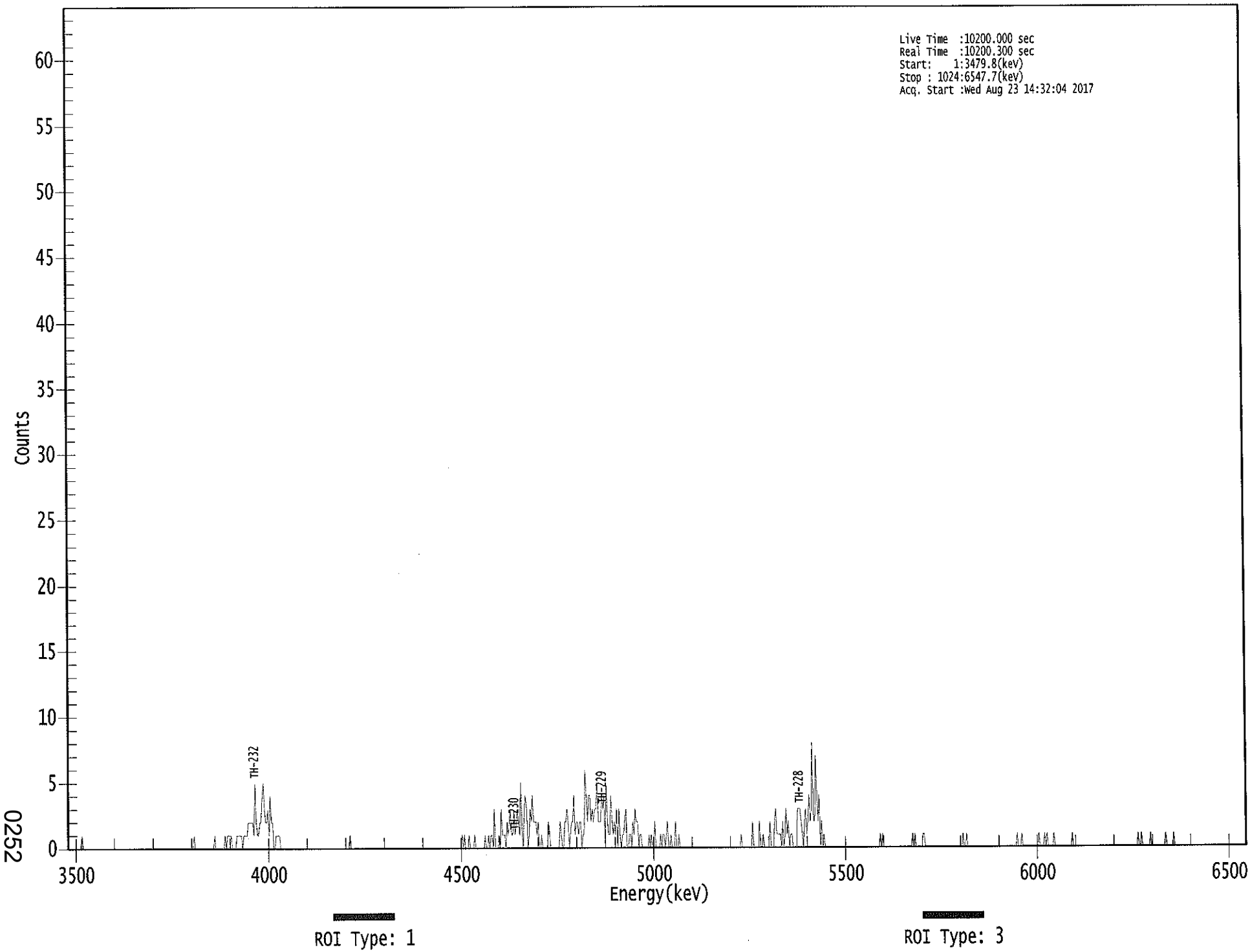
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.903 | 9.32 | 66.89 | 0.68 | 0.00E+000 | 6.0 |
| TH-228 | | 5.380 | 86.45 | 21.44 | 2.55 | 0.00E+000 | 4.4 |
| TH-229 | T | 4.869 | 149.28 | 16.21 | 2.72 | 0.00E+000 | 6.3 |
| TH-230 | | 4.641 | 74.81 | 22.87 | 1.19 | 0.00E+000 | 3.7 |
| TH-232 | | 3.967 | 71.15 | 23.40 | 0.85 | 0.00E+000 | 4.4 |

T = Tracer Peak used for Effective Efficiency

## NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.985 | 5850.00* | 1.23E-001 +/- 8.47E-002 | 7.42E-002 +/- 1.28E-002 |
| TH-228 | 0.998 | 5400.00* | 1.21E+000 +/- 3.35E-001 | 1.18E-001 +/- 2.04E-002 |
| TH-229 | 1.000 | 4872.00* | 1.91E+000 +/- 3.30E-001 | 1.10E-001 +/- 1.90E-002 |
| TH-230 | 0.995 | 4672.00* | 9.52E-001 +/- 2.73E-001 | 8.39E-002 +/- 1.45E-002 |
| TH-232 | 0.995 | 3997.00* | 9.04E-001 +/- 2.63E-001 | 7.61E-002 +/- 1.32E-002 |

0000192409.CNF




0252

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 08

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| 145: | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 153: | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| 161: | 2 | 1 | 5 | 2 | 1 | 1 | 2 | 2 |
| 169: | 4 | 5 | 3 | 2 | 2 | 3 | 1 | 4 |
| 177: | 2 | 2 | 0 | 0 | 1 | 1 | 1 | 1 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 345: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 353: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 3 |

Sample Title: 08

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 3 |
| 385: | 1 | 1 | 3 | 1 | 2 | 3 | 2 | 1 |
| 393: | 5 | 1 | 0 | 3 | 4 | 3 | 0 | 1 |
| 401: | 3 | 2 | 4 | 2 | 2 | 2 | 1 | 2 |
| 409: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 417: | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 425: | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 2 |
| 433: | 3 | 2 | 0 | 1 | 2 | 2 | 4 | 1 |
| 441: | 2 | 2 | 1 | 2 | 2 | 0 | 1 | 1 |
| 449: | 6 | 4 | 2 | 4 | 4 | 2 | 3 | 2 |
| 457: | 3 | 3 | 5 | 2 | 2 | 2 | 4 | 3 |
| 465: | 4 | 0 | 5 | 2 | 1 | 1 | 4 | 2 |
| 473: | 1 | 2 | 1 | 3 | 0 | 3 | 1 | 0 |
| 481: | 1 | 1 | 2 | 3 | 0 | 0 | 1 | 1 |
| 489: | 0 | 2 | 1 | 3 | 2 | 2 | 0 | 1 |
| 497: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 505: | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 |
| 513: | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 |
| 521: | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 |
| 529: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 601: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 609: | 2 | 0 | 0 | 0 | 2 | 3 | 1 | 1 |
| 617: | 1 | 1 | 0 | 2 | 0 | 1 | 3 | 1 |
| 625: | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 633: | 3 | 3 | 3 | 2 | 1 | 0 | 2 | 3 |
| 641: | 1 | 2 | 4 | 2 | 3 | 8 | 2 | 2 |
| 649: | 7 | 4 | 2 | 4 | 0 | 2 | 0 | 1 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 08

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 825: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 849: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

NB 8/23/17

Sample Description: HTC-A03-S002-3036-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 09
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_040
Chamber Serial Number: 06027396B
Detector Serial Number: 91135
Env. Background: System Bkgd 194214
Reagent Blank: <not performed>

Sample Size: 1.080E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:06 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1577 +/- 0.0142
Counting Efficiency: 0.1813 +/- 0.0031 on 11/18/2016 10:08:48 AM
Chem. Recovery Factor: 0.8697 +/- 0.0794

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

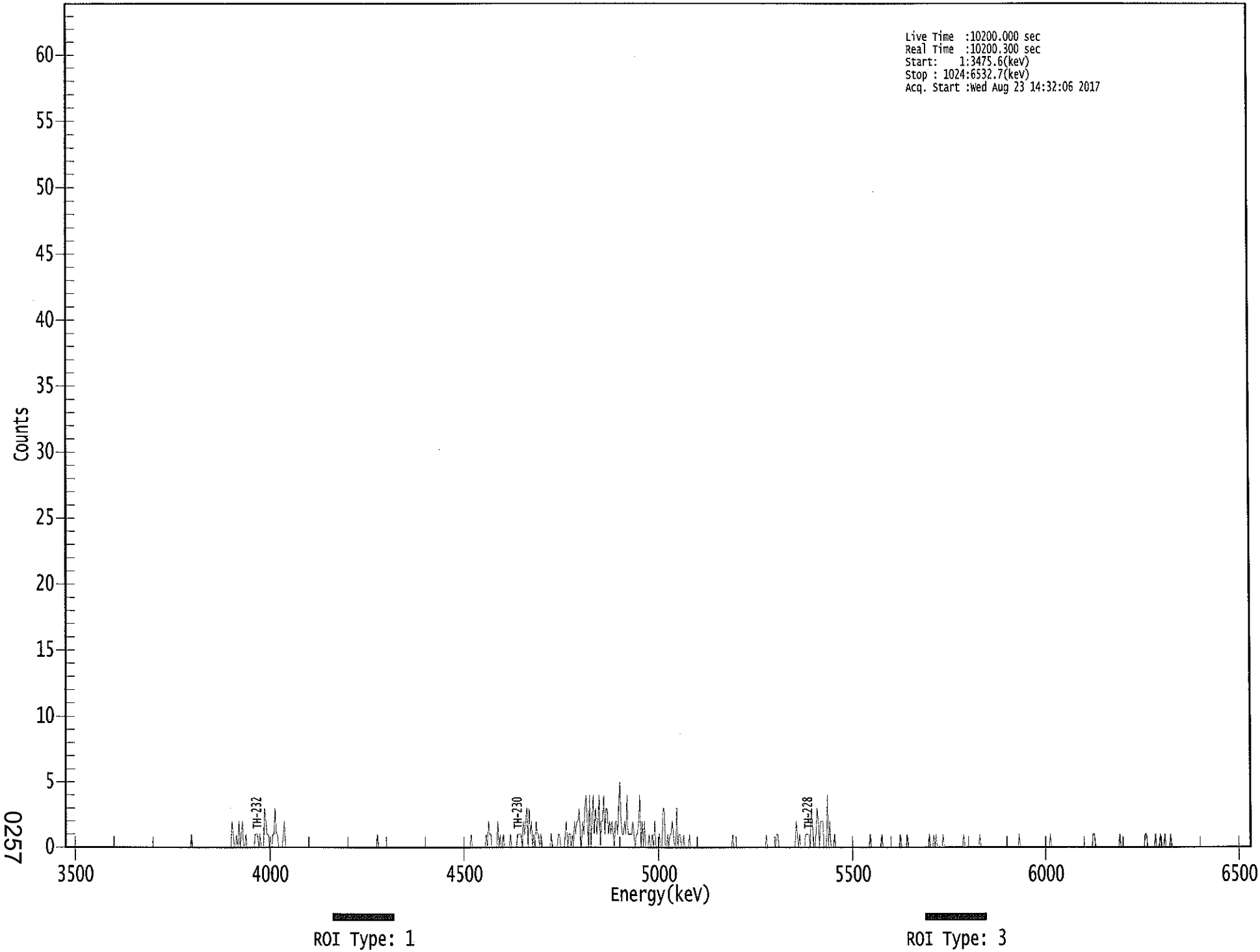
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.803 | 7.32 | 76.28 | 0.68 | 0.00E+000 | 3.0 |
| TH-228 | | 5.390 | 33.81 | 34.40 | 1.19 | 0.00E+000 | 3.0 |
| TH-229 | T | 4.888 | 141.49 | 16.51 | 0.51 | 0.00E+000 | 6.2 |
| TH-230 | | 4.640 | 35.66 | 33.00 | 0.34 | 0.00E+000 | 6.0 |
| TH-232 | | 3.969 | 31.32 | 35.46 | 0.68 | 0.00E+000 | 6.0 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.989 | 5850.00* | 1.18E-001 +/- 9.22E-002 | 9.08E-002 +/- 1.60E-002 |
| TH-228 | 0.999 | 5400.00* | 5.81E-001 +/- 2.25E-001 | 1.13E-001 +/- 1.99E-002 |
| TH-229 | 0.999 | 4872.00* | 2.21E+000 +/- 3.89E-001 | 8.20E-002 +/- 1.44E-002 |
| TH-230 | 0.995 | 4672.00* | 5.56E-001 +/- 2.08E-001 | 7.45E-002 +/- 1.31E-002 |
| TH-232 | 0.996 | 3997.00* | 4.87E-001 +/- 1.93E-001 | 8.77E-002 +/- 1.54E-002 |

# 0000192412.CNF




0257

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 09

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 145: | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 1 |
| 153: | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 161: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| 169: | 0 | 0 | 0 | 3 | 2 | 1 | 1 | 0 |
| 177: | 0 | 0 | 1 | 1 | 3 | 1 | 1 | 0 |
| 185: | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 |

Sample Title: 09

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 385: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 393: | 1 | 0 | 2 | 1 | 2 | 3 | 0 | 3 |
| 401: | 1 | 2 | 0 | 1 | 0 | 2 | 1 | 1 |
| 409: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 417: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 425: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| 433: | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 1 |
| 441: | 2 | 2 | 3 | 1 | 0 | 2 | 1 | 3 |
| 449: | 4 | 2 | 0 | 4 | 0 | 2 | 4 | 1 |
| 457: | 3 | 1 | 2 | 4 | 0 | 2 | 2 | 4 |
| 465: | 1 | 3 | 3 | 1 | 2 | 1 | 2 | 1 |
| 473: | 0 | 2 | 2 | 1 | 3 | 5 | 2 | 1 |
| 481: | 1 | 2 | 1 | 4 | 1 | 1 | 1 | 1 |
| 489: | 2 | 1 | 0 | 1 | 1 | 2 | 4 | 0 |
| 497: | 2 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 505: | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 |
| 513: | 0 | 0 | 3 | 3 | 0 | 0 | 1 | 0 |
| 521: | 1 | 1 | 2 | 1 | 0 | 0 | 3 | 0 |
| 529: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 537: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 |
| 633: | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 641: | 1 | 0 | 3 | 2 | 0 | 0 | 1 | 3 |
| 649: | 2 | 0 | 2 | 2 | 2 | 0 | 0 | 0 |
| 657: | 4 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 721: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 753: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 09

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 945: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 953: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KB 8/23/17

Sample Description: HTC-A03-S002-3036-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 10
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_043
Chamber Serial Number: 04026481A
Detector Serial Number: 91088
Env. Background: System Bkgd 194215
Reagent Blank: <not performed>

Sample Size: 1.060E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:09 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.234 mL
Effective Efficiency: 0.2209 +/- 0.0172
Counting Efficiency: 0.1874 +/- 0.0032 on 11/18/2016 10:08:43 AM
Chem. Recovery Factor: 1.1782 +/- 0.0939

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

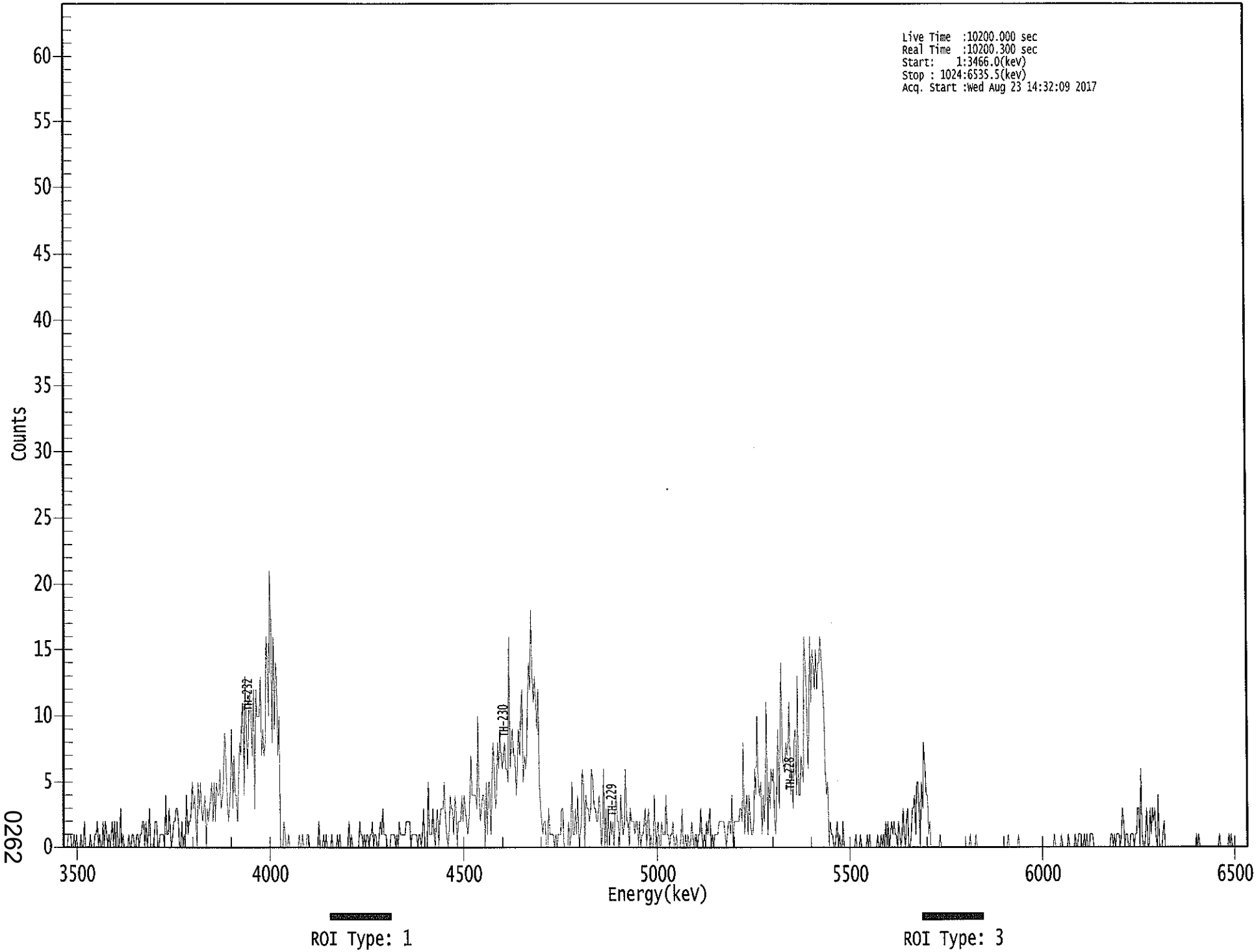
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.779 | 16.81 | 49.75 | 1.19 | 0.00E+000 | 0.0 |
| TH-228 | | 5.347 | 568.79 | 8.24 | 2.21 | 0.00E+000 | 10.2 |
| TH-229 | T | 4.887 | 197.64 | 14.00 | 1.36 | 0.00E+000 | 6.5 |
| TH-230 | | 4.606 | 503.98 | 8.74 | 1.02 | 0.00E+000 | 25.5 |
| TH-232 | | 3.945 | 531.00 | 8.51 | 0.00 | 0.00E+000 | 8.0 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.974 | 5850.00* | 1.97E-001 +/- 1.02E-001 | 7.71E-002 +/- 1.18E-002 |
| TH-228 | 0.985 | 5400.00* | 7.12E+000 +/- 1.23E+000 | 1.00E-001 +/- 1.53E-002 |
| TH-229 | 0.999 | 4872.00* | 2.25E+000 +/- 3.43E-001 | 7.80E-002 +/- 1.19E-002 |
| TH-230 | 0.978 | 4672.00* | 5.71E+000 +/- 1.00E+000 | 7.14E-002 +/- 1.09E-002 |
| TH-232 | 0.986 | 3997.00* | 6.01E+000 +/- 1.05E+000 | 6.79E-002 +/- 1.04E-002 |

# 0000192415.CNF




0262

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 10

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 9: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 17: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 25: | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 1 |
| 33: | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 1 |
| 41: | 0 | 1 | 2 | 0 | 2 | 0 | 2 | 0 |
| 49: | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| 57: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 65: | 1 | 0 | 1 | 1 | 2 | 2 | 0 | 2 |
| 73: | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 2 |
| 81: | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 89: | 4 | 1 | 1 | 3 | 1 | 0 | 1 | 2 |
| 97: | 2 | 3 | 3 | 2 | 0 | 0 | 2 | 0 |
| 105: | 1 | 0 | 4 | 1 | 2 | 2 | 3 | 5 |
| 113: | 3 | 4 | 2 | 0 | 5 | 3 | 5 | 3 |
| 121: | 2 | 3 | 4 | 0 | 3 | 2 | 3 | 4 |
| 129: | 5 | 2 | 5 | 2 | 5 | 4 | 4 | 6 |
| 137: | 3 | 4 | 5 | 9 | 7 | 4 | 2 | 3 |
| 145: | 5 | 9 | 3 | 7 | 4 | 4 | 2 | 5 |
| 153: | 8 | 7 | 10 | 11 | 4 | 13 | 9 | 6 |
| 161: | 10 | 12 | 10 | 7 | 12 | 3 | 12 | 10 |
| 169: | 10 | 10 | 13 | 7 | 9 | 7 | 8 | 16 |
| 177: | 14 | 10 | 21 | 17 | 8 | 16 | 9 | 14 |
| 185: | 13 | 7 | 10 | 0 | 0 | 0 | 2 | 1 |
| 193: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 209: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 225: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 233: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 249: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 257: | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 265: | 1 | 1 | 2 | 0 | 1 | 1 | 0 | 0 |
| 273: | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 0 |
| 281: | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| 289: | 0 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| 297: | 2 | 2 | 2 | 0 | 1 | 1 | 1 | 1 |
| 305: | 1 | 0 | 1 | 1 | 0 | 1 | 3 | 0 |
| 313: | 0 | 0 | 5 | 1 | 1 | 1 | 3 | 1 |
| 321: | 0 | 2 | 3 | 0 | 2 | 3 | 3 | 3 |
| 329: | 5 | 2 | 1 | 0 | 1 | 4 | 3 | 3 |
| 337: | 1 | 4 | 3 | 0 | 2 | 2 | 2 | 4 |
| 345: | 2 | 4 | 3 | 2 | 1 | 2 | 4 | 7 |
| 353: | 4 | 4 | 4 | 4 | 3 | 10 | 4 | 2 |
| 361: | 3 | 4 | 4 | 0 | 5 | 1 | 5 | 5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 1 | 5 | 8 | 6 | 3 | 4 | 8 | 6 |

Sample Title: 10

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 9 | 7 | 6 | 7 | 8 | 6 | 6 | 5 |
| 385: | 16 | 6 | 8 | 9 | 7 | 7 | 4 | 6 |
| 393: | 9 | 7 | 10 | 12 | 5 | 7 | 6 | 7 |
| 401: | 11 | 14 | 12 | 18 | 13 | 11 | 13 | 11 |
| 409: | 9 | 12 | 5 | 3 | 2 | 1 | 2 | 2 |
| 417: | 0 | 0 | 3 | 1 | 1 | 1 | 1 | 0 |
| 425: | 1 | 0 | 1 | 1 | 1 | 3 | 3 | 0 |
| 433: | 0 | 0 | 0 | 2 | 0 | 1 | 5 | 1 |
| 441: | 1 | 3 | 1 | 4 | 0 | 1 | 2 | 6 |
| 449: | 5 | 0 | 4 | 3 | 3 | 2 | 3 | 6 |
| 457: | 5 | 3 | 3 | 2 | 2 | 4 | 3 | 0 |
| 465: | 1 | 6 | 0 | 3 | 0 | 3 | 0 | 2 |
| 473: | 1 | 2 | 0 | 3 | 4 | 2 | 2 | 0 |
| 481: | 4 | 2 | 1 | 2 | 6 | 2 | 2 | 0 |
| 489: | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 0 |
| 497: | 2 | 0 | 1 | 1 | 2 | 3 | 0 | 2 |
| 505: | 3 | 0 | 1 | 0 | 0 | 4 | 0 | 1 |
| 513: | 2 | 0 | 0 | 2 | 1 | 1 | 1 | 4 |
| 521: | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 0 |
| 529: | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 |
| 537: | 1 | 0 | 1 | 0 | 0 | 2 | 1 | 0 |
| 545: | 1 | 1 | 0 | 1 | 1 | 3 | 1 | 0 |
| 553: | 1 | 0 | 2 | 1 | 2 | 3 | 0 | 1 |
| 561: | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| 569: | 2 | 2 | 1 | 0 | 1 | 2 | 2 | 1 |
| 577: | 4 | 0 | 2 | 2 | 2 | 2 | 2 | 3 |
| 585: | 3 | 2 | 8 | 1 | 3 | 4 | 1 | 4 |
| 593: | 2 | 1 | 1 | 2 | 6 | 4 | 10 | 5 |
| 601: | 4 | 5 | 1 | 4 | 2 | 5 | 11 | 1 |
| 609: | 5 | 3 | 6 | 5 | 6 | 2 | 1 | 5 |
| 617: | 9 | 3 | 8 | 14 | 7 | 6 | 6 | 8 |
| 625: | 7 | 8 | 11 | 4 | 6 | 3 | 8 | 9 |
| 633: | 4 | 13 | 4 | 4 | 7 | 6 | 5 | 16 |
| 641: | 14 | 12 | 6 | 9 | 16 | 11 | 15 | 14 |
| 649: | 12 | 15 | 12 | 14 | 14 | 16 | 14 | 13 |
| 657: | 10 | 6 | 4 | 5 | 0 | 2 | 1 | 1 |
| 665: | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 |
| 673: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 689: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 705: | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 |
| 713: | 0 | 1 | 2 | 1 | 2 | 1 | 1 | 0 |
| 721: | 2 | 1 | 0 | 1 | 3 | 1 | 0 | 2 |
| 729: | 3 | 0 | 0 | 1 | 3 | 3 | 4 | 1 |
| 737: | 5 | 5 | 3 | 0 | 5 | 3 | 8 | 6 |
| 745: | 4 | 4 | 1 | 2 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 785: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 10

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 857: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 865: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 873: | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 |
| 881: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 889: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |
| 913: | 0 | 1 | 3 | 2 | 0 | 1 | 1 | 0 |
| 921: | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 3 |
| 929: | 3 | 0 | 6 | 1 | 0 | 0 | 1 | 3 |
| 937: | 0 | 0 | 3 | 1 | 3 | 2 | 3 | 1 |
| 945: | 0 | 4 | 0 | 0 | 0 | 1 | 2 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1009: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

KB 3/23/17

Apex-Alpha™

Sample Description: HTC-A03-S002-3036-01 MSD
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 11
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_044
Chamber Serial Number: 04026481B
Detector Serial Number: 84168
Env. Background: System Bkgd 194216
Reagent Blank: <not performed>

Sample Size: 1.090E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:11 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1787 +/- 0.0152
Counting Efficiency: 0.1793 +/- 0.0030 on 11/18/2016 10:08:42 AM
Chem. Recovery Factor: 0.9968 +/- 0.0863

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

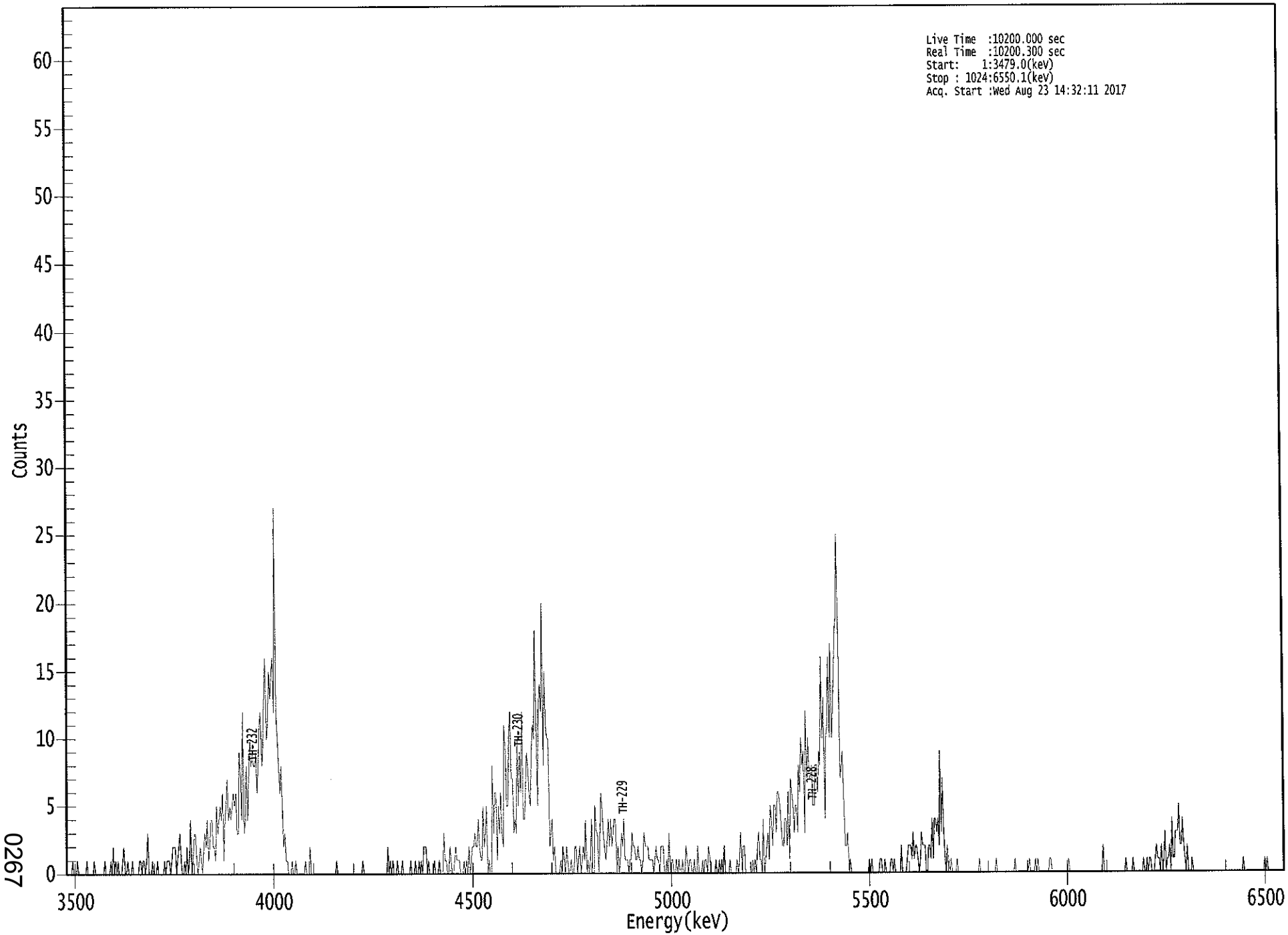
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.833 | 13.32 | 55.28 | 0.68 | 0.00E+000 | 3.0 |
| TH-228 | | 5.358 | 532.49 | 8.50 | 0.51 | 0.00E+000 | 15.9 |
| TH-229 | T | 4.882 | 160.66 | 15.48 | 0.34 | 0.00E+000 | 8.3 |
| TH-230 | | 4.619 | 446.83 | 9.27 | 0.17 | 0.00E+000 | 12.4 |
| TH-232 | | 3.949 | 497.83 | 8.79 | 0.17 | 0.00E+000 | 5.4 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.998 | 5850.00* | 1.87E-001 +/- 1.08E-001 | 7.94E-002 +/- 1.32E-002 |
| TH-228 | 0.991 | 5400.00* | 8.01E+000 +/- 1.50E+000 | 7.89E-002 +/- 1.31E-002 |
| TH-229 | 0.999 | 4872.00* | 2.20E+000 +/- 3.65E-001 | 6.54E-002 +/- 1.09E-002 |
| TH-230 | 0.986 | 4672.00* | 6.09E+000 +/- 1.16E+000 | 5.69E-002 +/- 9.46E-003 |
| TH-232 | 0.988 | 3997.00* | 6.77E+000 +/- 1.27E+000 | 5.68E-002 +/- 9.44E-003 |

0000192416.CNF




0267

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 11

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 9: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 41: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 49: | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 57: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 65: | 1 | 1 | 0 | 1 | 3 | 0 | 0 | 0 |
| 73: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 81: | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| 89: | 1 | 2 | 2 | 2 | 0 | 1 | 2 | 3 |
| 97: | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 1 |
| 105: | 4 | 0 | 1 | 3 | 3 | 1 | 0 | 1 |
| 113: | 2 | 1 | 0 | 2 | 3 | 2 | 4 | 1 |
| 121: | 2 | 4 | 4 | 2 | 2 | 1 | 5 | 3 |
| 129: | 4 | 5 | 4 | 6 | 1 | 4 | 5 | 7 |
| 137: | 4 | 5 | 4 | 5 | 6 | 5 | 6 | 3 |
| 145: | 3 | 9 | 7 | 4 | 12 | 3 | 4 | 8 |
| 153: | 4 | 7 | 10 | 8 | 9 | 8 | 8 | 9 |
| 161: | 6 | 8 | 11 | 12 | 8 | 9 | 14 | 16 |
| 169: | 10 | 11 | 15 | 13 | 15 | 16 | 12 | 27 |
| 177: | 12 | 10 | 8 | 6 | 8 | 5 | 2 | 3 |
| 185: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 193: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |
| 273: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 281: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 297: | 0 | 1 | 0 | 2 | 2 | 2 | 0 | 1 |
| 305: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 313: | 1 | 0 | 0 | 0 | 3 | 1 | 1 | 0 |
| 321: | 0 | 2 | 1 | 0 | 0 | 1 | 2 | 1 |
| 329: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 337: | 0 | 2 | 0 | 1 | 2 | 2 | 3 | 2 |
| 345: | 2 | 4 | 2 | 1 | 1 | 5 | 2 | 3 |
| 353: | 5 | 0 | 1 | 0 | 0 | 8 | 3 | 6 |
| 361: | 6 | 1 | 5 | 3 | 6 | 3 | 2 | 11 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 9 | 5 | 5 | 10 | 12 | 7 | 7 | 3 |

Sample Title: 11

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 4 | 3 | 10 | 5 | 9 | 6 | 12 | 4 |
| 385: | 4 | 6 | 9 | 8 | 6 | 5 | 9 | 11 |
| 393: | 10 | 18 | 12 | 5 | 12 | 14 | 12 | 20 |
| 401: | 8 | 15 | 11 | 10 | 10 | 2 | 3 | 4 |
| 409: | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| 417: | 2 | 1 | 0 | 2 | 1 | 0 | 0 | 1 |
| 425: | 0 | 0 | 2 | 2 | 0 | 1 | 2 | 0 |
| 433: | 1 | 2 | 1 | 4 | 0 | 1 | 0 | 1 |
| 441: | 4 | 0 | 0 | 5 | 3 | 3 | 0 | 2 |
| 449: | 6 | 5 | 3 | 2 | 1 | 2 | 4 | 2 |
| 457: | 4 | 2 | 3 | 4 | 4 | 0 | 2 | 0 |
| 465: | 1 | 3 | 2 | 4 | 1 | 1 | 1 | 0 |
| 473: | 1 | 1 | 3 | 2 | 2 | 1 | 1 | 2 |
| 481: | 1 | 1 | 0 | 1 | 3 | 2 | 2 | 2 |
| 489: | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 1 |
| 497: | 1 | 0 | 2 | 2 | 2 | 0 | 0 | 1 |
| 505: | 0 | 3 | 0 | 1 | 1 | 0 | 0 | 1 |
| 513: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 |
| 521: | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 529: | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 |
| 537: | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |
| 545: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 2 |
| 553: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 561: | 0 | 0 | 1 | 0 | 1 | 3 | 0 | 2 |
| 569: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 577: | 0 | 1 | 0 | 2 | 3 | 1 | 1 | 0 |
| 585: | 4 | 0 | 1 | 2 | 3 | 1 | 5 | 4 |
| 593: | 2 | 5 | 5 | 3 | 6 | 6 | 5 | 4 |
| 601: | 2 | 2 | 4 | 4 | 2 | 6 | 1 | 7 |
| 609: | 6 | 5 | 3 | 5 | 5 | 3 | 8 | 6 |
| 617: | 10 | 8 | 9 | 3 | 12 | 7 | 10 | 7 |
| 625: | 7 | 8 | 5 | 5 | 8 | 8 | 6 | 9 |
| 633: | 8 | 16 | 10 | 13 | 4 | 10 | 11 | 16 |
| 641: | 10 | 17 | 10 | 12 | 15 | 18 | 19 | 25 |
| 649: | 17 | 7 | 8 | 9 | 5 | 2 | 2 | 3 |
| 657: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 689: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 697: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 705: | 0 | 1 | 2 | 2 | 2 | 1 | 3 | 1 |
| 713: | 2 | 2 | 1 | 0 | 1 | 3 | 2 | 2 |
| 721: | 2 | 0 | 0 | 2 | 2 | 1 | 4 | 1 |
| 729: | 4 | 4 | 3 | 4 | 2 | 9 | 3 | 7 |
| 737: | 3 | 1 | 0 | 2 | 1 | 0 | 1 | 0 |
| 745: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 11

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 913: | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 2 |
| 921: | 0 | 1 | 3 | 0 | 1 | 1 | 2 | 0 |
| 929: | 4 | 1 | 1 | 3 | 3 | 3 | 5 | 2 |
| 937: | 2 | 4 | 2 | 1 | 0 | 2 | 0 | 0 |
| 945: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1009: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KB 9/23/18

Sample Description: HTC-A03-S002-3036-02
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 12
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_045
Chamber Serial Number: 04026482A
Detector Serial Number: 91131
Env. Background: System Bkgd 194217
Reagent Blank: <not performed>

Sample Size: 1.220E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:14 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1929 +/- 0.0159
Counting Efficiency: 0.1688 +/- 0.0029 on 11/18/2016 10:08:40 AM
Chem. Recovery Factor: 1.1429 +/- 0.0961

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

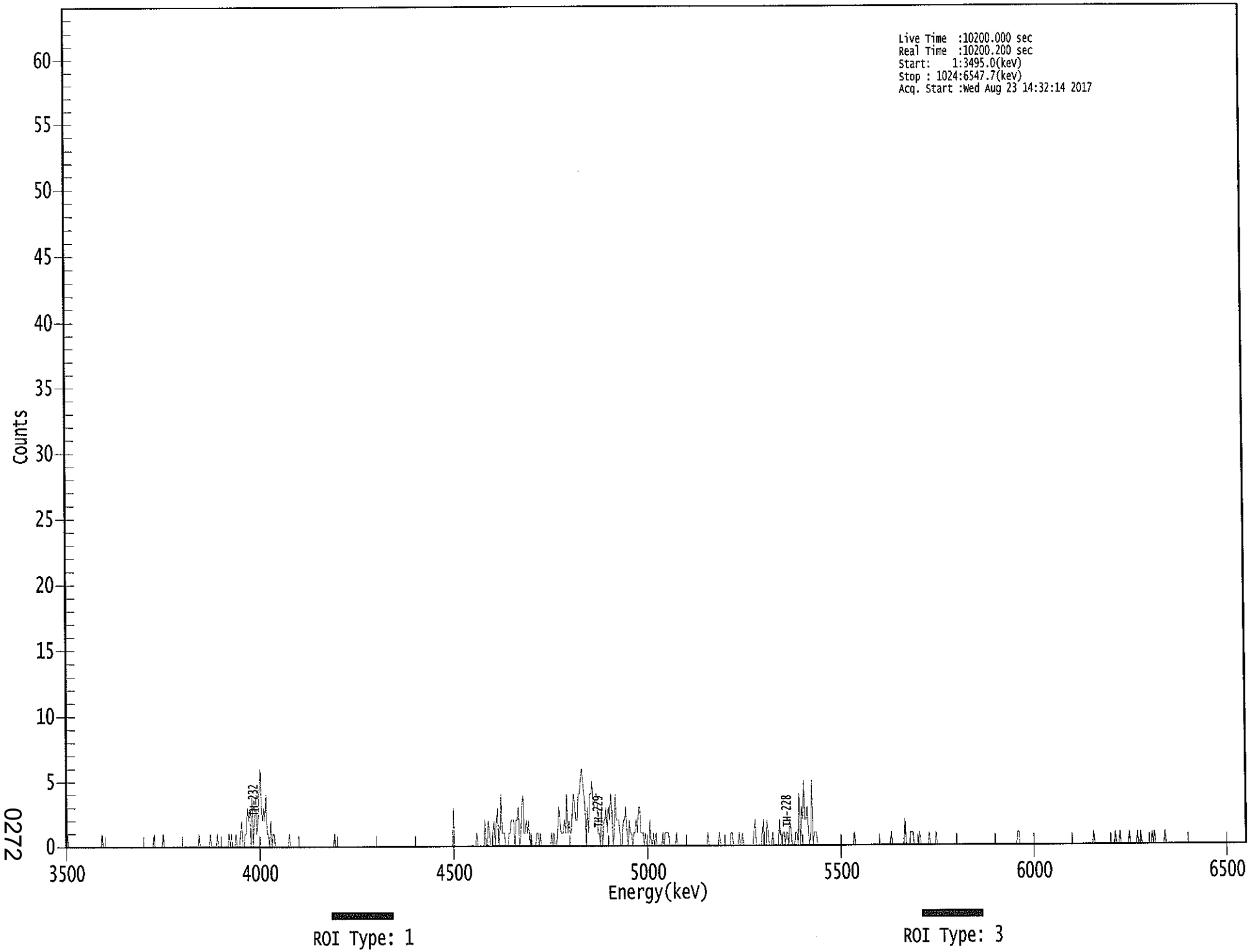
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.815 | 4.49 | 98.45 | 0.51 | 0.00E+000 | 3.0 |
| TH-228 | | 5.356 | 57.30 | 26.34 | 1.70 | 0.00E+000 | 5.0 |
| TH-229 | T | 4.871 | 173.00 | 14.94 | 0.00 | 0.00E+000 | 19.4 |
| TH-230 | | 4.635 | 57.64 | 26.17 | 1.36 | 0.00E+000 | 4.0 |
| TH-232 | | 3.982 | 61.64 | 25.28 | 1.36 | 0.00E+000 | 7.5 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.994 | 5850.00* | 5.23E-002 +/- 5.22E-002 | 6.11E-002 +/- 9.86E-003 |
| TH-228 | 0.990 | 5400.00* | 7.13E-001 +/- 2.20E-001 | 9.14E-002 +/- 1.47E-002 |
| TH-229 | 1.000 | 4872.00* | 1.96E+000 +/- 3.16E-001 | 6.78E-002 +/- 1.09E-002 |
| TH-230 | 0.993 | 4672.00* | 6.50E-001 +/- 2.00E-001 | 7.73E-002 +/- 1.25E-002 |
| TH-232 | 0.999 | 3997.00* | 6.94E-001 +/- 2.08E-001 | 7.72E-002 +/- 1.25E-002 |

0000192403.CNF




0272

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 12

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 129: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 145: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 153: | 2 | 0 | 0 | 1 | 1 | 3 | 2 | 3 |
| 161: | 0 | 4 | 0 | 2 | 4 | 1 | 2 | 4 |
| 169: | 6 | 3 | 2 | 3 | 2 | 4 | 1 | 1 |
| 177: | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 193: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 1 | 2 | 0 | 2 | 3 | 0 | 1 |

Sample Title: 12

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 4 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |
| 385: | 1 | 2 | 2 | 2 | 0 | 2 | 2 | 3 |
| 393: | 0 | 1 | 3 | 4 | 1 | 1 | 2 | 1 |
| 401: | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 409: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 417: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 425: | 0 | 1 | 3 | 2 | 1 | 1 | 1 | 2 |
| 433: | 1 | 4 | 1 | 2 | 1 | 1 | 3 | 4 |
| 441: | 3 | 2 | 2 | 4 | 4 | 5 | 6 | 5 |
| 449: | 4 | 3 | 0 | 3 | 1 | 4 | 4 | 5 |
| 457: | 3 | 3 | 4 | 4 | 1 | 1 | 0 | 3 |
| 465: | 0 | 2 | 2 | 3 | 1 | 3 | 2 | 4 |
| 473: | 3 | 0 | 1 | 4 | 2 | 2 | 2 | 1 |
| 481: | 0 | 0 | 2 | 2 | 3 | 1 | 0 | 2 |
| 489: | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 3 |
| 497: | 3 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 505: | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 |
| 513: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 521: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 529: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 577: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 585: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| 601: | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 1 |
| 609: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 617: | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 1 |
| 625: | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 1 |
| 633: | 1 | 0 | 4 | 0 | 3 | 2 | 5 | 2 |
| 641: | 2 | 3 | 1 | 0 | 1 | 5 | 0 | 1 |
| 649: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 729: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 737: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 753: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 12

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 913: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KB 8/23/17

Sample Description: HTC-A03-S002-3642-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 13
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_046
Chamber Serial Number: 04026482B
Detector Serial Number: 58762
Env. Background: System Bkgd 194218
Reagent Blank: <not performed>

Sample Size: 1.190E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:16 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.234 mL
Effective Efficiency: 0.1563 +/- 0.0141
Counting Efficiency: 0.1713 +/- 0.0029 on 11/18/2016 10:08:38 AM
Chem. Recovery Factor: 0.9122 +/- 0.0840

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

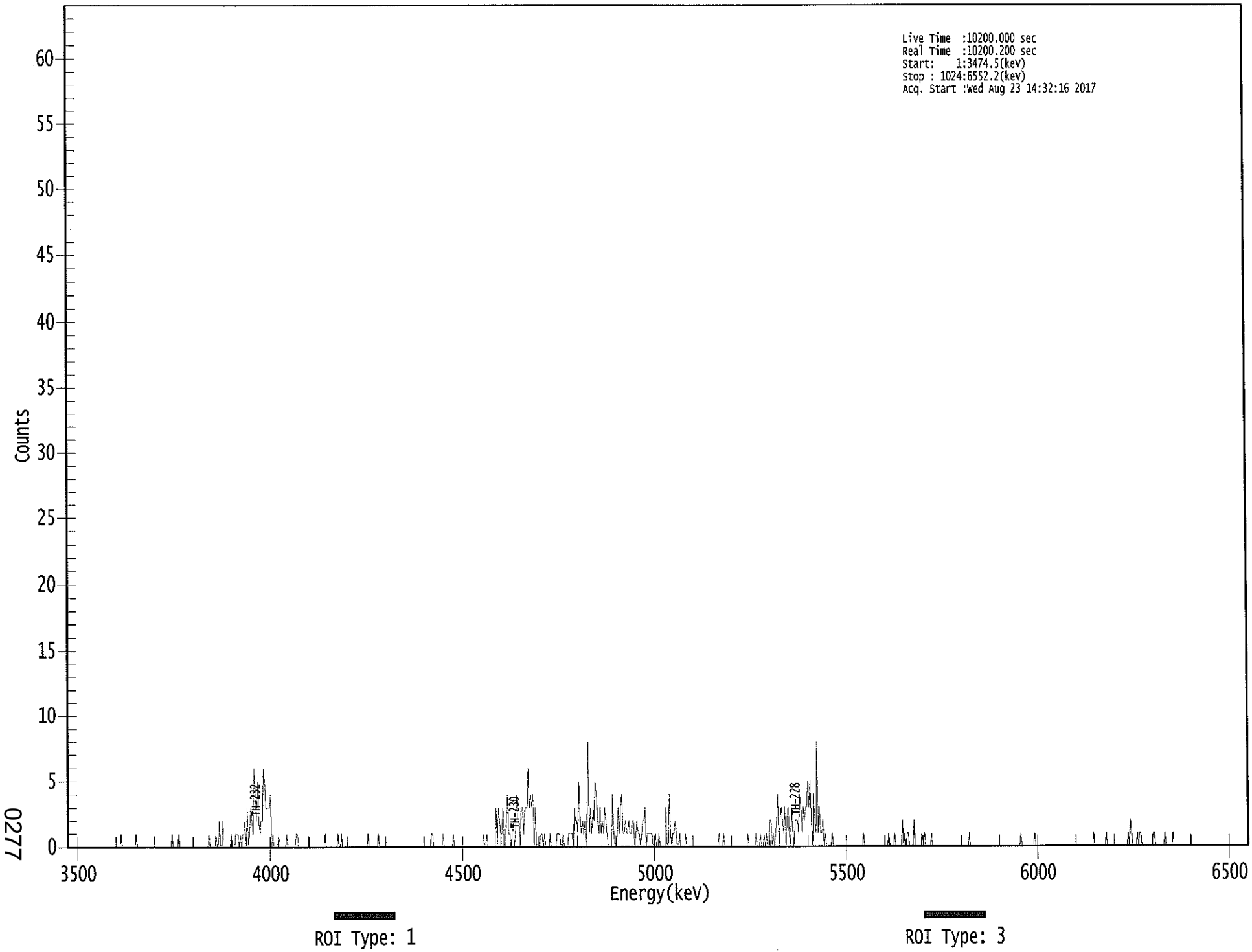
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.816 | 4.81 | 101.48 | 1.19 | 0.00E+000 | 3.0 |
| TH-228 | | 5.370 | 103.30 | 19.47 | 1.70 | 0.00E+000 | 3.4 |
| TH-229 | T | 4.890 | 139.81 | 16.66 | 1.19 | 0.00E+000 | 3.7 |
| TH-230 | | 4.640 | 78.47 | 22.38 | 1.53 | 0.00E+000 | 6.0 |
| TH-232 | | 3.965 | 79.64 | 22.18 | 1.36 | 0.00E+000 | 6.3 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.994 | 5850.00* | 7.09E-002 +/- 7.30E-002 | 9.71E-002 +/- 1.72E-002 |
| TH-228 | 0.995 | 5400.00* | 1.63E+000 +/- 4.28E-001 | 1.16E-001 +/- 2.05E-002 |
| TH-229 | 0.998 | 4872.00* | 2.00E+000 +/- 3.55E-001 | 9.43E-002 +/- 1.67E-002 |
| TH-230 | 0.995 | 4672.00* | 1.12E+000 +/- 3.20E-001 | 1.01E-001 +/- 1.80E-002 |
| TH-232 | 0.995 | 3997.00* | 1.13E+000 +/- 3.22E-001 | 9.77E-002 +/- 1.73E-002 |

0000192405.CNF




0277

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 13

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 97: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 129: | 1 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 145: | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 153: | 1 | 2 | 0 | 3 | 0 | 1 | 3 | 2 |
| 161: | 1 | 6 | 4 | 2 | 5 | 2 | 1 | 2 |
| 169: | 2 | 6 | 5 | 3 | 3 | 3 | 3 | 4 |
| 177: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 185: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 193: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 361: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 3 | 0 | 3 | 2 | 1 | 1 |

Sample Title: 13

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 3 | 0 | 0 | 2 | 4 | 1 | 1 | 0 |
| 385: | 1 | 2 | 0 | 1 | 4 | 2 | 2 | 0 |
| 393: | 3 | 3 | 1 | 3 | 3 | 3 | 6 | 3 |
| 401: | 4 | 3 | 4 | 0 | 3 | 0 | 0 | 0 |
| 409: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 417: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 425: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 433: | 0 | 1 | 1 | 1 | 1 | 0 | 3 | 2 |
| 441: | 2 | 1 | 5 | 2 | 1 | 2 | 1 | 2 |
| 449: | 0 | 2 | 8 | 1 | 3 | 1 | 3 | 2 |
| 457: | 5 | 4 | 2 | 1 | 3 | 1 | 2 | 1 |
| 465: | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 4 |
| 473: | 1 | 0 | 0 | 1 | 3 | 1 | 3 | 4 |
| 481: | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 |
| 489: | 2 | 2 | 0 | 1 | 2 | 1 | 1 | 0 |
| 497: | 1 | 2 | 2 | 3 | 0 | 1 | 1 | 1 |
| 505: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 513: | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| 521: | 4 | 1 | 0 | 1 | 1 | 2 | 1 | 0 |
| 529: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 601: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| 609: | 2 | 0 | 1 | 0 | 1 | 2 | 4 | 0 |
| 617: | 2 | 3 | 2 | 1 | 3 | 0 | 2 | 3 |
| 625: | 1 | 0 | 3 | 1 | 0 | 2 | 2 | 2 |
| 633: | 1 | 4 | 3 | 1 | 3 | 2 | 3 | 3 |
| 641: | 5 | 3 | 5 | 2 | 0 | 4 | 2 | 1 |
| 649: | 8 | 1 | 3 | 1 | 1 | 2 | 0 | 1 |
| 657: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 713: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 1 |
| 729: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 745: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 13

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 921: | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 929: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

ICP 9/23/17

Apex-Alpha™

Sample Description: HTC-A03-S002-4248-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 14
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_047
Chamber Serial Number: 02030596A
Detector Serial Number: 91086
Env. Background: System Bkgd 194219
Reagent Blank: <not performed>

Sample Size: 1.320E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:19 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.234 mL
Effective Efficiency: 0.1466 +/- 0.0136
Counting Efficiency: 0.1623 +/- 0.0028 on 11/18/2016 10:08:37 AM
Chem. Recovery Factor: 0.9031 +/- 0.0854

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

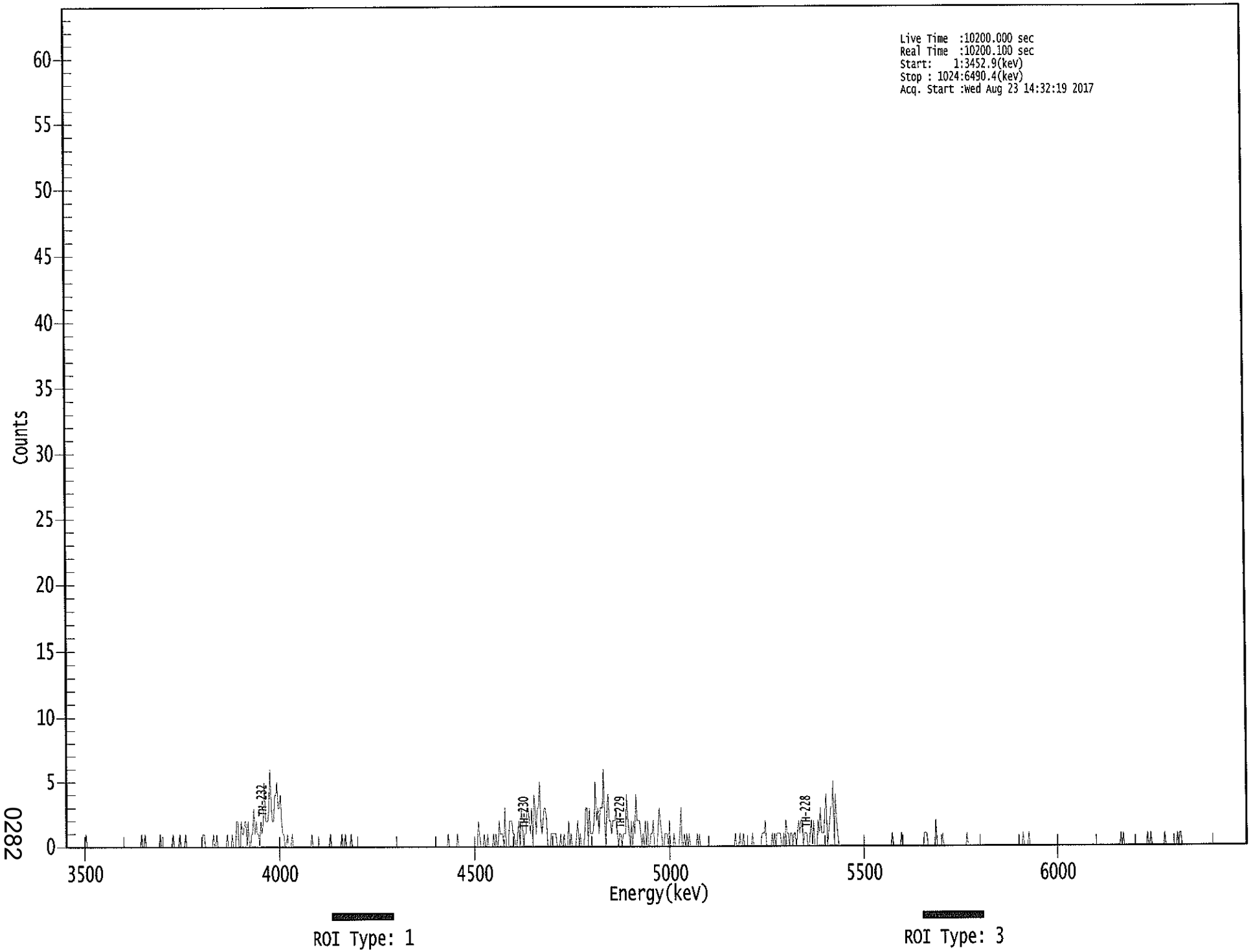
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.827 | 3.49 | 113.53 | 0.51 | 0.00E+000 | 3.0 |
| TH-228 | | 5.352 | 76.66 | 22.44 | 0.34 | 0.00E+000 | 8.9 |
| TH-229 | T | 4.876 | 131.15 | 17.18 | 0.85 | 0.00E+000 | 5.2 |
| TH-230 | | 4.628 | 84.66 | 21.35 | 0.34 | 0.00E+000 | 9.2 |
| TH-232 | | 3.958 | 91.83 | 20.48 | 0.17 | 0.00E+000 | 5.9 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.997 | 5850.00* | 4.95E-002 +/- 5.69E-002 | 7.44E-002 +/- 1.36E-002 |
| TH-228 | 0.988 | 5400.00* | 1.16E+000 +/- 3.36E-001 | 7.24E-002 +/- 1.32E-002 |
| TH-229 | 1.000 | 4872.00* | 1.81E+000 +/- 3.29E-001 | 8.24E-002 +/- 1.50E-002 |
| TH-230 | 0.990 | 4672.00* | 1.16E+000 +/- 3.26E-001 | 6.56E-002 +/- 1.20E-002 |
| TH-232 | 0.992 | 3997.00* | 1.26E+000 +/- 3.45E-001 | 5.72E-002 +/- 1.04E-002 |

0000192418.CNF




0282

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 14

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 97: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 129: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 145: | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 2 |
| 153: | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 0 |
| 161: | 1 | 1 | 3 | 1 | 2 | 1 | 1 | 0 |
| 169: | 2 | 1 | 2 | 5 | 2 | 2 | 2 | 3 |
| 177: | 6 | 3 | 2 | 2 | 4 | 4 | 5 | 3 |
| 185: | 3 | 4 | 2 | 1 | 1 | 0 | 0 | 1 |
| 193: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 241: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| 361: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 1 |

Sample Title: 14

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 2 |
| 385: | 2 | 2 | 1 | 1 | 0 | 0 | 1 | 2 |
| 393: | 0 | 3 | 2 | 0 | 1 | 1 | 3 | 3 |
| 401: | 2 | 1 | 3 | 0 | 4 | 3 | 1 | 3 |
| 409: | 3 | 5 | 2 | 1 | 2 | 3 | 3 | 2 |
| 417: | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 425: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 433: | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 441: | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 0 |
| 449: | 1 | 3 | 3 | 0 | 3 | 1 | 1 | 1 |
| 457: | 2 | 5 | 2 | 3 | 1 | 3 | 3 | 3 |
| 465: | 6 | 2 | 0 | 3 | 4 | 2 | 2 | 1 |
| 473: | 2 | 2 | 2 | 3 | 1 | 0 | 1 | 1 |
| 481: | 0 | 1 | 1 | 1 | 4 | 2 | 1 | 0 |
| 489: | 2 | 0 | 2 | 1 | 4 | 2 | 2 | 2 |
| 497: | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 |
| 505: | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 1 |
| 513: | 3 | 2 | 1 | 0 | 0 | 1 | 1 | 1 |
| 521: | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| 529: | 0 | 0 | 1 | 3 | 0 | 0 | 1 | 0 |
| 537: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 545: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 585: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 |
| 609: | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 617: | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 1 |
| 625: | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 633: | 1 | 2 | 1 | 2 | 2 | 0 | 1 | 1 |
| 641: | 1 | 0 | 0 | 1 | 2 | 0 | 2 | 0 |
| 649: | 0 | 0 | 2 | 1 | 3 | 1 | 1 | 1 |
| 657: | 3 | 4 | 0 | 1 | 2 | 3 | 3 | 5 |
| 665: | 0 | 4 | 2 | 1 | 0 | 0 | 0 | 0 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 745: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 753: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 14

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 833: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

| | |
|---|---|
| Sample Description: | HTC-A03-S003-0006-01 |
| Spectrum File: | \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924 |
| Batch Identification: | 1707087A-TH |
| Sample Identification: | 15 |
| Sample Geometry: | Shelf 2 |
| Procedure Description: | Th iso |
| Detector Name: | Alpha_048 |
| Chamber Serial Number: | 02030596B |
| Detector Serial Number: | 83111 |
| Env. Background: | System Bkgd 194220 |
| Reagent Blank: | <not performed> |
| Sample Size: | 1.210E+000 +/- 0.000E+000 gram |
| Sample Date/Time: | 5/15/2017 6:21:13 AM |
| Acquisition Date/Time: | 8/23/2017 2:32:21 PM |
| Acquisition Live Time: | 170.0 minutes |
| Acquisition Real Time: | 170.0 minutes |
| Tracer Certificate: | Th229_S_TH-18A |
| Tracer Quantity: | 0.234 mL |
| Effective Efficiency: | 0.1499 +/- 0.0138 |
| Counting Efficiency: | 0.1633 +/- 0.0028 on 11/18/2016 10:08:35 AM |
| Chem. Recovery Factor: | 0.9178 +/- 0.0859 |
| Peak Match Tolerance: | 0.175 MeV |

PEAK AREA REPORT

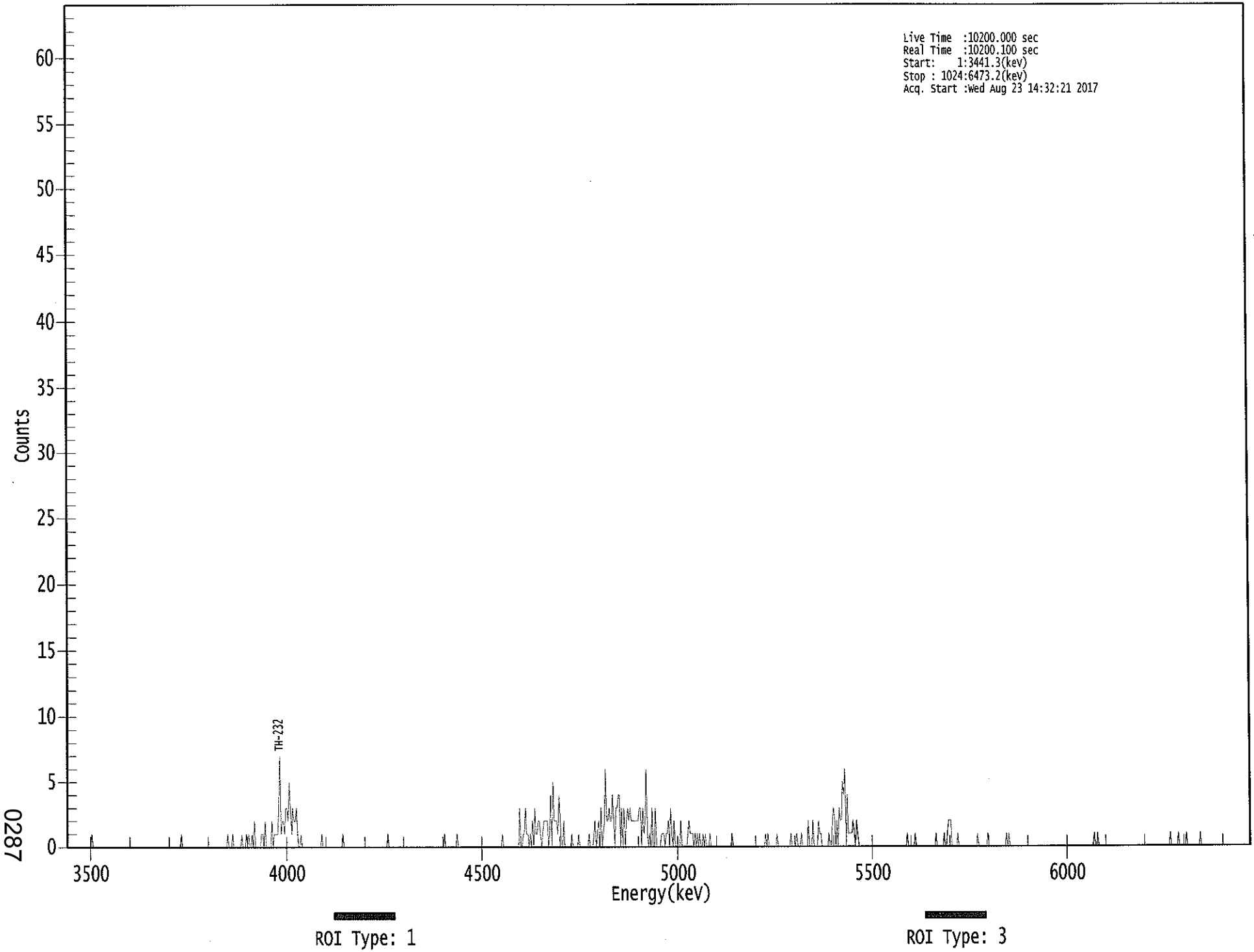
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.754 | 8.49 | 69.59 | 0.51 | 0.00E+000 | 0.0 |
| TH-228 | | 5.395 | 52.98 | 27.23 | 1.02 | 0.00E+000 | 9.4 |
| TH-229 | T | 4.891 | 134.15 | 16.98 | 0.85 | 0.00E+000 | 4.4 |
| TH-230 | | 4.654 | 58.66 | 25.68 | 0.34 | 0.00E+000 | 4.0 |
| TH-232 | | 3.984 | 62.98 | 24.93 | 1.02 | 0.00E+000 | 4.3 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.953 | 5850.00* | 1.28E-001 +/- 9.22E-002 | 7.93E-002 +/- 1.43E-002 |
| TH-228 | 1.000 | 5400.00* | 8.55E-001 +/- 2.79E-001 | 1.02E-001 +/- 1.84E-002 |
| TH-229 | 0.998 | 4872.00* | 1.97E+000 +/- 3.55E-001 | 8.79E-002 +/- 1.59E-002 |
| TH-230 | 0.998 | 4672.00* | 8.58E-001 +/- 2.69E-001 | 7.00E-002 +/- 1.26E-002 |
| TH-232 | 0.999 | 3997.00* | 9.20E-001 +/- 2.83E-001 | 9.20E-002 +/- 1.66E-002 |

0000192419.CNF




0287

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 15

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 153: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 161: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| 169: | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 177: | 2 | 0 | 1 | 1 | 1 | 1 | 3 | 7 |
| 185: | 1 | 2 | 2 | 1 | 3 | 3 | 2 | 5 |
| 193: | 3 | 1 | 3 | 2 | 2 | 3 | 1 | 0 |
| 201: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Sample Title: 15

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| 393: | 0 | 1 | 1 | 3 | 1 | 1 | 0 | 1 |
| 401: | 0 | 2 | 0 | 3 | 1 | 1 | 2 | 2 |
| 409: | 1 | 0 | 1 | 2 | 2 | 2 | 2 | 0 |
| 417: | 1 | 4 | 0 | 5 | 2 | 2 | 2 | 1 |
| 425: | 4 | 2 | 0 | 0 | 2 | 0 | 0 | 0 |
| 433: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 441: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 449: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| 457: | 0 | 1 | 2 | 0 | 3 | 0 | 1 | 2 |
| 465: | 6 | 2 | 2 | 3 | 2 | 2 | 4 | 2 |
| 473: | 0 | 3 | 3 | 4 | 4 | 0 | 3 | 0 |
| 481: | 3 | 0 | 2 | 3 | 2 | 3 | 2 | 2 |
| 489: | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 0 |
| 497: | 3 | 1 | 2 | 6 | 1 | 0 | 1 | 0 |
| 505: | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| 513: | 1 | 1 | 1 | 0 | 1 | 1 | 2 | 0 |
| 521: | 3 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| 529: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| 537: | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 545: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 553: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 633: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 641: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 649: | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 657: | 0 | 1 | 0 | 0 | 2 | 3 | 2 | 0 |
| 665: | 2 | 0 | 3 | 2 | 2 | 5 | 4 | 6 |
| 673: | 0 | 4 | 1 | 1 | 1 | 1 | 2 | 1 |
| 681: | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 753: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 761: | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| 769: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 15

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 889: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

Sample Description: HTC-A03-S003-0612-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 16
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_049
Chamber Serial Number: 10006121A
Detector Serial Number: 49
Env. Background: System Bkgd 194221
Reagent Blank: <not performed>

Sample Size: 1.480E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:49 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1548 +/- 0.0140
Counting Efficiency: 0.1488 +/- 0.0026 on 11/18/2016 3:34:20 PM
Chem. Recovery Factor: 1.0401 +/- 0.0959

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

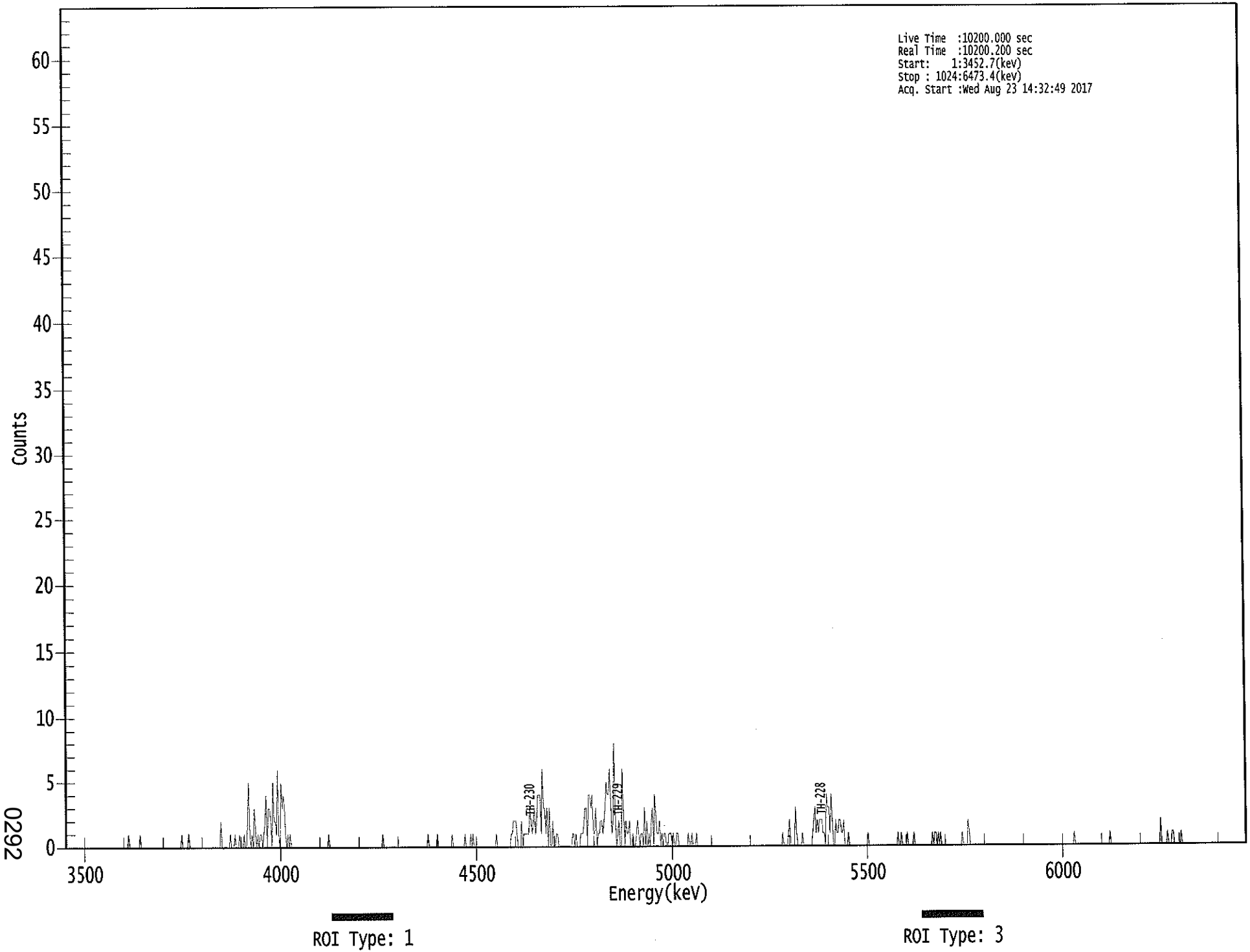
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.811 | 4.15 | 107.12 | 0.85 | 0.00E+000 | 4.4 |
| TH-228 | | 5.384 | 55.32 | 26.54 | 0.68 | 0.00E+000 | 8.9 |
| TH-229 | T | 4.865 | 138.66 | 16.67 | 0.34 | 0.00E+000 | 3.9 |
| TH-230 | | 4.640 | 70.66 | 23.38 | 0.34 | 0.00E+000 | 4.7 |
| TH-232 | | 3.966 | 71.32 | 23.34 | 0.68 | 0.00E+000 | 3.5 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.992 | 5850.00* | 4.97E-002 +/- 5.39E-002 | 7.16E-002 +/- 1.27E-002 |
| TH-228 | 0.999 | 5400.00* | 7.07E-001 +/- 2.26E-001 | 7.21E-002 +/- 1.28E-002 |
| TH-229 | 1.000 | 4872.00* | 1.61E+000 +/- 2.86E-001 | 5.56E-002 +/- 9.86E-003 |
| TH-230 | 0.995 | 4672.00* | 8.19E-001 +/- 2.40E-001 | 5.54E-002 +/- 9.83E-003 |
| TH-232 | 0.995 | 3997.00* | 8.25E-001 +/- 2.42E-001 | 6.52E-002 +/- 1.16E-002 |

0000192410.CNF




0292

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 16

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 105: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 145: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 153: | 0 | 0 | 1 | 0 | 0 | 2 | 5 | 1 |
| 161: | 0 | 1 | 0 | 3 | 1 | 0 | 1 | 0 |
| 169: | 1 | 1 | 0 | 1 | 2 | 4 | 0 | 3 |
| 177: | 3 | 2 | 0 | 5 | 2 | 2 | 1 | 6 |
| 185: | 1 | 0 | 5 | 3 | 4 | 3 | 1 | 0 |
| 193: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 353: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Sample Title: 16

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 0 |
| 393: | 0 | 0 | 2 | 0 | 1 | 1 | 1 | 1 |
| 401: | 1 | 3 | 2 | 1 | 2 | 3 | 1 | 2 |
| 409: | 4 | 4 | 4 | 1 | 6 | 3 | 3 | 1 |
| 417: | 3 | 0 | 3 | 0 | 0 | 2 | 0 | 0 |
| 425: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 433: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 441: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 449: | 2 | 3 | 3 | 0 | 4 | 4 | 3 | 4 |
| 457: | 1 | 1 | 3 | 0 | 1 | 1 | 2 | 2 |
| 465: | 1 | 2 | 3 | 5 | 4 | 4 | 6 | 3 |
| 473: | 1 | 2 | 8 | 2 | 0 | 1 | 2 | 0 |
| 481: | 0 | 6 | 3 | 0 | 2 | 1 | 1 | 2 |
| 489: | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 |
| 497: | 0 | 1 | 1 | 0 | 3 | 0 | 2 | 0 |
| 505: | 1 | 0 | 2 | 3 | 0 | 4 | 2 | 1 |
| 513: | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 0 |
| 521: | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 529: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 537: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 545: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 617: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 625: | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 3 |
| 633: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 641: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 649: | 3 | 1 | 2 | 1 | 2 | 2 | 2 | 1 |
| 657: | 1 | 0 | 4 | 3 | 3 | 1 | 4 | 2 |
| 665: | 0 | 0 | 2 | 1 | 1 | 2 | 2 | 1 |
| 673: | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 729: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 753: | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 16

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 953: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KS 8/22/18

Sample Description: HTC-A03-S003-1218-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 17
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_050
Chamber Serial Number: 10006121B
Detector Serial Number: 50
Env. Background: System Bkgd 194222
Reagent Blank: <not performed>

Sample Size: 1.130E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:52 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.235 mL
Effective Efficiency: 0.1596 +/- 0.0143
Counting Efficiency: 0.1433 +/- 0.0025 on 11/18/2016 3:34:18 PM
Chem. Recovery Factor: 1.1144 +/- 0.1016

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

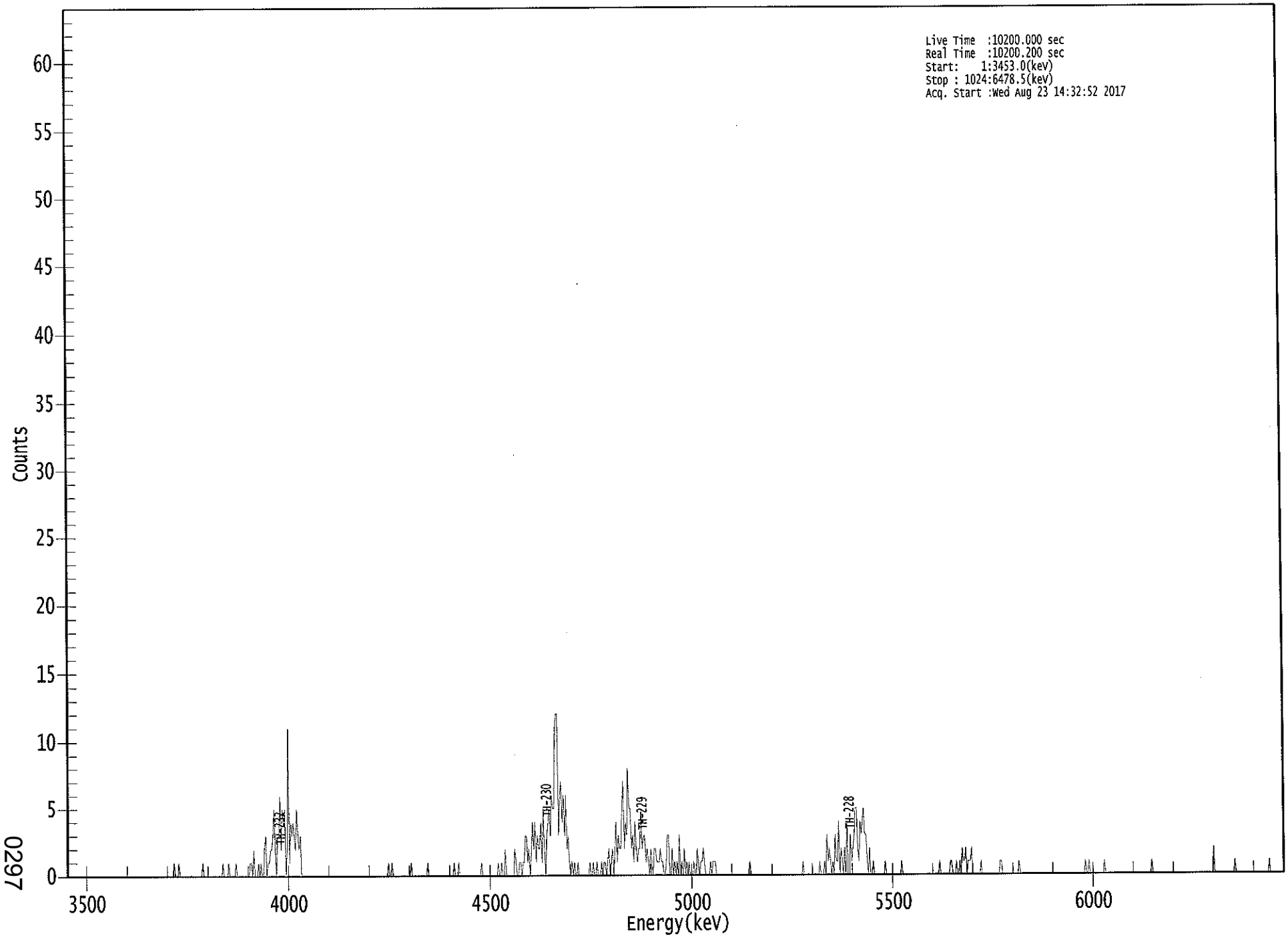
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.831 | 7.47 | 79.84 | 1.53 | 0.00E+000 | 3.0 |
| TH-228 | | 5.395 | 72.94 | 23.51 | 3.06 | 0.00E+000 | 9.9 |
| TH-229 | T | 4.880 | 143.47 | 16.47 | 1.53 | 0.00E+000 | 9.3 |
| TH-230 | | 4.645 | 162.13 | 15.50 | 1.87 | 0.00E+000 | 10.4 |
| TH-232 | | 3.982 | 99.98 | 19.72 | 1.02 | 0.00E+000 | 3.4 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.998 | 5850.00* | 1.14E-001 +/- 9.28E-002 | 1.08E-001 +/- 1.90E-002 |
| TH-228 | 1.000 | 5400.00* | 1.18E+000 +/- 3.47E-001 | 1.45E-001 +/- 2.54E-002 |
| TH-229 | 1.000 | 4872.00* | 2.12E+000 +/- 3.72E-001 | 1.05E-001 +/- 1.84E-002 |
| TH-230 | 0.996 | 4672.00* | 2.39E+000 +/- 5.59E-001 | 1.11E-001 +/- 1.96E-002 |
| TH-232 | 0.999 | 3997.00* | 1.47E+000 +/- 3.88E-001 | 9.25E-002 +/- 1.62E-002 |

0000192413.CNF




0297

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 17

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 137: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 |
| 161: | 1 | 0 | 1 | 0 | 0 | 2 | 3 | 0 |
| 169: | 1 | 1 | 2 | 2 | 3 | 5 | 2 | 0 |
| 177: | 3 | 3 | 6 | 2 | 5 | 4 | 5 | 0 |
| 185: | 2 | 11 | 1 | 4 | 3 | 4 | 3 | 2 |
| 193: | 5 | 3 | 2 | 3 | 0 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 273: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 329: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

Sample Title: 17

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 385: | 3 | 3 | 1 | 2 | 0 | 2 | 4 | 2 |
| 393: | 4 | 1 | 3 | 2 | 2 | 4 | 1 | 5 |
| 401: | 2 | 0 | 3 | 4 | 5 | 3 | 6 | 5 |
| 409: | 5 | 11 | 12 | 12 | 3 | 6 | 7 | 4 |
| 417: | 6 | 3 | 6 | 2 | 3 | 1 | 0 | 1 |
| 425: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 433: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 441: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 449: | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 |
| 457: | 1 | 2 | 0 | 2 | 4 | 1 | 3 | 2 |
| 465: | 2 | 5 | 7 | 2 | 4 | 3 | 8 | 5 |
| 473: | 5 | 2 | 3 | 1 | 4 | 2 | 1 | 2 |
| 481: | 2 | 5 | 2 | 3 | 3 | 1 | 2 | 1 |
| 489: | 0 | 2 | 1 | 0 | 2 | 2 | 1 | 1 |
| 497: | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 3 |
| 505: | 3 | 0 | 0 | 2 | 0 | 1 | 0 | 1 |
| 513: | 0 | 3 | 0 | 1 | 0 | 2 | 0 | 1 |
| 521: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 529: | 2 | 1 | 0 | 1 | 1 | 2 | 1 | 0 |
| 537: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |
| 545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 617: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 633: | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 2 |
| 641: | 1 | 0 | 1 | 0 | 3 | 1 | 1 | 4 |
| 649: | 0 | 2 | 1 | 0 | 2 | 0 | 4 | 0 |
| 657: | 0 | 3 | 1 | 2 | 3 | 5 | 5 | 2 |
| 665: | 1 | 4 | 3 | 4 | 5 | 3 | 3 | 1 |
| 673: | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 745: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 753: | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 2 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 785: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 17

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 857: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

KD 8/23/17

| | |
|---|---|
| Sample Description: | HTC-A03-S003-1824-01 |
| Spectrum File: | \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924 |
| Batch Identification: | 1707087A-TH |
| Sample Identification: | 18 |
| Sample Geometry: | Shelf 2 |
| Procedure Description: | Th iso |
| Detector Name: | Alpha_052 |
| Chamber Serial Number: | 10006123B |
| Detector Serial Number: | 52 |
| Env. Background: | System Bkgd 194223 |
| Reagent Blank: | <not performed> |
| Sample Size: | 1.250E+000 +/- 0.000E+000 gram |
| Sample Date/Time: | 5/15/2017 6:21:13 AM |
| Acquisition Date/Time: | 8/23/2017 2:32:55 PM |
| Acquisition Live Time: | 170.0 minutes |
| Acquisition Real Time: | 170.0 minutes |
| Tracer Certificate: | Th229_S_TH-18A |
| Tracer Quantity: | 0.235 mL |
| Effective Efficiency: | 0.1269 +/- 0.0126 |
| Counting Efficiency: | 0.1737 +/- 0.0030 on 11/18/2016 3:34:15 PM |
| Chem. Recovery Factor: | 0.7304 +/- 0.0733 |
| Peak Match Tolerance: | 0.175 MeV |

PEAK AREA REPORT

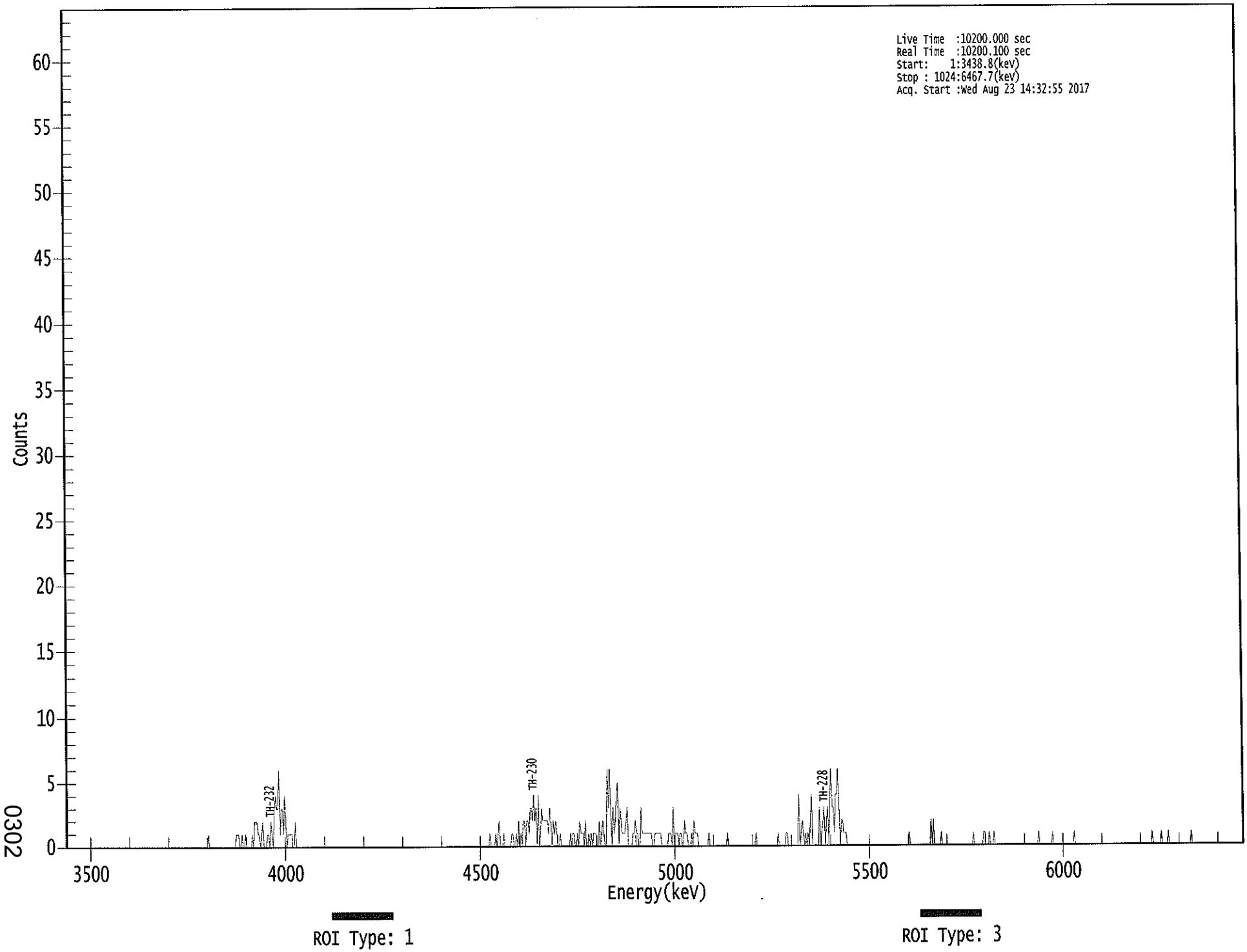
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.867 | 7.66 | 72.63 | 0.34 | 0.00E+000 | 3.0 |
| TH-228 | | 5.384 | 74.66 | 22.74 | 0.34 | 0.00E+000 | 6.7 |
| TH-229 | T | 4.885 | 113.66 | 18.42 | 0.34 | 0.00E+000 | 4.4 |
| TH-230 | | 4.639 | 67.81 | 24.04 | 1.19 | 0.00E+000 | 5.9 |
| TH-232 | | 3.964 | 61.49 | 25.12 | 0.51 | 0.00E+000 | 4.7 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.998 | 5850.00* | 1.32E-001 +/- 9.95E-002 | 8.26E-002 +/- 1.60E-002 |
| TH-228 | 0.999 | 5400.00* | 1.38E+000 +/- 4.12E-001 | 8.83E-002 +/- 1.71E-002 |
| TH-229 | 0.999 | 4872.00* | 1.91E+000 +/- 3.70E-001 | 8.02E-002 +/- 1.56E-002 |
| TH-230 | 0.994 | 4672.00* | 1.13E+000 +/- 3.51E-001 | 1.10E-001 +/- 2.14E-002 |
| TH-232 | 0.994 | 3997.00* | 1.03E+000 +/- 3.26E-001 | 8.77E-002 +/- 1.70E-002 |

0000192414.CNF




0302

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 18

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 153: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 161: | 0 | 1 | 0 | 2 | 2 | 2 | 1 | 1 |
| 169: | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 1 |
| 177: | 0 | 2 | 1 | 0 | 3 | 4 | 3 | 3 |
| 185: | 6 | 1 | 3 | 3 | 1 | 4 | 2 | 0 |
| 193: | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |

Sample Title: 18

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 393: | 2 | 0 | 1 | 0 | 2 | 2 | 0 | 2 |
| 401: | 2 | 1 | 3 | 3 | 2 | 4 | 2 | 3 |
| 409: | 0 | 4 | 0 | 1 | 3 | 2 | 2 | 2 |
| 417: | 2 | 2 | 1 | 3 | 2 | 0 | 2 | 1 |
| 425: | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 433: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 441: | 1 | 0 | 0 | 1 | 0 | 2 | 1 | 1 |
| 449: | 1 | 0 | 2 | 0 | 0 | 1 | 0 | 1 |
| 457: | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 0 |
| 465: | 1 | 2 | 1 | 0 | 0 | 6 | 3 | 6 |
| 473: | 3 | 0 | 3 | 1 | 2 | 4 | 5 | 0 |
| 481: | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 0 |
| 489: | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 1 |
| 497: | 0 | 0 | 3 | 1 | 1 | 1 | 1 | 1 |
| 505: | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 513: | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 521: | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 0 |
| 529: | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 537: | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 545: | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 617: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 4 | 0 | 1 | 2 | 1 |
| 641: | 0 | 1 | 0 | 1 | 0 | 2 | 4 | 0 |
| 649: | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 |
| 657: | 2 | 3 | 0 | 2 | 3 | 0 | 4 | 6 |
| 665: | 3 | 3 | 1 | 4 | 4 | 6 | 3 | 0 |
| 673: | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 753: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |

Sample Title: 18

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 953: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 977: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

KG 9/23/17

Apex-Alpha™

Sample Description: HTC-A03-S003-2430-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 19
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_053
Chamber Serial Number: 10006122A
Detector Serial Number: 53
Env. Background: System Bkgd 194224
Reagent Blank: <not performed>

Sample Size: 1.120E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:32:58 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.234 mL
Effective Efficiency: 0.2282 +/- 0.0175
Counting Efficiency: 0.1515 +/- 0.0026 on 11/18/2016 3:34:14 PM
Chem. Recovery Factor: 1.5065 +/- 0.1184

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

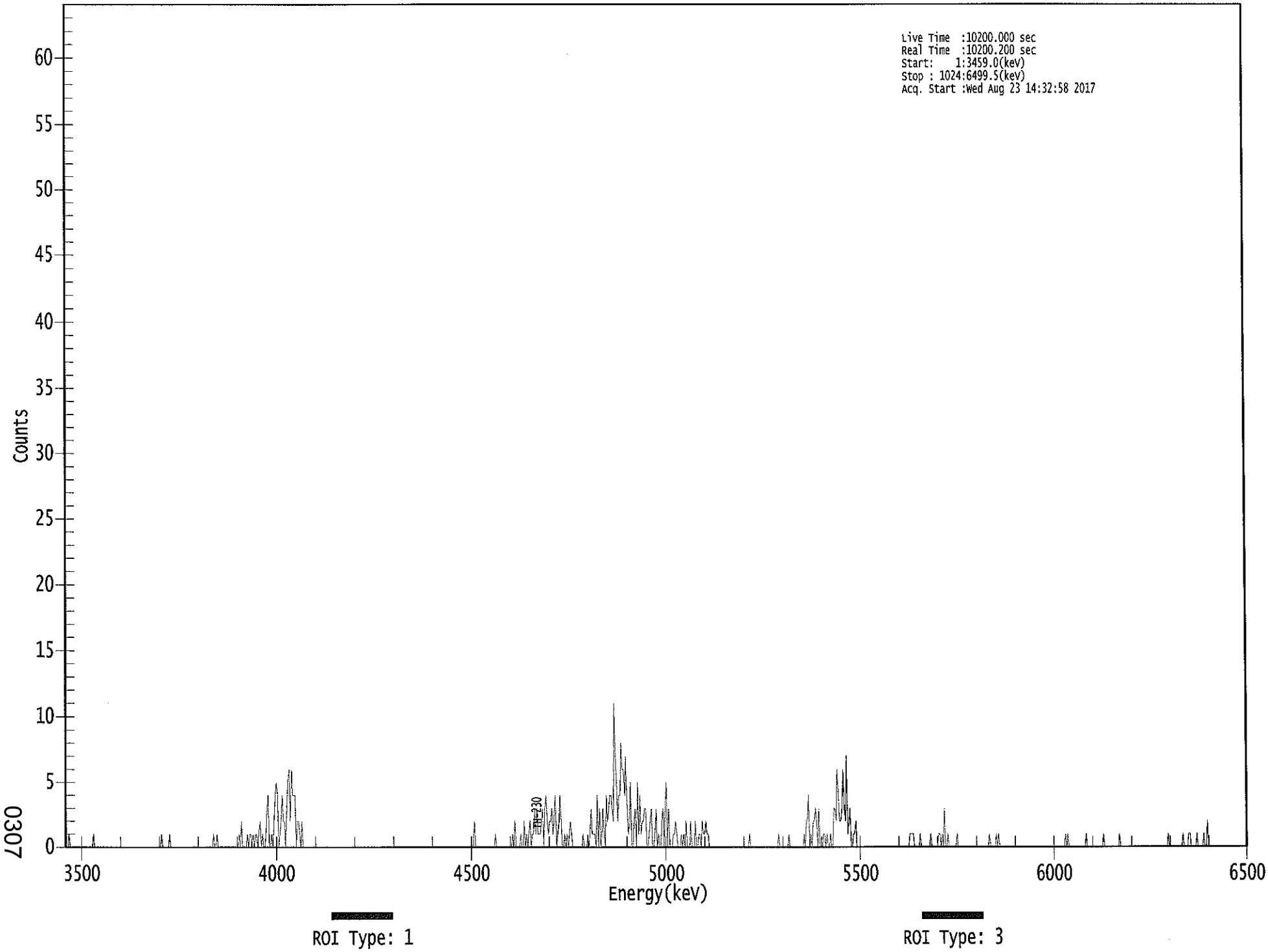
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.797 | 12.83 | 55.14 | 0.17 | 0.00E+000 | 3.0 |
| TH-228 | | 5.399 | 48.15 | 28.54 | 0.85 | 0.00E+000 | 6.7 |
| TH-229 | T | 4.901 | 203.66 | 13.75 | 0.34 | 0.00E+000 | 7.0 |
| TH-230 | | 4.671 | 54.15 | 26.88 | 0.85 | 0.00E+000 | 6.9 |
| TH-232 | | 4.006 | 90.66 | 20.63 | 0.34 | 0.00E+000 | 8.2 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.985 | 5850.00* | 1.38E-001 +/- 7.87E-002 | 4.48E-002 +/- 6.73E-003 |
| TH-228 | 1.000 | 5400.00* | 5.52E-001 +/- 1.78E-001 | 6.86E-002 +/- 1.03E-002 |
| TH-229 | 0.996 | 4872.00* | 2.12E+000 +/- 3.19E-001 | 4.98E-002 +/- 7.49E-003 |
| TH-230 | 1.000 | 4672.00* | 5.62E-001 +/- 1.73E-001 | 6.22E-002 +/- 9.35E-003 |
| TH-232 | 1.000 | 3997.00* | 9.40E-001 +/- 2.40E-001 | 4.96E-002 +/- 7.45E-003 |

0000192417.CNF




0307

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 19

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 153: | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 161: | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 169: | 2 | 0 | 1 | 0 | 0 | 1 | 3 | 4 |
| 177: | 0 | 0 | 1 | 0 | 2 | 4 | 5 | 4 |
| 185: | 0 | 1 | 2 | 4 | 2 | 2 | 0 | 3 |
| 193: | 5 | 6 | 2 | 6 | 4 | 4 | 4 | 0 |
| 201: | 2 | 2 | 1 | 0 | 2 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

Sample Title: 19

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 385: | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 |
| 393: | 0 | 1 | 0 | 0 | 2 | 0 | 1 | 0 |
| 401: | 1 | 2 | 0 | 1 | 1 | 3 | 1 | 3 |
| 409: | 1 | 1 | 1 | 2 | 3 | 0 | 3 | 4 |
| 417: | 2 | 1 | 2 | 2 | 3 | 1 | 2 | 4 |
| 425: | 0 | 1 | 2 | 4 | 2 | 0 | 0 | 1 |
| 433: | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 0 |
| 441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 449: | 0 | 0 | 0 | 1 | 0 | 1 | 3 | 1 |
| 457: | 1 | 1 | 0 | 4 | 0 | 3 | 0 | 1 |
| 465: | 3 | 1 | 0 | 4 | 2 | 3 | 4 | 4 |
| 473: | 3 | 2 | 11 | 7 | 5 | 2 | 4 | 4 |
| 481: | 8 | 6 | 6 | 4 | 7 | 3 | 1 | 2 |
| 489: | 5 | 0 | 0 | 2 | 3 | 0 | 5 | 1 |
| 497: | 4 | 1 | 2 | 2 | 3 | 3 | 0 | 0 |
| 505: | 1 | 2 | 3 | 0 | 0 | 1 | 3 | 0 |
| 513: | 1 | 0 | 0 | 2 | 3 | 0 | 3 | 5 |
| 521: | 0 | 3 | 0 | 0 | 0 | 1 | 1 | 2 |
| 529: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 537: | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 545: | 2 | 0 | 0 | 1 | 1 | 0 | 2 | 1 |
| 553: | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 617: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 633: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 641: | 2 | 2 | 4 | 0 | 1 | 0 | 2 | 2 |
| 649: | 3 | 2 | 0 | 3 | 0 | 0 | 0 | 1 |
| 657: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 665: | 3 | 3 | 2 | 6 | 4 | 2 | 2 | 3 |
| 673: | 6 | 3 | 2 | 7 | 1 | 2 | 3 | 0 |
| 681: | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| 737: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 745: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 753: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 761: | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

Sample Title: 19

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 953: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 969: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 977: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 985: | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Apex-Alpha™

NB 8/23/17

Sample Description: HTC-A03-S003-3036-01
Spectrum File: \\OR-ALPHA1\Canberra\ApexAlpha\Root\Data\00001924
Batch Identification: 1707087A-TH
Sample Identification: 20
Sample Geometry: Shelf 2
Procedure Description: Th iso

Detector Name: Alpha_054
Chamber Serial Number: 10006122B
Detector Serial Number: 54
Env. Background: System Bkgd 194225
Reagent Blank: <not performed>

Sample Size: 1.220E+000 +/- 0.000E+000 gram
Sample Date/Time: 5/15/2017 6:21:13 AM
Acquisition Date/Time: 8/23/2017 2:33:00 PM
Acquisition Live Time: 170.0 minutes
Acquisition Real Time: 170.0 minutes

Tracer Certificate: Th229_S_TH-18A
Tracer Quantity: 0.234 mL
Effective Efficiency: 0.1106 +/- 0.0117
Counting Efficiency: 0.1363 +/- 0.0024 on 11/18/2016 3:34:12 PM
Chem. Recovery Factor: 0.8111 +/- 0.0868

Peak Match Tolerance: 0.175 MeV

PEAK AREA REPORT

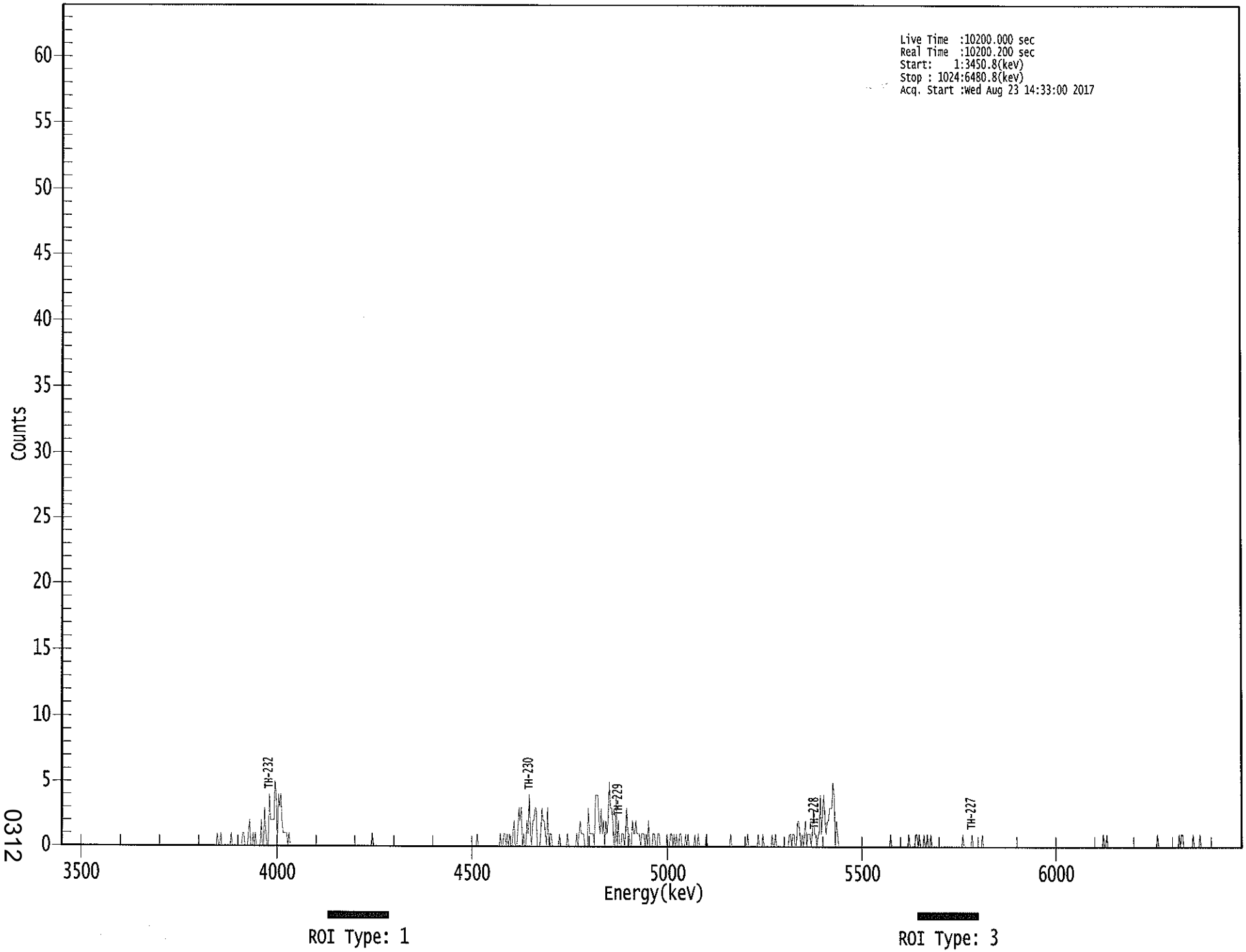
| Nuclide | | Energy (MeV) | Net Pk Area | Pk Area Error % | Ambient Backgnd | Reagent Backgnd | FWHM (keV) |
|---|---|---|---|---|---|---|---|
| TH-227 | | 5.786 | 2.66 | 128.85 | 0.34 | 0.00E+000 | 3.0 |
| TH-228 | | 5.379 | 67.62 | 24.32 | 2.38 | 0.00E+000 | 14.4 |
| TH-229 | T | 4.877 | 98.66 | 19.77 | 0.34 | 0.00E+000 | 9.9 |
| TH-230 | | 4.647 | 51.15 | 27.67 | 0.85 | 0.00E+000 | 3.9 |
| TH-232 | | 3.980 | 54.66 | 26.61 | 0.34 | 0.00E+000 | 6.5 |

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

| Nuclide | Id Conf. | Energy (keV) | Activity (pCi/gram ) | MDA (pCi/gram ) |
|---|---|---|---|---|
| TH-227 | 0.979 | 5850.00* | 5.41E-002 +/- 7.05E-002 | 9.72E-002 +/- 2.01E-002 |
| TH-228 | 0.998 | 5400.00* | 1.47E+000 +/- 4.69E-001 | 1.78E-001 +/- 3.68E-002 |
| TH-229 | 1.000 | 4872.00* | 1.95E+000 +/- 4.03E-001 | 9.44E-002 +/- 1.95E-002 |
| TH-230 | 0.997 | 4672.00* | 1.01E+000 +/- 3.48E-001 | 1.18E-001 +/- 2.44E-002 |
| TH-232 | 0.999 | 3997.00* | 1.07E+000 +/- 3.62E-001 | 9.39E-002 +/- 1.94E-002 |

# 0000192411.CNF




0312

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: 20

Elapsed Live time: 10200
Elapsed Real Time: 10200

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 33: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 41: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 49: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 57: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 65: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 73: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 81: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 89: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 129: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 137: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 145: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 153: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 161: | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 1 |
| 169: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 3 |
| 177: | 1 | 0 | 0 | 4 | 2 | 2 | 2 | 2 |
| 185: | 5 | 4 | 0 | 4 | 3 | 4 | 2 | 1 |
| 193: | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 265: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 20

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 385: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 2 |
| 393: | 0 | 0 | 1 | 3 | 2 | 3 | 0 | 1 |
| 401: | 0 | 0 | 2 | 1 | 4 | 1 | 0 | 2 |
| 409: | 2 | 3 | 3 | 0 | 0 | 0 | 1 | 3 |
| 417: | 2 | 2 | 1 | 0 | 3 | 0 | 1 | 1 |
| 425: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 433: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 441: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 449: | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 3 |
| 457: | 1 | 1 | 1 | 1 | 0 | 4 | 4 | 4 |
| 465: | 2 | 1 | 3 | 1 | 2 | 0 | 2 | 1 |
| 473: | 2 | 5 | 3 | 3 | 2 | 0 | 0 | 4 |
| 481: | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 1 |
| 489: | 3 | 1 | 1 | 0 | 0 | 2 | 1 | 1 |
| 497: | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 505: | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 |
| 513: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 521: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 529: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 537: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 545: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 553: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 577: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 593: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 601: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 609: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 617: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 625: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 633: | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 0 |
| 641: | 1 | 0 | 1 | 2 | 0 | 1 | 1 | 1 |
| 649: | 0 | 1 | 3 | 1 | 1 | 0 | 1 | 1 |
| 657: | 4 | 1 | 3 | 4 | 2 | 1 | 2 | 2 |
| 665: | 3 | 3 | 3 | 5 | 4 | 0 | 2 | 1 |
| 673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 713: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 729: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 737: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 745: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 753: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 777: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 785: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 793: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: 20

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 897: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 905: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 945: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 969: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 977: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 985: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

8/23/2017 6:33:03 AM

Apex-Alpha™

# QA SUMMARY REPORT

## Review Of QA Results - Pulser Check

Date : 8/23/2017
Time : 6:33:03 AM

| CHAMBER | DEVICE | PARAMETER | FLAG | DATE |
|---|---|---|---|---|
| Alpha_001 | 21f | ALL | Not Done | |
| Alpha_002 | 21f | ALL | Not Done | |
| Alpha_003 | 21f | ALL | Passed | 8/23/2017 5:22:00 AM |
| Alpha_004 | 21f | ALL | Passed | 8/23/2017 5:22:01 AM |
| Alpha_005 | 21f | ALL | Not Done | |
| Alpha_006 | 21f | ALL | Not Done | |
| Alpha_007 | 21f | ALL | Not Done | |
| Alpha_008 | 21f | ALL | Not Done | |
| Alpha_009 | 21f | ALL | Not Done | |
| Alpha_010 | 21f | ALL | Passed | 8/23/2017 5:22:02 AM |
| Alpha_011 | 21f | ALL | Passed | 8/23/2017 5:22:02 AM |
| Alpha_012 | 21f | ALL | Passed | 8/23/2017 5:22:03 AM |
| Alpha_013 | 21f | ALL | Not Done | |
| Alpha_014 | 21f | ALL | Passed | 8/23/2017 5:22:04 AM |
| Alpha_015 | 21f | Peak FWHM | Action | 8/18/2017 4:58:23 AM |
| Alpha_016 | 21f | ALL | Not Done | |
| Alpha_033 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:05 AM |
| Alpha_034 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:07 AM |
| Alpha_035 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:08 AM |
| Alpha_036 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:10 AM |
| Alpha_037 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:12 AM |
| Alpha_038 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:14 AM |
| Alpha_039 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:16 AM |
| Alpha_040 | Alpha Analyst100DC | Peak FWHM | Action | 8/23/2017 5:22:18 AM |
| Alpha_041 | Alpha Analyst100DC | ALL | Not Done | |
| Alpha_042 | Alpha Analyst100DC | ALL | Not Done | |
| Alpha_043 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:20 AM |
| Alpha_044 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:23 AM |
| Alpha_045 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:25 AM |
| Alpha_046 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:27 AM |
| Alpha_047 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:30 AM |
| Alpha_048 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:32 AM |
| Alpha_049 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:35 AM |
| Alpha_050 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:38 AM |
| Alpha_051 | Alpha Analyst100DC | ALL | Passed | 8/18/2017 4:59:01 AM |
| Alpha_052 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:40 AM |
| Alpha_053 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:43 AM |
| Alpha_054 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:46 AM |
| Alpha_055 | Alpha Analyst100DC | ALL | Passed | 8/18/2017 4:59:12 AM |
| Alpha_056 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:48 AM |
| Alpha_057 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:51 AM |
| Alpha_058 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:54 AM |

Review of QA Results - Pulser Check

8/23/2017 6:33:03 AM

| CHAMBER | DEVICE | PARAMETER | FLAG | DATE |
|---|---|---|---|---|
| Alpha_059 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:22:57 AM |
| Alpha_060 | Alpha Analyst100DC | ALL | Passed | 8/23/2017 5:23:00 AM |

**APPROVED BY:** _____

**APPROVAL DATE:** 8/23/17

```
*********************************************************************
*****          L I B R A R Y   L I S T I N G   R E P O R T        *****
*********************************************************************
```

Nuclide Library Title: Thorium

Nuclide Library Description: Th-227,-228,-229,-230,-232

| Nuclide Name | Half-Life (Seconds) | Energy (keV ) | Energy Uncert. (keV ) | Yield (%) | Yield Uncert.(Abs.+-) |
|---|---|---|---|---|---|
| TH-227 | 6.873E+008 | 5850.000* | 0.000 | 97.5000 | 0.0000 |
| TH-228 | 6.034E+007 | 5400.000* | 0.000 | 99.9400 | 0.0000 |
| TH-229 | 2.487E+011 | 4872.000* | 0.000 | 99.5200 | 0.0000 |
| TH-230 | 2.379E+012 | 4672.000* | 0.000 | 99.8200 | 0.0000 |
| TH-232 | 4.434E+017 | 3997.000* | 0.000 | 100.0000 | 0.0000 |

* = key line

TOTALS: 5 Nuclides 5 Energy Lines

# SECTION X

# ANALYTICAL DATA (GAMMA SPECTROSCOPY)

# 17-07087
## Gamma
### Run 2



| | |
|---|---|
| Work Order | 17-07087 |
| Analysis Code | Gamma |
| Run | 2 |
| Date Received | 7/18/2017 |
| Lab Deadline | 8/10/2017 |
| Client | Weston Solutions, Inc. |
| Project | 94759 |
| Report Level | 4 |
| Activity Units | pCi |
| Aliquot Units | g |
| Matrix | SO |
| Method | EPA 901.1 Modified |
| Instrument Type | Gamma Spectroscopy |
| Radiometric Tracer | |
| Radiometric Sol# | |
| Tracer Act (dpm/g) | |
| Carrier | |
| Carrier Conc (mg/ml) | |
| | |
| | |
| | |

| Internal Fraction | Sample Desc | Client ID | Login CPM | Sample Date | Sample Aliquot |
|---|---|---|---|---|---|
| 01 | LCS | LCS | | 07/19/17 00:00 | 1.0000E+00 |
| 02 | MBL | BLANK | | 07/19/17 00:00 | 1.0000E+00 |
| 03 | DUP | HTC-A03-S003-1218-01 | 39 | 05/15/17 08:42 | 6.9577E+02 |
| 04 | TRG | HTC-A03-S002-0006-01 | 49 | 05/15/17 09:39 | 6.9577E+02 |
| 05 | TRG | HTC-A03-S002-0612-01 | 32 | 05/15/17 09:36 | 8.2680E+02 |
| 06 | TRG | HTC-A03-S002-1218-01 | 51 | 05/15/17 09:33 | 7.7325E+02 |
| 07 | TRG | HTC-A03-S002-1824-01 | 37 | 05/15/17 09:27 | 6.4392E+02 |
| 08 | TRG | HTC-A03-S002-2430-01 | 39 | 05/15/17 09:24 | 6.2554E+02 |
| 09 | TRG | HTC-A03-S002-3036-01 | 48 | 05/15/17 09:21 | 6.9479E+02 |
| 12 | TRG | HTC-A03-S002-3036-02 | 35 | 05/15/17 09:21 | 6.8256E+02 |
| 13 | TRG | HTC-A03-S002-3642-01 | 45 | 05/15/17 09:18 | 6.4426E+02 |
| 14 | TRG | HTC-A03-S002-4248-01 | 37 | 05/15/17 09:15 | 6.7379E+02 |
| 15 | TRG | HTC-A03-S003-0006-01 | 33 | 05/15/17 08:48 | 6.0170E+02 |
| 16 | TRG | HTC-A03-S003-0612-01 | 33 | 05/15/17 08:45 | 6.7368E+02 |
| 17 | DO | HTC-A03-S003-1218-01 | 39 | 05/15/17 08:42 | 6.8289E+02 |
| 18 | TRG | HTC-A03-S003-1824-01 | 42 | 05/15/17 08:39 | 7.0790E+02 |
| 19 | TRG | HTC-A03-S003-2430-01 | 40 | 05/15/17 08:36 | 6.0589E+02 |
| 20 | TRG | HTC-A03-S003-3036-01 | 47 | 05/15/17 08:33 | 6.8389E+02 |
| | | | | | |
| | | | | | |

0320

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Eberline Services
Oak Ridge Laboratory
Analysis Sheet

# 17-07087
## Gamma
Run 2



| Internal Fraction | Sample Desc | Tracer Aliquot (g) | Tracer Total ACT (dpm) | Radiometric Tracer (pCi) | Radiometric % Rec | Grav Carrier Added (ml) | Grav Filter Tare (g) | Grav Filter Final (g) | Grav Filter Net (g) | Grav % Rec | Mean % Rec | SAF 1* | SAF 2* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | | | | 0.00 | | | | | | | | |
| 02 | MBL | | | | 0.00 | | | | | | | | |
| 03 | DUP | | | | 0.00 | | | | | | | | |
| 04 | TRG | | | | 0.00 | | | | | | | | |
| 05 | TRG | | | | 0.00 | | | | | | | | |
| 06 | TRG | | | | 0.00 | | | | | | | | |
| 07 | TRG | | | | 0.00 | | | | | | | | |
| 08 | TRG | | | | 0.00 | | | | | | | | |
| 09 | TRG | | | | 0.00 | | | | | | | | |
| 12 | TRG | | | | 0.00 | | | | | | | | |
| 13 | TRG | | | | 0.00 | | | | | | | | |
| 14 | TRG | | | | 0.00 | | | | | | | | |
| 15 | TRG | | | | 0.00 | | | | | | | | |
| 16 | TRG | | | | 0.00 | | | | | | | | |
| 17 | DO | | | | 0.00 | | | | | | | | |
| 18 | TRG | | | | 0.00 | | | | | | | | |
| 19 | TRG | | | | 0.00 | | | | | | | | |
| 20 | TRG | | | | 0.00 | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

0321

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

# 17-07087
## Gamma
Run 2



| Internal Fraction | Sample Desc | Rough Prep Date | Rough Prep By | Prep Date | Prep By | Sep t0 Date/Time | Sep t0 By | Sep t1 Date/Time | Sep t1 By |
|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | | | | | | | | |
| 02 | MBL | | | | | | | | |
| 03 | DUP | | | | | | | | |
| 04 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 05 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 06 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 07 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 08 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 09 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 12 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 13 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 14 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 15 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 16 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 17 | DO | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 18 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 19 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| 20 | TRG | 08/01/17 07:24 | KSALLINGS | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |



* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ^ Indicates estimated SAF value.
** Actual mass exceeded the calibration curve range. Results should be qualified as appropriate.

Preliminary Data Report & Analytical Calculations

# Work Order: 17-07087-Gamma-2



| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LSC Known | LCS %R | LCS Flag | RPD Flag | Sample Date | Sample Aliquot | Counting Date/Time | Identified |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | CO-60 | LCS | LCS | pCi/g | 1.24E+02 | 7.50E+00 | 1.20E+00 | 1.35E+02 | 91.62 | OK | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 08:48 | YES |
| 01 | CS-137 | LCS | LCS | pCi/g | 8.05E+01 | 9.85E+00 | 1.81E+00 | 8.44E+01 | 95.41 | OK | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 08:48 | YES |
| 02 | AC-228 | MBL | BLANK | pCi/g | 1.19E-03 | 1.26E-01 | 1.80E-01 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | NO |
| 02 | BI-212 | MBL | BLANK | pCi/g | -9.88E-02 | 3.07E-01 | 4.10E-01 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | NO |
| 02 | RA-226 | MBL | BLANK | pCi/g | 9.49E-02 | 6.02E-02 | 8.70E-02 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | YES |
| 02 | CS-137 | MBL | BLANK | pCi/g | 1.20E-02 | 3.81E-02 | 5.90E-02 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | NO |
| 02 | K-40 | MBL | BLANK | pCi/g | 1.13E-01 | 2.40E-01 | 5.31E-01 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | NO |
| 02 | PA-234M | MBL | BLANK | pCi/g | 2.51E+00 | 1.75E+00 | 8.47E-01 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | YES |
| 02 | PB-212 | MBL | BLANK | pCi/g | 3.67E-02 | 3.90E-02 | 6.67E-02 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | NO |
| 02 | RA-224 | MBL | BLANK | pCi/g | 4.85E-01 | 5.63E-01 | 9.39E-01 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | YES |
| 02 | RA-228 | MBL | BLANK | pCi/g | 1.19E-03 | 1.26E-01 | 1.80E-01 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | NO |
| 02 | TH-234 | MBL | BLANK | pCi/g | 7.12E-01 | 4.02E-01 | 6.95E-01 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | NO |
| 02 | TL-208 | MBL | BLANK | pCi/g | -1.21E-02 | 7.89E-02 | 1.16E-01 | | | | | 07/19/17 00:00 | 1.00E+00 | 08/22/17 09:20 | NO |
| 03 | AC-228 | DUP | HTC-A03-S003-1218-01 | pCi/g | 9.08E-01 | 1.73E-01 | 3.61E-01 | | | | OK | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | YES |
| 03 | BI-212 | DUP | HTC-A03-S003-1218-01 | pCi/g | 6.88E-01 | 4.26E-01 | 6.75E-01 | | | | | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | YES |
| 03 | RA-226 | DUP | HTC-A03-S003-1218-01 | pCi/g | 8.63E-01 | 1.30E-01 | 2.11E-01 | | | | OK | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | YES |
| 03 | CS-137 | DUP | HTC-A03-S003-1218-01 | pCi/g | 1.76E-02 | 4.73E-02 | 7.39E-02 | | | | | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | NO |
| 03 | K-40 | DUP | HTC-A03-S003-1218-01 | pCi/g | 1.69E+01 | 1.93E+00 | 1.05E+00 | | | | OK | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | YES |
| 03 | PA-234M | DUP | HTC-A03-S003-1218-01 | pCi/g | -1.08E+00 | 4.73E+00 | 6.77E+00 | | | | | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | NO |
| 03 | PB-212 | DUP | HTC-A03-S003-1218-01 | pCi/g | 8.93E-01 | 1.11E-01 | 1.92E-01 | | | | | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | YES |
| 03 | RA-224 | DUP | HTC-A03-S003-1218-01 | pCi/g | 3.13E+00 | 1.32E+00 | 2.23E+00 | | | | | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | YES |
| 03 | RA-228 | DUP | HTC-A03-S003-1218-01 | pCi/g | 9.08E-01 | 1.73E-01 | 3.61E-01 | | | | | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | YES |
| 03 | TH-234 | DUP | HTC-A03-S003-1218-01 | pCi/g | 1.12E+00 | 9.77E-01 | 1.31E+00 | | | | | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | NO |
| 03 | TL-208 | DUP | HTC-A03-S003-1218-01 | pCi/g | 6.50E-01 | 1.64E-01 | 2.90E-01 | | | | | 05/15/17 08:42 | 6.96E+02 | 08/22/17 09:01 | NO |
| 04 | AC-228 | TRG | HTC-A03-S002-0006-01 | pCi/g | 1.00E+00 | 1.45E-01 | 5.04E-01 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | YES |
| 04 | BI-212 | TRG | HTC-A03-S002-0006-01 | pCi/g | 3.95E-01 | 3.34E-01 | 5.42E-01 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | YES |
| 04 | RA-226 | TRG | HTC-A03-S002-0006-01 | pCi/g | 8.23E-01 | 1.34E-01 | 1.80E-01 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | YES |
| 04 | CS-137 | TRG | HTC-A03-S002-0006-01 | pCi/g | 2.61E-02 | 3.83E-02 | 6.18E-02 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | NO |
| 04 | K-40 | TRG | HTC-A03-S002-0006-01 | pCi/g | 1.65E+01 | 1.86E+00 | 7.91E-01 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | YES |
| 04 | PA-234M | TRG | HTC-A03-S002-0006-01 | pCi/g | 4.48E+00 | 3.96E+00 | 6.99E+00 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | NO |
| 04 | PB-212 | TRG | HTC-A03-S002-0006-01 | pCi/g | 9.09E-01 | 1.13E-01 | 2.41E-01 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | YES |
| 04 | RA-224 | TRG | HTC-A03-S002-0006-01 | pCi/g | 9.59E+00 | 1.32E+00 | 2.13E+00 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | NO |
| 04 | RA-228 | TRG | HTC-A03-S002-0006-01 | pCi/g | 1.00E+00 | 1.45E-01 | 5.04E-01 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | YES |
| 04 | TH-234 | TRG | HTC-A03-S002-0006-01 | pCi/g | 1.17E+00 | 9.94E-01 | 1.65E+00 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | YES |
| 04 | TL-208 | TRG | HTC-A03-S002-0006-01 | pCi/g | 7.99E-01 | 1.38E-01 | 1.62E-01 | | | | | 05/15/17 09:39 | 6.96E+02 | 08/22/17 10:04 | YES |
| 05 | AC-228 | TRG | HTC-A03-S002-0612-01 | pCi/g | 4.56E-01 | 1.37E-01 | 2.21E-01 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | YES |
| 05 | BI-212 | TRG | HTC-A03-S002-0612-01 | pCi/g | 3.52E-01 | 2.16E-01 | 4.71E-01 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | YES |
| 05 | RA-226 | TRG | HTC-A03-S002-0612-01 | pCi/g | 5.34E-01 | 9.34E-02 | 1.31E-01 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | YES |

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# Work Order: 17-07087-Gamma-2

| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LSC Known | LCS %R | LCS Flag | RPD Flag | Sample Date | Sample Aliquot | Counting Date/Time | Identified |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05 | CS-137 | TRG | HTC-A03-S002-0612-01 | pCi/g | 2.24E-02 | 3.11E-02 | 5.16E-02 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | NO |
| 05 | K-40 | TRG | HTC-A03-S002-0612-01 | pCi/g | 8.93E+00 | 1.25E+00 | 8.13E-01 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | YES |
| 05 | PA-234M | TRG | HTC-A03-S002-0612-01 | pCi/g | -6.24E-01 | 3.57E+00 | 5.32E+00 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | NO |
| 05 | PB-212 | TRG | HTC-A03-S002-0612-01 | pCi/g | 5.75E-01 | 1.08E-01 | 1.46E-01 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | YES |
| 05 | RA-224 | TRG | HTC-A03-S002-0612-01 | pCi/g | 3.53E+00 | 1.14E+00 | 1.52E+00 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | NO |
| 05 | RA-228 | TRG | HTC-A03-S002-0612-01 | pCi/g | 4.56E-01 | 1.37E-01 | 2.21E-01 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | YES |
| 05 | TH-234 | TRG | HTC-A03-S002-0612-01 | pCi/g | 1.10E+00 | 5.30E-01 | 8.75E-01 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | NO |
| 05 | TL-208 | TRG | HTC-A03-S002-0612-01 | pCi/g | 4.21E-01 | 8.66E-02 | 8.17E-02 | | | | | 05/15/17 09:36 | 8.27E+02 | 08/22/17 09:01 | YES |
| 06 | AC-228 | TRG | HTC-A03-S002-1218-01 | pCi/g | 7.86E-01 | 1.93E-01 | 3.43E-01 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | YES |
| 06 | BI-212 | TRG | HTC-A03-S002-1218-01 | pCi/g | 6.09E-01 | 5.96E-01 | 9.87E-01 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | YES |
| 06 | RA-226 | TRG | HTC-A03-S002-1218-01 | pCi/g | 1.12E+00 | 1.42E-01 | 1.99E-01 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | YES |
| 06 | CS-137 | TRG | HTC-A03-S002-1218-01 | pCi/g | 4.96E-02 | 4.94E-02 | 8.31E-02 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | NO |
| 06 | K-40 | TRG | HTC-A03-S002-1218-01 | pCi/g | 1.56E+01 | 1.91E+00 | 9.62E-01 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | YES |
| 06 | PA-234M | TRG | HTC-A03-S002-1218-01 | pCi/g | 2.26E+00 | 5.28E+00 | 8.51E+00 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | NO |
| 06 | PB-212 | TRG | HTC-A03-S002-1218-01 | pCi/g | 8.59E-01 | 1.20E-01 | 2.13E-01 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | YES |
| 06 | RA-224 | TRG | HTC-A03-S002-1218-01 | pCi/g | 1.30E+01 | 1.64E+00 | 2.47E+00 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | NO |
| 06 | RA-228 | TRG | HTC-A03-S002-1218-01 | pCi/g | 7.86E-01 | 1.93E-01 | 3.43E-01 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | YES |
| 06 | TH-234 | TRG | HTC-A03-S002-1218-01 | pCi/g | 1.48E+00 | 1.04E+00 | 1.41E+00 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | NO |
| 06 | TL-208 | TRG | HTC-A03-S002-1218-01 | pCi/g | 8.81E-01 | 1.66E-01 | 2.09E-01 | | | | | 05/15/17 09:33 | 7.73E+02 | 08/22/17 09:01 | YES |
| 07 | AC-228 | TRG | HTC-A03-S002-1824-01 | pCi/g | 1.08E+00 | 1.85E-01 | 3.63E-01 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 07 | BI-212 | TRG | HTC-A03-S002-1824-01 | pCi/g | 8.02E-01 | 4.19E-01 | 6.82E-01 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 07 | RA-226 | TRG | HTC-A03-S002-1824-01 | pCi/g | 9.37E-01 | 1.35E-01 | 2.76E-01 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 07 | CS-137 | TRG | HTC-A03-S002-1824-01 | pCi/g | 6.68E-02 | 4.40E-02 | 6.87E-02 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 07 | K-40 | TRG | HTC-A03-S002-1824-01 | pCi/g | 1.93E+01 | 2.30E+00 | 9.22E-01 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 07 | PA-234M | TRG | HTC-A03-S002-1824-01 | pCi/g | 2.45E+00 | 5.12E+00 | 8.41E+00 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | NO |
| 07 | PB-212 | TRG | HTC-A03-S002-1824-01 | pCi/g | 1.13E+00 | 1.31E-01 | 2.18E-01 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 07 | RA-224 | TRG | HTC-A03-S002-1824-01 | pCi/g | 2.63E+00 | 1.40E+00 | 2.50E+00 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 07 | RA-228 | TRG | HTC-A03-S002-1824-01 | pCi/g | 1.08E+00 | 1.85E-01 | 3.63E-01 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 07 | TH-234 | TRG | HTC-A03-S002-1824-01 | pCi/g | 1.33E+00 | 7.50E-01 | 1.22E+00 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | NO |
| 07 | TL-208 | TRG | HTC-A03-S002-1824-01 | pCi/g | 9.44E-01 | 1.66E-01 | 2.57E-01 | | | | | 05/15/17 09:27 | 6.44E+02 | 08/22/17 10:04 | YES |
| 08 | AC-228 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.10E+00 | 2.42E-01 | 5.86E-01 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | YES |
| 08 | BI-212 | TRG | HTC-A03-S002-2430-01 | pCi/g | 8.11E-01 | 5.24E-01 | 8.26E-01 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | YES |
| 08 | RA-226 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.22E+00 | 1.88E-01 | 2.27E-01 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | YES |
| 08 | CS-137 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.08E-01 | 7.60E-02 | 1.27E-01 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | NO |
| 08 | K-40 | TRG | HTC-A03-S002-2430-01 | pCi/g | 2.10E+01 | 2.57E+00 | 1.52E+00 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | YES |
| 08 | PA-234M | TRG | HTC-A03-S002-2430-01 | pCi/g | 3.13E+00 | 6.59E+00 | 1.07E+01 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | NO |
| 08 | PB-212 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.16E+00 | 1.55E-01 | 2.61E-01 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | YES |
| 08 | RA-224 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.62E+01 | 2.09E+00 | 3.12E+00 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | NO |

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# Work Order: 17-07087-Gamma-2



| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LSC Known | LCS %R | LCS Flag | RPD Flag | Sample Date | Sample Aliquot | Counting Date/Time | Identified |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08 | RA-228 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.10E+00 | 2.42E-01 | 5.86E-01 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | YES |
| 08 | TH-234 | TRG | HTC-A03-S002-2430-01 | pCi/g | 1.77E+00 | 1.50E+00 | 2.50E+00 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | YES |
| 08 | TL-208 | TRG | HTC-A03-S002-2430-01 | pCi/g | 9.73E-01 | 1.97E-01 | 2.76E-01 | | | | | 05/15/17 09:24 | 6.26E+02 | 08/22/17 10:04 | YES |
| 09 | AC-228 | TRG | HTC-A03-S002-3036-01 | pCi/g | 1.01E+00 | 2.59E-01 | 4.98E-01 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | YES |
| 09 | BI-212 | TRG | HTC-A03-S002-3036-01 | pCi/g | 3.00E-01 | 6.88E-01 | 1.01E+00 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | NO |
| 09 | RA-226 | TRG | HTC-A03-S002-3036-01 | pCi/g | 8.42E-01 | 1.82E-01 | 2.58E-01 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | YES |
| 09 | CS-137 | TRG | HTC-A03-S002-3036-01 | pCi/g | 2.01E-01 | 1.06E-01 | 1.63E-01 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | YES |
| 09 | K-40 | TRG | HTC-A03-S002-3036-01 | pCi/g | 1.59E+01 | 2.24E+00 | 1.28E+00 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | YES |
| 09 | PA-234M | TRG | HTC-A03-S002-3036-01 | pCi/g | -7.23E+00 | 9.40E+00 | 1.16E+01 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | NO |
| 09 | PB-212 | TRG | HTC-A03-S002-3036-01 | pCi/g | 1.19E+00 | 2.01E-01 | 2.58E-01 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | YES |
| 09 | RA-224 | TRG | HTC-A03-S002-3036-01 | pCi/g | 1.18E+01 | 1.82E+00 | 2.87E+00 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | NO |
| 09 | RA-228 | TRG | HTC-A03-S002-3036-01 | pCi/g | 1.01E+00 | 2.59E-01 | 4.98E-01 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | YES |
| 09 | TH-234 | TRG | HTC-A03-S002-3036-01 | pCi/g | 1.13E+00 | 1.22E+00 | 1.82E+00 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | NO |
| 09 | TL-208 | TRG | HTC-A03-S002-3036-01 | pCi/g | 9.28E-01 | 3.34E-01 | 4.86E-01 | | | | | 05/15/17 09:21 | 6.95E+02 | 08/22/17 10:21 | YES |
| 12 | AC-228 | TRG | HTC-A03-S002-3036-02 | pCi/g | 1.15E+00 | 1.93E-01 | 4.22E-01 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | BI-212 | TRG | HTC-A03-S002-3036-02 | pCi/g | 5.54E-01 | 4.18E-01 | 6.76E-01 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | RA-226 | TRG | HTC-A03-S002-3036-02 | pCi/g | 9.60E-01 | 1.42E-01 | 2.02E-01 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | CS-137 | TRG | HTC-A03-S002-3036-02 | pCi/g | 1.38E-01 | 6.23E-02 | 9.44E-02 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | K-40 | TRG | HTC-A03-S002-3036-02 | pCi/g | 2.03E+01 | 2.18E+00 | 9.37E-01 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | PA-234M | TRG | HTC-A03-S002-3036-02 | pCi/g | -1.77E+00 | 4.79E+00 | 6.56E+00 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | NO |
| 12 | PB-212 | TRG | HTC-A03-S002-3036-02 | pCi/g | 1.21E+00 | 1.39E-01 | 2.51E-01 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | RA-224 | TRG | HTC-A03-S002-3036-02 | pCi/g | 3.15E+00 | 1.25E+00 | 2.85E+00 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | RA-228 | TRG | HTC-A03-S002-3036-02 | pCi/g | 1.15E+00 | 1.93E-01 | 4.22E-01 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | TH-234 | TRG | HTC-A03-S002-3036-02 | pCi/g | 2.04E+00 | 1.44E+00 | 2.37E+00 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 12 | TL-208 | TRG | HTC-A03-S002-3036-02 | pCi/g | 9.66E-01 | 1.54E-01 | 1.37E-01 | | | | | 05/15/17 09:21 | 6.83E+02 | 08/22/17 11:06 | YES |
| 13 | AC-228 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.06E+00 | 2.05E-01 | 4.07E-01 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | YES |
| 13 | BI-212 | TRG | HTC-A03-S002-3642-01 | pCi/g | 4.19E-01 | 4.70E-01 | 7.83E-01 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | YES |
| 13 | RA-226 | TRG | HTC-A03-S002-3642-01 | pCi/g | 9.04E-01 | 1.39E-01 | 1.81E-01 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | YES |
| 13 | CS-137 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.22E-02 | 5.07E-02 | 7.80E-02 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | NO |
| 13 | K-40 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.86E+01 | 2.25E+00 | 1.08E+00 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | YES |
| 13 | PA-234M | TRG | HTC-A03-S002-3642-01 | pCi/g | 3.72E+00 | 4.77E+00 | 8.13E+00 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | NO |
| 13 | PB-212 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.04E+00 | 1.23E-01 | 2.28E-01 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | YES |
| 13 | RA-224 | TRG | HTC-A03-S002-3642-01 | pCi/g | 7.57E+00 | 1.82E+00 | 2.40E+00 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | NO |
| 13 | RA-228 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.06E+00 | 2.05E-01 | 4.07E-01 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | YES |
| 13 | TH-234 | TRG | HTC-A03-S002-3642-01 | pCi/g | 1.10E+00 | 1.16E+00 | 1.94E+00 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | YES |
| 13 | TL-208 | TRG | HTC-A03-S002-3642-01 | pCi/g | 9.56E-01 | 1.54E-01 | 1.05E-01 | | | | | 05/15/17 09:18 | 6.44E+02 | 08/22/17 11:06 | YES |
| 14 | AC-228 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.02E+00 | 2.10E-01 | 5.63E-01 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |
| 14 | BI-212 | TRG | HTC-A03-S002-4248-01 | pCi/g | 5.88E-01 | 5.61E-01 | 9.25E-01 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |

0325

# Work Order: 17-07087-Gamma-2

| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LSC Known | LCS %R | LCS Flag | RPD Flag | Sample Date | Sample Aliquot | Counting Date/Time | Identified |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | RA-226 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.07E+00 | 1.83E-01 | 2.71E-01 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |
| 14 | CS-137 | TRG | HTC-A03-S002-4248-01 | pCi/g | 5.99E-02 | 6.01E-02 | 1.32E-01 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |
| 14 | K-40 | TRG | HTC-A03-S002-4248-01 | pCi/g | 2.13E+01 | 2.42E+00 | 4.45E-01 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |
| 14 | PA-234M | TRG | HTC-A03-S002-4248-01 | pCi/g | -6.82E-01 | 6.69E+00 | 9.94E+00 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | NO |
| 14 | PB-212 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.20E+00 | 1.47E-01 | 2.27E-01 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |
| 14 | RA-224 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.58E+01 | 1.95E+00 | 2.88E+00 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | NO |
| 14 | RA-228 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.02E+00 | 2.10E-01 | 5.63E-01 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |
| 14 | TH-234 | TRG | HTC-A03-S002-4248-01 | pCi/g | 1.99E+00 | 1.61E+00 | 2.68E+00 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |
| 14 | TL-208 | TRG | HTC-A03-S002-4248-01 | pCi/g | 9.04E-01 | 1.74E-01 | 1.77E-01 | | | | | 05/15/17 09:15 | 6.74E+02 | 08/22/17 11:06 | YES |
| 15 | AC-228 | TRG | HTC-A03-S003-0006-01 | pCi/g | 1.02E+00 | 3.02E-01 | 6.21E-01 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 15 | BI-212 | TRG | HTC-A03-S003-0006-01 | pCi/g | -1.19E-01 | 2.45E-01 | 1.11E+00 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | NO |
| 15 | RA-226 | TRG | HTC-A03-S003-0006-01 | pCi/g | 9.62E-01 | 2.50E-01 | 3.52E-01 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 15 | CS-137 | TRG | HTC-A03-S003-0006-01 | pCi/g | 1.84E-01 | 1.24E-01 | 1.97E-01 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 15 | K-40 | TRG | HTC-A03-S003-0006-01 | pCi/g | 2.06E+01 | 2.75E+00 | 1.24E+00 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 15 | PA-234M | TRG | HTC-A03-S003-0006-01 | pCi/g | 2.04E-01 | 1.02E+01 | 1.45E+01 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | NO |
| 15 | PB-212 | TRG | HTC-A03-S003-0006-01 | pCi/g | 1.05E+00 | 1.62E-01 | 3.20E-01 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 15 | RA-224 | TRG | HTC-A03-S003-0006-01 | pCi/g | 3.07E+00 | 1.63E+00 | 3.64E+00 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 15 | RA-228 | TRG | HTC-A03-S003-0006-01 | pCi/g | 1.02E+00 | 3.02E-01 | 6.21E-01 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 15 | TH-234 | TRG | HTC-A03-S003-0006-01 | pCi/g | 1.34E+00 | 1.48E+00 | 2.47E+00 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 15 | TL-208 | TRG | HTC-A03-S003-0006-01 | pCi/g | 1.12E+00 | 2.81E-01 | 5.93E-01 | | | | | 05/15/17 08:48 | 6.02E+02 | 08/22/17 11:21 | YES |
| 16 | AC-228 | TRG | HTC-A03-S003-0612-01 | pCi/g | 1.04E+00 | 1.76E-01 | 3.77E-01 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | BI-212 | TRG | HTC-A03-S003-0612-01 | pCi/g | 9.50E-01 | 4.75E-01 | 7.33E-01 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | RA-226 | TRG | HTC-A03-S003-0612-01 | pCi/g | 1.01E+00 | 1.52E-01 | 2.02E-01 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | CS-137 | TRG | HTC-A03-S003-0612-01 | pCi/g | 1.47E-01 | 7.38E-02 | 1.16E-01 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | K-40 | TRG | HTC-A03-S003-0612-01 | pCi/g | 1.79E+01 | 1.98E+00 | 1.36E+00 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | PA-234M | TRG | HTC-A03-S003-0612-01 | pCi/g | 4.77E-01 | 4.36E+00 | 6.83E+00 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | NO |
| 16 | PB-212 | TRG | HTC-A03-S003-0612-01 | pCi/g | 1.17E+00 | 1.34E-01 | 2.00E-01 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | RA-224 | TRG | HTC-A03-S003-0612-01 | pCi/g | 2.97E+00 | 1.14E+00 | 2.24E+00 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | RA-228 | TRG | HTC-A03-S003-0612-01 | pCi/g | 1.04E+00 | 1.76E-01 | 3.77E-01 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | TH-234 | TRG | HTC-A03-S003-0612-01 | pCi/g | 9.99E-01 | 9.94E-01 | 1.66E+00 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 16 | TL-208 | TRG | HTC-A03-S003-0612-01 | pCi/g | 9.15E-01 | 1.56E-01 | 1.39E-01 | | | | | 05/15/17 08:45 | 6.74E+02 | 08/22/17 12:08 | YES |
| 17 | AC-228 | DO | HTC-A03-S003-1218-01 | pCi/g | 1.07E+00 | 2.12E-01 | 3.61E-01 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 17 | BI-212 | DO | HTC-A03-S003-1218-01 | pCi/g | 7.89E-01 | 4.80E-01 | 8.84E-01 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 17 | RA-226 | DO | HTC-A03-S003-1218-01 | pCi/g | 9.51E-01 | 1.29E-01 | 1.57E-01 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 17 | CS-137 | DO | HTC-A03-S003-1218-01 | pCi/g | -1.83E-02 | 5.07E-02 | 7.23E-02 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | NO |
| 17 | K-40 | DO | HTC-A03-S003-1218-01 | pCi/g | 2.16E+01 | 2.45E+00 | 6.25E-01 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 17 | PA-234M | DO | HTC-A03-S003-1218-01 | pCi/g | 5.99E+00 | 4.65E+00 | 7.41E+00 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 17 | PB-212 | DO | HTC-A03-S003-1218-01 | pCi/g | 1.04E+00 | 1.24E-01 | 2.09E-01 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |

# Work Order: 17-07087-Gamma-2



| Lab Fraction | Nuclide | Sample Desc | Client Identification | Activity Units | Results | Error Estimate | MDA | LSC Known | LCS %R | LCS Flag | RPD Flag | Sample Date | Sample Aliquot | Counting Date/Time | Identified |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | RA-224 | DO | HTC-A03-S003-1218-01 | pCi/g | 2.25E+00 | 8.45E-01 | 2.35E+00 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 17 | RA-228 | DO | HTC-A03-S003-1218-01 | pCi/g | 1.07E+00 | 2.12E-01 | 3.61E-01 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 17 | TH-234 | DO | HTC-A03-S003-1218-01 | pCi/g | 1.06E+00 | 1.28E+00 | 2.15E+00 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 17 | TL-208 | DO | HTC-A03-S003-1218-01 | pCi/g | 1.02E+00 | 1.53E-01 | 9.90E-02 | | | | | 05/15/17 08:42 | 6.83E+02 | 08/22/17 12:08 | YES |
| 18 | AC-228 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.05E+00 | 2.10E-01 | 3.45E-01 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | YES |
| 18 | BI-212 | TRG | HTC-A03-S003-1824-01 | pCi/g | 6.09E-01 | 5.01E-01 | 8.15E-01 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | YES |
| 18 | RA-226 | TRG | HTC-A03-S003-1824-01 | pCi/g | 9.23E-01 | 1.84E-01 | 2.43E-01 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | YES |
| 18 | CS-137 | TRG | HTC-A03-S003-1824-01 | pCi/g | -2.04E-02 | 6.63E-02 | 9.57E-02 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | NO |
| 18 | K-40 | TRG | HTC-A03-S003-1824-01 | pCi/g | 2.14E+01 | 2.46E+00 | 1.12E+00 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | YES |
| 18 | PA-234M | TRG | HTC-A03-S003-1824-01 | pCi/g | 6.97E+00 | 6.10E+00 | 1.06E+01 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | NO |
| 18 | PB-212 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.15E+00 | 1.47E-01 | 2.38E-01 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | YES |
| 18 | RA-224 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.62E+01 | 1.93E+00 | 2.83E+00 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | NO |
| 18 | RA-228 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.05E+00 | 2.10E-01 | 3.45E-01 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | YES |
| 18 | TH-234 | TRG | HTC-A03-S003-1824-01 | pCi/g | 1.33E+00 | 1.19E+00 | 1.99E+00 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | YES |
| 18 | TL-208 | TRG | HTC-A03-S003-1824-01 | pCi/g | 9.96E-01 | 1.75E-01 | 1.79E-01 | | | | | 05/15/17 08:39 | 7.08E+02 | 08/22/17 12:08 | YES |
| 19 | AC-228 | TRG | HTC-A03-S003-2430-01 | pCi/g | 1.14E+00 | 2.96E-01 | 4.66E-01 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | YES |
| 19 | BI-212 | TRG | HTC-A03-S003-2430-01 | pCi/g | 1.58E+00 | 1.02E+00 | 1.63E+00 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | YES |
| 19 | RA-226 | TRG | HTC-A03-S003-2430-01 | pCi/g | 1.25E+00 | 2.55E-01 | 4.51E-01 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | YES |
| 19 | CS-137 | TRG | HTC-A03-S003-2430-01 | pCi/g | 1.23E-01 | 8.35E-02 | 1.39E-01 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | NO |
| 19 | K-40 | TRG | HTC-A03-S003-2430-01 | pCi/g | 2.43E+01 | 3.11E+00 | 1.46E+00 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | YES |
| 19 | PA-234M | TRG | HTC-A03-S003-2430-01 | pCi/g | -7.73E-01 | 1.19E+01 | 1.64E+01 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | NO |
| 19 | PB-212 | TRG | HTC-A03-S003-2430-01 | pCi/g | 1.73E+00 | 2.40E-01 | 2.64E-01 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | YES |
| 19 | RA-224 | TRG | HTC-A03-S003-2430-01 | pCi/g | 1.83E+01 | 2.39E+00 | 3.61E+00 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | NO |
| 19 | RA-228 | TRG | HTC-A03-S003-2430-01 | pCi/g | 1.14E+00 | 2.96E-01 | 4.66E-01 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | YES |
| 19 | TH-234 | TRG | HTC-A03-S003-2430-01 | pCi/g | -4.40E-01 | 1.50E+00 | 2.14E+00 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | NO |
| 19 | TL-208 | TRG | HTC-A03-S003-2430-01 | pCi/g | 1.33E+00 | 4.00E-01 | 5.64E-01 | | | | | 05/15/17 08:36 | 6.06E+02 | 08/22/17 12:23 | YES |
| 20 | AC-228 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.16E+00 | 1.63E-01 | 2.94E-01 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | YES |
| 20 | BI-212 | TRG | HTC-A03-S003-3036-01 | pCi/g | 9.03E-01 | 5.43E-01 | 8.66E-01 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | YES |
| 20 | RA-226 | TRG | HTC-A03-S003-3036-01 | pCi/g | 9.02E-01 | 1.24E-01 | 2.14E-01 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | YES |
| 20 | CS-137 | TRG | HTC-A03-S003-3036-01 | pCi/g | -6.10E-03 | 4.44E-02 | 6.62E-02 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | NO |
| 20 | K-40 | TRG | HTC-A03-S003-3036-01 | pCi/g | 2.38E+01 | 2.47E+00 | 6.32E-01 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | YES |
| 20 | PA-234M | TRG | HTC-A03-S003-3036-01 | pCi/g | -1.76E+00 | 5.27E+00 | 7.67E+00 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | NO |
| 20 | PB-212 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.23E+00 | 1.37E-01 | 2.20E-01 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | YES |
| 20 | RA-224 | TRG | HTC-A03-S003-3036-01 | pCi/g | 3.59E+00 | 1.17E+00 | 2.47E+00 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | YES |
| 20 | RA-228 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.16E+00 | 1.63E-01 | 2.94E-01 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | YES |
| 20 | TH-234 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.49E+00 | 1.11E+00 | 1.49E+00 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | NO |
| 20 | TL-208 | TRG | HTC-A03-S003-3036-01 | pCi/g | 1.08E+00 | 1.58E-01 | 1.00E-01 | | | | | 05/15/17 08:33 | 6.84E+02 | 08/22/17 13:11 | YES |

**Count Room Report**
**Client: Weston Solutions, Inc.**

**17-07087-Gamma-2 (pCi/g) in SO**
**Tracer ID:**

In Gallon



| Internal Fraction | Sample Desc | Client ID | Sample Date | Sample Aliquot | Tracer Aliquot (g) | Tracer ACT (dpm) | Radiometric Tracer (pCi) | Radiometric % Rec | SAF 1* | SAF 2* |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | LCS | LCS | 07/19/17 00:00 | 1.0000 | | | | 0.00 | | |
| 02 | MBL | BLANK | 07/19/17 00:00 | 1.0000 | | | | 0.00 | | |
| 03 | DUP | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 695.7700 | | | | 0.00 | | |
| 04 | TRG | HTC-A03-S002-0006-01 | 05/15/17 09:39 | 695.7700 | | | | 0.00 | | |
| 05 | TRG | HTC-A03-S002-0612-01 | 05/15/17 09:36 | 826.8000 | | | | 0.00 | | |
| 06 | TRG | HTC-A03-S002-1218-01 | 05/15/17 09:33 | 773.2500 | | | | 0.00 | | |
| 07 | TRG | HTC-A03-S002-1824-01 | 05/15/17 09:27 | 643.9200 | | | | 0.00 | | |
| 08 | TRG | HTC-A03-S002-2430-01 | 05/15/17 09:24 | 625.5400 | | | | 0.00 | | |
| 09 | TRG | HTC-A03-S002-3036-01 | 05/15/17 09:21 | 694.7900 | | | | 0.00 | | |
| 12 | TRG | HTC-A03-S002-3036-02 | 05/15/17 09:21 | 682.5600 | | | | 0.00 | | |
| 13 | TRG | HTC-A03-S002-3642-01 | 05/15/17 09:18 | 644.2600 | | | | 0.00 | | |
| 14 | TRG | HTC-A03-S002-4248-01 | 05/15/17 09:15 | 673.7900 | | | | 0.00 | | |
| 15 | TRG | HTC-A03-S003-0006-01 | 05/15/17 08:48 | 601.7000 | | | | 0.00 | | |
| 16 | TRG | HTC-A03-S003-0612-01 | 05/15/17 08:45 | 673.6800 | | | | 0.00 | | |
| 17 | DO | HTC-A03-S003-1218-01 | 05/15/17 08:42 | 682.8900 | | | | 0.00 | | |
| 18 | TRG | HTC-A03-S003-1824-01 | 05/15/17 08:39 | 707.9000 | | | | 0.00 | | |
| 19 | TRG | HTC-A03-S003-2430-01 | 05/15/17 08:36 | 605.8900 | | | | 0.00 | | |
| 20 | TRG | HTC-A03-S003-3036-01 | 05/15/17 08:33 | 683.8900 | | | | 0.00 | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Eberline Analytical
Oak Ridge Laboratory

# Aliquot Worksheet



| Work Order | Run | Analysis Code | Rpt Units | Lab Deadline | Technician |
|---|---|---|---|---|---|
| 17-07087 | 2 | Gamma | grams | 8/10/2017 | KSALLINGS |

| Lab Fraction | Weston Solutions, Inc. Client ID | Sample Type | Muffle Data | Dilution Data | | | Aliquot Data | | MS Aliquot Data | | H-3 Solids Only | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ratio Post/Pre | No of Dils | Dil Factor | Ratio | Aliquot | Net Equiv | Aliquot | Net Equiv | Water Added (ml) | H3 Dist Aliq |
| 01 | LCS | LCS | | | | | 1.0000E+00 | 1.0000E+00 | | | | |
| 02 | BLANK | MBL | | | | | 1.0000E+00 | 1.0000E+00 | | | | |
| 03 | HTC-A03-S003-1218-01 | DUP | | | | | 6.9577E+02 | 6.9577E+02 | | | | |
| 04 | HTC-A03-S002-0006-01 | TRG | | | | | 6.9577E+02 | 6.9577E+02 | | | | |
| 05 | HTC-A03-S002-0612-01 | TRG | | | | | 8.2680E+02 | 8.2680E+02 | | | | |
| 06 | HTC-A03-S002-1218-01 | TRG | | | | | 7.7325E+02 | 7.7325E+02 | | | | |
| 07 | HTC-A03-S002-1824-01 | TRG | | | | | 6.4392E+02 | 6.4392E+02 | | | | |
| 08 | HTC-A03-S002-2430-01 | TRG | | | | | 6.2554E+02 | 6.2554E+02 | | | | |
| 09 | HTC-A03-S002-3036-01 | TRG | | | | | 6.9479E+02 | 6.9479E+02 | | | | |
| 12 | HTC-A03-S002-3036-02 | TRG | | | | | 6.8256E+02 | 6.8256E+02 | | | | |
| 13 | HTC-A03-S002-3642-01 | TRG | | | | | 6.4426E+02 | 6.4426E+02 | | | | |
| 14 | HTC-A03-S002-4248-01 | TRG | | | | | 6.7379E+02 | 6.7379E+02 | | | | |
| 15 | HTC-A03-S003-0006-01 | TRG | | | | | 6.0170E+02 | 6.0170E+02 | | | | |
| 16 | HTC-A03-S003-0612-01 | TRG | | | | | 6.7368E+02 | 6.7368E+02 | | | | |
| 17 | HTC-A03-S003-1218-01 | DO | | | | | 6.8289E+02 | 6.8289E+02 | | | | |
| 18 | HTC-A03-S003-1824-01 | TRG | | | | | 7.0790E+02 | 7.0790E+02 | | | | |
| 19 | HTC-A03-S003-2430-01 | TRG | | | | | 6.0589E+02 | 6.0589E+02 | | | | |
| 20 | HTC-A03-S003-3036-01 | TRG | | | | | 6.8389E+02 | 6.8389E+02 | | | | |

| Comments | |
|---|---|

0329

Technician: Kerry Sallings Date: 8/1/17

Eberline Services - Oak Ridge
Prep Logbook
Version 2.0 8/1999

# Rough Sample Preparation Log Book



| Work Order | Lab Deadline | Date Received in Prep | Date Sealed | Date Returned | Technician |
|---|---|---|---|---|---|
| 17-07087 | 8/10/2017 | 7/31/2017 | 8/1/2017 | 8/2/2017 | KSALLINGS |

**Bico Pulverizer:** 000302 [✓] Jaw Crusher 68275 [ ]

| Eberline Fraction | Weston Solutions, Inc. Client ID | Tare (g) Pan Wt | Gross (g) Wet Wt. | Gross (g) Dry Wt. | Net (g) Wet Wt. | Net (g) Dry Wt. | Percent Liquid | Percent Solid | Gamma Dry Wt. | Gamma LEPS Wt. | Special Info |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 04 | HTC-A03-S002-0006-01 | 14.6400 | 1033.2200 | 900.0000 | 1018.5800 | 885.3600 | 13.08% | 86.92% | 0.0000 | 0.0000 | |
| 05 | HTC-A03-S002-0612-01 | 14.6200 | 985.7200 | 901.2600 | 971.1000 | 886.6400 | 8.70% | 91.30% | 0.0000 | 0.0000 | |
| 06 | HTC-A03-S002-1218-01 | 14.5900 | 1011.0600 | 869.2800 | 996.4700 | 854.6900 | 14.23% | 85.77% | 0.0000 | 0.0000 | |
| 07 | HTC-A03-S002-1824-01 | 14.6400 | 959.0000 | 786.5200 | 944.3600 | 771.8800 | 18.26% | 81.74% | 0.0000 | 0.0000 | |
| 08 | HTC-A03-S002-2430-01 | 14.6700 | 975.4000 | 778.3000 | 960.7300 | 763.6300 | 20.52% | 79.48% | 0.0000 | 0.0000 | |
| 09 | HTC-A03-S002-3036-01 | 14.6500 | 1039.9200 | 835.9600 | 1025.2700 | 821.3100 | 19.89% | 80.11% | 0.0000 | 0.0000 | |
| 10 | HTC-A03-S002-3036-01 MS | 14.6300 | 1041.0600 | 837.2200 | 1026.4300 | 822.5900 | 19.86% | 80.14% | 0.0000 | 0.0000 | |
| 11 | HTC-A03-S002-3036-01 MSD | 14.6300 | 1041.0600 | 837.2200 | 1026.4300 | 822.5900 | 19.86% | 80.14% | 0.0000 | 0.0000 | |
| 12 | HTC-A03-S002-3036-02 | 14.6100 | 1055.0000 | 849.4000 | 1040.3900 | 834.7900 | 19.76% | 80.24% | 0.0000 | 0.0000 | |
| 13 | HTC-A03-S002-3642-01 | 14.6200 | 1050.1600 | 852.9800 | 1035.5400 | 838.3600 | 19.04% | 80.96% | 0.0000 | 0.0000 | |
| 14 | HTC-A03-S002-4248-01 | 14.6000 | 1044.5000 | 851.5800 | 1029.9000 | 836.9800 | 18.73% | 81.27% | 0.0000 | 0.0000 | |
| 15 | HTC-A03-S003-0006-01 | 14.5200 | 948.8000 | 716.8200 | 934.2800 | 702.3000 | 24.83% | 75.17% | 0.0000 | 0.0000 | |
| 16 | HTC-A03-S003-0612-01 | 14.5100 | 997.5000 | 781.2900 | 982.9900 | 766.7800 | 22.00% | 78.00% | 0.0000 | 0.0000 | |
| 17 | HTC-A03-S003-1218-01 | 14.4900 | 1025.8600 | 819.9600 | 1011.3700 | 805.4700 | 20.36% | 79.64% | 0.0000 | 0.0000 | |
| 18 | HTC-A03-S003-1824-01 | 14.5300 | 1023.6600 | 832.7600 | 1009.1300 | 818.2300 | 18.92% | 81.08% | 0.0000 | 0.0000 | |
| 19 | HTC-A03-S003-2430-01 | 14.6300 | 916.4000 | 754.6300 | 901.7700 | 740.0000 | 17.94% | 82.06% | 0.0000 | 0.0000 | |
| 20 | HTC-A03-S003-3036-01 | 14.5400 | 925.6400 | 765.7600 | 911.1000 | 751.2200 | 17.55% | 82.45% | 0.0000 | 0.0000 | |

**OVENS** Fisher Isotemp SN 00579 [✓] VWR SN 000588 [ ]

| | |
|---|---|
| *Comments* | |
| *Special Codes* | **H: Hot, O: Organic Hazard, P: PCB Hazard, R: Rush, T: Other (see comments)** |

0330

Technician: [signature] Date: **Analysis: Rough Prep Logbook** **Analysis: Gamma Page No. 10174**

Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404·352·8677
Fax 404·352·2837
www.analyticsinc.com

# CERTIFICATE OF CALIBRATION

## Standard Radionuclide Source

GAS-1402

## 98503

### Sand in 16 Ounce PP Taral Jar Filled to Capacity

**Customer:** Eberline Analytical Corporation
**P.O. No.:** OR-1405030, Item 6 Product Code: 8401-EG-SAN
**Reference Date:** 01-Oct-2014 12:00 PM EST **Grams of Master Source:** 0.017608

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. 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. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

| Nuclide | Gamma-Ray Energy (keV) | Half-Life, Days | Master Source* γps/gram | This Source γps | Uncertainty*, % Type $u_A$ | $u_B$ | U | Calibration Method* |
|---|---|---|---|---|---|---|---|---|
| Am-241 | 59.5 | 1.580E+05 | ——— | 2.030E+03 | 0.1 | 1.8 | 3.6 | 4π LS |
| Cd-109 | 88.0 | 4.614E+02 | 1.663E+05 | 2.929E+03 | 0.5 | 2.0 | 4.1 | HPGe |
| Co-57 | 122.1 | 2.717E+02 | 8.913E+04 | 1.569E+03 | 0.4 | 1.7 | 3.5 | HPGe |
| Ce-139 | 165.9 | 1.376E+02 | 1.241E+05 | 2.185E+03 | 0.4 | 1.7 | 3.5 | HPGe |
| Hg-203 | 279.2 | 4.659E+01 | 2.675E+05 | 4.710E+03 | 0.3 | 1.7 | 3.5 | HPGe |
| Sn-113 | 391.7 | 1.151E+02 | 1.796E+05 | 3.163E+03 | 0.4 | 1.9 | 3.9 | HPGe |
| Cs-137 | 661.7 | 1.099E+04 | 1.111E+05 | 1.956E+03 | 0.7 | 1.9 | 4.0 | HPGe |
| Y-88 | 898.0 | 1.066E+02 | 4.223E+05 | 7.435E+03 | 0.7 | 1.7 | 3.7 | HPGe |
| Co-60 | 1173.2 | 1.925E+03 | 2.091E+05 | 3.683E+03 | 0.7 | 1.8 | 3.9 | HPGe |
| Co-60 | 1332.5 | 1.925E+03 | 2.094E+05 | 3.687E+03 | 0.7 | 1.8 | 3.9 | HPGe |
| Y-88 | 1836.1 | 1.066E+02 | 4.471E+05 | 7.872E+03 | 0.7 | 1.7 | 3.7 | HPGe |

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

**Calibration Methods:** 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ANA Form005 Rev. —

ACCREDITED SOURCE CALIBRATION LABORATORY HEALTH PHYSICS SOCIETY FOUNDED 1954



**Corporate Office**
24937 Avenue Tibbitts Valencia, California 91355

**Laboratory**
1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Apex-Gamma

Analysis Report for 1707087-01
GAS-1402

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-01 |
| Sample Description | : GAS-1402 |
| Sample Type | : SOIL |
| Sample Size | : 7.360E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 10/1/2014 5:40:00AM |
| Acquisition Started | : 8/22/2017 8:48:15AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE4 |
| Geometry | : GAS-1602 |
| Live Time | : 1800.0 seconds |
| Real Time | : 1833.8 seconds |
| Dead Time | : 1.85 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 14 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55702 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-01

GAS-1402

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 9:18:52AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 22.43 | 21.48 | 0.0000 | 0.00 |
| 2 | 31.99 | 31.04 | 0.0000 | 0.00 |
| 3 | 50.61 | 49.66 | 0.0000 | 0.00 |
| 4 | 55.57 | 54.62 | 0.0000 | 0.00 |
| 5 | 59.40 | 58.45 | 0.0000 | 0.00 |
| 6 | 68.12 | 67.17 | 0.0000 | 0.00 |
| 7 | 84.21 | 83.27 | 0.0000 | 0.00 |
| 8 | 87.98 | 87.04 | 0.0000 | 0.00 |
| 9 | 121.97 | 121.04 | 0.0000 | 0.00 |
| 10 | 136.28 | 135.35 | 0.0000 | 0.00 |
| 11 | 165.61 | 164.70 | 0.0000 | 0.00 |
| 12 | 227.31 | 226.41 | 0.0000 | 0.00 |
| 13 | 274.98 | 274.10 | 0.0000 | 0.00 |
| 14 | 310.61 | 309.75 | 0.0000 | 0.00 |
| 15 | 346.36 | 345.50 | 0.0000 | 0.00 |
| 16 | 484.94 | 484.13 | 0.0000 | 0.00 |
| 17 | 500.09 | 499.29 | 0.0000 | 0.00 |
| 18 | 575.08 | 574.31 | 0.0000 | 0.00 |
| 19 | 661.50 | 660.76 | 0.0000 | 0.00 |
| 20 | 784.58 | 783.89 | 0.0000 | 0.00 |
| 21 | 980.10 | 979.49 | 0.0000 | 0.00 |
| 22 | 1172.96 | 1172.44 | 0.0000 | 0.00 |
| 23 | 1204.49 | 1203.99 | 0.0000 | 0.00 |
| 24 | 1290.38 | 1289.92 | 0.0000 | 0.00 |
| 25 | 1313.92 | 1313.47 | 0.0000 | 0.00 |
| 26 | 1332.16 | 1331.72 | 0.0000 | 0.00 |
| 27 | 1497.51 | 1497.15 | 0.0000 | 0.00 |
| 28 | 1835.49 | 1835.32 | 0.0000 | 0.00 |
| 29 | 1847.54 | 1847.38 | 0.0000 | 0.00 |
| 30 | 1875.04 | 1874.89 | 0.0000 | 0.00 |
| 31 | 2049.49 | 2049.45 | 0.0000 | 0.00 |
| 32 | 2175.07 | 2175.10 | 0.0000 | 0.00 |
| 33 | 2249.97 | 2250.05 | 0.0000 | 0.00 |
| 34 | 2259.69 | 2259.77 | 0.0000 | 0.00 |
| 35 | 2280.19 | 2280.29 | 0.0000 | 0.00 |
| 36 | 2344.20 | 2344.33 | 0.0000 | 0.00 |
| 37 | 2504.99 | 2505.23 | 0.0000 | 0.00 |
| 38 | 2613.35 | 2613.67 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-01

GAS-1402

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 9:18:52AM

Peak Analysis From Channel : 1

Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 22.43 | 19 - | 25 | 21.48 | 8.93E+04 | 824.16 | 5.94E+04 | 2.27 |
| | 2 | 31.99 | 29 - | 34 | 31.04 | 1.51E+03 | 239.20 | 1.03E+04 | 2.35 |
| M | 3 | 50.61 | 43 - | 62 | 49.66 | 1.10E+04 | 554.48 | 3.33E+04 | 3.77 |
| m | 4 | 55.57 | 43 - | 62 | 54.62 | 8.52E+03 | 626.18 | 2.57E+04 | 3.13 |
| m | 5 | 59.40 | 43 - | 62 | 58.45 | 8.15E+04 | 664.22 | 1.77E+04 | 2.36 |
| | 6 | 68.12 | 64 - | 71 | 67.17 | 8.47E+02 | 353.49 | 2.04E+04 | 3.94 |
| M | 7 | 84.21 | 80 - | 92 | 83.27 | 1.05E+03 | 342.97 | 1.74E+04 | 3.64 |
| m | 8 | 87.98 | 80 - | 92 | 87.04 | 2.57E+04 | 408.17 | 1.20E+04 | 2.14 |
| | 9 | 121.97 | 116 - | 125 | 121.04 | 4.46E+03 | 335.26 | 1.35E+04 | 2.21 |
| | 10 | 136.28 | 132 - | 139 | 135.35 | 6.19E+02 | 249.57 | 9.98E+03 | 2.30 |
| | 11 | 165.61 | 162 - | 168 | 164.70 | 3.86E+02 | 213.36 | 8.01E+03 | 2.72 |
| | 12 | 227.31 | 224 - | 230 | 226.41 | 2.28E+02 | 210.15 | 7.86E+03 | 2.70 |
| | 13 | 274.98 | 272 - | 277 | 274.10 | 1.34E+02 | 159.20 | 4.95E+03 | 2.98 |
| | 14 | 310.61 | 307 - | 313 | 309.75 | 1.66E+02 | 170.93 | 5.21E+03 | 1.32 |
| | 15 | 346.36 | 343 - | 348 | 345.50 | 1.47E+02 | 144.05 | 4.05E+03 | 2.92 |
| | 16 | 484.94 | 481 - | 487 | 484.13 | 1.48E+02 | 146.42 | 3.80E+03 | 2.14 |
| | 17 | 500.09 | 497 - | 502 | 499.29 | 1.10E+02 | 124.40 | 3.00E+03 | 1.78 |
| | 18 | 575.08 | 572 - | 577 | 574.31 | 8.56E+01 | 104.24 | 2.11E+03 | 3.62 |
| | 19 | 661.50 | 654 - | 667 | 660.76 | 1.53E+04 | 323.31 | 4.80E+03 | 2.46 |
| | 20 | 784.58 | 781 - | 787 | 783.89 | 1.24E+02 | 110.97 | 2.15E+03 | 2.18 |
| | 21 | 980.10 | 977 - | 982 | 979.49 | 1.05E+02 | 105.43 | 2.13E+03 | 3.61 |
| | 22 | 1172.96 | 1166 - | 1178 | 1172.44 | 1.20E+04 | 256.03 | 2.06E+03 | 2.66 |
| | 23 | 1204.49 | 1201 - | 1207 | 1203.99 | 7.35E+01 | 59.41 | 5.89E+02 | 3.59 |
| | 24 | 1290.38 | 1288 - | 1293 | 1289.92 | 2.48E+01 | 31.64 | 1.76E+02 | 1.72 |
| | 25 | 1313.92 | 1311 - | 1317 | 1313.47 | 4.02E+01 | 36.43 | 2.16E+02 | 3.74 |
| | 26 | 1332.16 | 1325 - | 1338 | 1331.72 | 1.08E+04 | 216.66 | 4.15E+02 | 2.71 |
| | 27 | 1497.51 | 1491 - | 1502 | 1497.15 | 2.48E+01 | 25.92 | 7.04E+01 | 7.27 |
| M | 28 | 1835.49 | 1831 - | 1855 | 1835.32 | 2.00E+01 | 20.40 | 5.22E+01 | 3.27 |
| m | 29 | 1847.54 | 1831 - | 1855 | 1847.38 | 1.78E+01 | 21.54 | 5.41E+01 | 3.28 |
| | 30 | 1875.04 | 1871 - | 1881 | 1874.89 | 1.62E+01 | 16.59 | 2.96E+01 | 7.61 |
| | 31 | 2049.49 | 2046 - | 2053 | 2049.45 | 1.07E+01 | 11.83 | 1.65E+01 | 3.27 |
| | 32 | 2175.07 | 2172 - | 2177 | 2175.10 | 1.21E+01 | 10.39 | 1.19E+01 | 2.39 |
| | 33 | 2249.97 | 2245 - | 2254 | 2250.05 | 1.06E+01 | 10.49 | 8.80E+00 | 2.65 |
| | 34 | 2259.69 | 2256 - | 2263 | 2259.77 | 1.39E+01 | 10.20 | 8.22E+00 | 5.63 |
| | 35 | 2280.19 | 2276 - | 2283 | 2280.29 | 1.04E+01 | 12.49 | 1.71E+01 | 1.76 |
| | 36 | 2344.20 | 2340 - | 2347 | 2344.33 | 1.20E+01 | 6.93 | 0.00E+00 | 1.92 |
| | 37 | 2504.99 | 2501 - | 2510 | 2505.23 | 8.10E+01 | 18.00 | 0.00E+00 | 4.09 |
| | 38 | 2613.35 | 2609 - | 2617 | 2613.67 | 1.50E+01 | 7.75 | 0.00E+00 | 3.87 |

Analysis Report for 1707087-01

GAS-1402

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 9:18:52AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 22.43 | 19 - | 25 | 8.93E+04 | 824.16 | 5.94E+04 | 4.66E+02 |
| | 2 | 31.99 | 29 - | 34 | 1.51E+03 | 239.20 | 1.03E+04 | 1.86E+02 |
| M | 3 | 50.61 | 43 - | 62 | 1.10E+04 | 554.48 | 3.33E+04 | 3.00E+02 |
| m | 4 | 55.57 | 43 - | 62 | 8.52E+03 | 626.18 | 2.57E+04 | 2.64E+02 |
| m | 5 | 59.40 | 43 - | 62 | 8.15E+04 | 664.22 | 1.77E+04 | 2.18E+02 |
| | 6 | 68.12 | 64 - | 71 | 8.47E+02 | 353.49 | 2.04E+04 | 2.87E+02 |
| M | 7 | 84.21 | 80 - | 92 | 1.05E+03 | 342.97 | 1.74E+04 | 2.17E+02 |
| m | 8 | 87.98 | 80 - | 92 | 2.57E+04 | 408.17 | 1.20E+04 | 1.80E+02 |
| | 9 | 121.97 | 116 - | 125 | 4.46E+03 | 335.26 | 1.35E+04 | 2.53E+02 |
| | 10 | 136.28 | 132 - | 139 | 6.19E+02 | 249.57 | 9.98E+03 | 2.01E+02 |
| | 11 | 165.61 | 162 - | 168 | 3.86E+02 | 213.36 | 8.01E+03 | 1.72E+02 |
| | 12 | 227.31 | 224 - | 230 | 2.28E+02 | 210.15 | 7.86E+03 | 1.71E+02 |
| | 13 | 274.98 | 272 - | 277 | 1.34E+02 | 159.20 | 4.95E+03 | 1.29E+02 |
| | 14 | 310.61 | 307 - | 313 | 1.66E+02 | 170.93 | 5.21E+03 | 1.39E+02 |
| | 15 | 346.36 | 343 - | 348 | 1.47E+02 | 144.05 | 4.05E+03 | 1.17E+02 |
| | 16 | 484.94 | 481 - | 487 | 1.48E+02 | 146.42 | 3.80E+03 | 1.19E+02 |
| | 17 | 500.09 | 497 - | 502 | 1.10E+02 | 124.40 | 3.00E+03 | 1.01E+02 |
| | 18 | 575.08 | 572 - | 577 | 8.56E+01 | 104.24 | 2.11E+03 | 8.43E+01 |
| | 19 | 661.50 | 654 - | 667 | 1.53E+04 | 323.31 | 4.80E+03 | 1.71E+02 |
| | 20 | 784.58 | 781 - | 787 | 1.24E+02 | 110.97 | 2.15E+03 | 8.94E+01 |
| | 21 | 980.10 | 977 - | 982 | 1.05E+02 | 105.43 | 2.13E+03 | 8.50E+01 |
| | 22 | 1172.96 | 1166 - | 1178 | 1.20E+04 | 256.03 | 2.06E+03 | 1.09E+02 |
| | 23 | 1204.49 | 1201 - | 1207 | 7.35E+01 | 59.41 | 5.89E+02 | 4.68E+01 |
| | 24 | 1290.38 | 1288 - | 1293 | 2.48E+01 | 31.64 | 1.76E+02 | 2.47E+01 |
| | 25 | 1313.92 | 1311 - | 1317 | 4.02E+01 | 36.43 | 2.16E+02 | 2.81E+01 |
| | 26 | 1332.16 | 1325 - | 1338 | 1.08E+04 | 216.66 | 4.15E+02 | 5.05E+01 |
| | 27 | 1497.51 | 1491 - | 1502 | 2.48E+01 | 25.92 | 7.04E+01 | 1.97E+01 |
| M | 28 | 1835.49 | 1831 - | 1855 | 2.00E+01 | 20.40 | 5.22E+01 | 1.19E+01 |
| m | 29 | 1847.54 | 1831 - | 1855 | 1.78E+01 | 21.54 | 5.41E+01 | 1.21E+01 |
| | 30 | 1875.04 | 1871 - | 1881 | 1.62E+01 | 16.59 | 2.96E+01 | 1.19E+01 |
| | 31 | 2049.49 | 2046 - | 2053 | 1.07E+01 | 11.83 | 1.65E+01 | 8.10E+00 |

Analysis Report for 1707087-01

GAS-1402

| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 32 | 2175.07 | 2172 - | 2177 | 1.21E+01 | 10.39 | 1.19E+01 | 6.36E+00 |
| 33 | 2249.97 | 2245 - | 2254 | 1.06E+01 | 10.49 | 8.80E+00 | 6.76E+00 |
| 34 | 2259.69 | 2256 - | 2263 | 1.39E+01 | 10.20 | 8.22E+00 | 5.72E+00 |
| 35 | 2280.19 | 2276 - | 2283 | 1.04E+01 | 12.49 | 1.71E+01 | 8.78E+00 |
| 36 | 2344.20 | 2340 - | 2347 | 1.20E+01 | 6.93 | 0.00E+00 | 0.00E+00 |
| 37 | 2504.99 | 2501 - | 2510 | 8.10E+01 | 18.00 | 0.00E+00 | 0.00E+00 |
| 38 | 2613.35 | 2609 - | 2617 | 1.50E+01 | 7.75 | 0.00E+00 | 0.00E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 9:18:52AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 22.43 | 19 - | 25 | 21.48 | 8.93E+04 | 824.16 | 5.94E+04 | ..... |
| | 2 | 31.99 | 29 - | 34 | 31.04 | 1.51E+03 | 239.20 | 1.03E+04 | ..... |
| M | 3 | 50.61 | 43 - | 62 | 49.66 | 1.10E+04 | 554.48 | 3.33E+04 | TH-227 |
| | | | | | | | | | TE-132 |
| m | 4 | 55.57 | 43 - | 62 | 54.62 | 8.52E+03 | 626.18 | 2.57E+04 | ..... |
| m | 5 | 59.40 | 43 - | 62 | 58.45 | 8.15E+04 | 664.22 | 1.77E+04 | AM-241 |
| | 6 | 68.12 | 64 - | 71 | 67.17 | 8.47E+02 | 353.49 | 2.04E+04 | TI-44 |
| | | | | | | | | | TA-182 |
| | | | | | | | | | TH-230 |
| | | | | | | | | | HF-172 |
| M | 7 | 84.21 | 80 - | 92 | 83.27 | 1.05E+03 | 342.97 | 1.74E+04 | TH-231 |
| m | 8 | 87.98 | 80 - | 92 | 87.04 | 2.57E+04 | 408.17 | 1.20E+04 | CD-109 |
| | | | | | | | | | LU-176 |
| | | | | | | | | | SN-126 |
| | 9 | 121.97 | 116 - | 125 | 121.04 | 4.46E+03 | 335.26 | 1.35E+04 | CO-57 |
| | | | | | | | | | EU-152 |
| | | | | | | | | | SE-75 |
| | 10 | 136.28 | 132 - | 139 | 135.35 | 6.19E+02 | 249.57 | 9.98E+03 | CO-57 |
| | | | | | | | | | SE-75 |

Analysis Report for 1707087-01

GAS-1402

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 11 | 165.61 | 162 - | 168 | 164.70 | 3.86E+02 | 213.36 | 8.01E+03 | CE-139 |
| | 12 | 227.31 | 224 - | 230 | 226.41 | 2.28E+02 | 210.15 | 7.86E+03 | CM-243<br>TE-132<br>NP-239 |
| | 13 | 274.98 | 272 - | 277 | 274.10 | 1.34E+02 | 159.20 | 4.95E+03 | ..... |
| | 14 | 310.61 | 307 - | 313 | 309.75 | 1.66E+02 | 170.93 | 5.21E+03 | ..... |
| | 15 | 346.36 | 343 - | 348 | 345.50 | 1.47E+02 | 144.05 | 4.05E+03 | HF-181 |
| | 16 | 484.94 | 481 - | 487 | 484.13 | 1.48E+02 | 146.42 | 3.80E+03 | ..... |
| | 17 | 500.09 | 497 - | 502 | 499.29 | 1.10E+02 | 124.40 | 3.00E+03 | ..... |
| | 18 | 575.08 | 572 - | 577 | 574.31 | 8.56E+01 | 104.24 | 2.11E+03 | ..... |
| | 19 | 661.50 | 654 - | 667 | 660.76 | 1.53E+04 | 323.31 | 4.80E+03 | CS-137 |
| | 20 | 784.58 | 781 - | 787 | 783.89 | 1.24E+02 | 110.97 | 2.15E+03 | SB-127 |
| | 21 | 980.10 | 977 - | 982 | 979.49 | 1.05E+02 | 105.43 | 2.13E+03 | ..... |
| | 22 | 1172.96 | 1166 - | 1178 | 1172.44 | 1.20E+04 | 256.03 | 2.06E+03 | CO-60 |
| | 23 | 1204.49 | 1201 - | 1207 | 1203.99 | 7.35E+01 | 59.41 | 5.89E+02 | ..... |
| | 24 | 1290.38 | 1288 - | 1293 | 1289.92 | 2.48E+01 | 31.64 | 1.76E+02 | ..... |
| | 25 | 1313.92 | 1311 - | 1317 | 1313.47 | 4.02E+01 | 36.43 | 2.16E+02 | ..... |
| | 26 | 1332.16 | 1325 - | 1338 | 1331.72 | 1.08E+04 | 216.66 | 4.15E+02 | CO-60 |
| | 27 | 1497.51 | 1491 - | 1502 | 1497.15 | 2.48E+01 | 25.92 | 7.04E+01 | ..... |
| M | 28 | 1835.49 | 1831 - | 1855 | 1835.32 | 2.00E+01 | 20.40 | 5.22E+01 | Y-88 |
| m | 29 | 1847.54 | 1831 - | 1855 | 1847.38 | 1.78E+01 | 21.54 | 5.41E+01 | ..... |
| | 30 | 1875.04 | 1871 - | 1881 | 1874.89 | 1.62E+01 | 16.59 | 2.96E+01 | ..... |
| | 31 | 2049.49 | 2046 - | 2053 | 2049.45 | 1.07E+01 | 11.83 | 1.65E+01 | ..... |
| | 32 | 2175.07 | 2172 - | 2177 | 2175.10 | 1.21E+01 | 10.39 | 1.19E+01 | ..... |
| | 33 | 2249.97 | 2245 - | 2254 | 2250.05 | 1.06E+01 | 10.49 | 8.80E+00 | ..... |
| | 34 | 2259.69 | 2256 - | 2263 | 2259.77 | 1.39E+01 | 10.20 | 8.22E+00 | ..... |
| | 35 | 2280.19 | 2276 - | 2283 | 2280.29 | 1.04E+01 | 12.49 | 1.71E+01 | ..... |
| | 36 | 2344.20 | 2340 - | 2347 | 2344.33 | 1.20E+01 | 6.93 | 0.00E+00 | ..... |
| | 37 | 2504.99 | 2501 - | 2510 | 2505.23 | 8.10E+01 | 18.00 | 0.00E+00 | ..... |
| | 38 | 2613.35 | 2609 - | 2617 | 2613.67 | 1.50E+01 | 7.75 | 0.00E+00 | ..... |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 9:18:52AM

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|

Analysis Report for 1707087-01

GAS-1402

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 22.43 | 8.93E+04 | 824.16 | 3.87E-03 | 1.56E-03 |
| | 2 | 31.99 | 1.51E+03 | 239.20 | 9.08E-03 | 1.56E-03 |
| M | 3 | 50.61 | 1.10E+04 | 554.48 | 1.80E-02 | 1.56E-03 |
| m | 4 | 55.57 | 8.52E+03 | 626.18 | 1.97E-02 | 1.56E-03 |
| m | 5 | 59.40 | 8.15E+04 | 664.22 | 2.07E-02 | 1.56E-03 |
| | 6 | 68.12 | 8.47E+02 | 353.49 | 2.24E-02 | 1.74E-03 |
| M | 7 | 84.21 | 1.05E+03 | 342.97 | 2.36E-02 | 2.08E-03 |
| m | 8 | 87.98 | 2.57E+04 | 408.17 | 2.37E-02 | 2.17E-03 |
| | 9 | 121.97 | 4.46E+03 | 335.26 | 2.21E-02 | 1.65E-03 |
| | 10 | 136.28 | 6.19E+02 | 249.57 | 2.09E-02 | 1.60E-03 |
| | 11 | 165.61 | 3.86E+02 | 213.36 | 1.85E-02 | 1.50E-03 |
| | 12 | 227.31 | 2.28E+02 | 210.15 | 1.42E-02 | 1.20E-03 |
| | 13 | 274.98 | 1.34E+02 | 159.20 | 1.18E-02 | 9.67E-04 |
| | 14 | 310.61 | 1.66E+02 | 170.93 | 1.05E-02 | 8.81E-04 |
| | 15 | 346.36 | 1.47E+02 | 144.05 | 9.37E-03 | 8.06E-04 |
| | 16 | 484.94 | 1.48E+02 | 146.42 | 6.62E-03 | 6.72E-04 |
| | 17 | 500.09 | 1.10E+02 | 124.40 | 6.42E-03 | 6.66E-04 |
| | 18 | 575.08 | 8.56E+01 | 104.24 | 5.58E-03 | 6.35E-04 |
| | 19 | 661.50 | 1.53E+04 | 323.31 | 4.87E-03 | 5.99E-04 |
| | 20 | 784.58 | 1.24E+02 | 110.97 | 4.15E-03 | 4.44E-04 |
| | 21 | 980.10 | 1.05E+02 | 105.43 | 3.39E-03 | 2.83E-04 |
| | 22 | 1172.96 | 1.20E+04 | 256.03 | 2.90E-03 | 2.38E-04 |
| | 23 | 1204.49 | 7.35E+01 | 59.41 | 2.83E-03 | 2.35E-04 |
| | 24 | 1290.38 | 2.48E+01 | 31.64 | 2.66E-03 | 2.30E-04 |
| | 25 | 1313.92 | 4.02E+01 | 36.43 | 2.62E-03 | 2.28E-04 |
| | 26 | 1332.16 | 1.08E+04 | 216.66 | 2.59E-03 | 2.27E-04 |
| | 27 | 1497.51 | 2.48E+01 | 25.92 | 2.33E-03 | 2.02E-04 |
| M | 28 | 1835.49 | 2.00E+01 | 20.40 | 1.92E-03 | 1.51E-04 |
| m | 29 | 1847.54 | 1.78E+01 | 21.54 | 1.91E-03 | 1.51E-04 |
| | 30 | 1875.04 | 1.62E+01 | 16.59 | 1.88E-03 | 1.51E-04 |
| | 31 | 2049.49 | 1.07E+01 | 11.83 | 1.71E-03 | 1.51E-04 |
| | 32 | 2175.07 | 1.21E+01 | 10.39 | 1.61E-03 | 1.51E-04 |
| | 33 | 2249.97 | 1.06E+01 | 10.49 | 1.54E-03 | 1.51E-04 |
| | 34 | 2259.69 | 1.39E+01 | 10.20 | 1.54E-03 | 1.51E-04 |
| | 35 | 2280.19 | 1.04E+01 | 12.49 | 1.52E-03 | 1.51E-04 |
| | 36 | 2344.20 | 1.20E+01 | 6.93 | 1.47E-03 | 1.51E-04 |
| | 37 | 2504.99 | 8.10E+01 | 18.00 | 1.35E-03 | 1.51E-04 |
| | 38 | 2613.35 | 1.50E+01 | 7.75 | 1.28E-03 | 1.51E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 9:18:52AM

Analysis Report for 1707087-01

GAS-1402

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 22.43 | 8.93E+04 | 824.16 | 2.18E+01 | 1.83E+00 | 8.93E+04 | 8.24E+02 |
| | 2 | 31.99 | 1.51E+03 | 239.20 | | | 1.51E+03 | 2.39E+02 |
| M | 3 | 50.61 | 1.10E+04 | 554.48 | | | 1.10E+04 | 5.54E+02 |
| m | 4 | 55.57 | 8.52E+03 | 626.18 | | | 8.52E+03 | 6.26E+02 |
| m | 5 | 59.40 | 8.15E+04 | 664.22 | | | 8.15E+04 | 6.64E+02 |
| | 6 | 68.12 | 8.47E+02 | 353.49 | | | 8.47E+02 | 3.53E+02 |
| M | 7 | 84.21 | 1.05E+03 | 342.97 | | | 1.05E+03 | 3.43E+02 |
| m | 8 | 87.98 | 2.57E+04 | 408.17 | | | 2.57E+04 | 4.08E+02 |
| | 9 | 121.97 | 4.46E+03 | 335.26 | | | 4.46E+03 | 3.35E+02 |
| | 10 | 136.28 | 6.19E+02 | 249.57 | | | 6.19E+02 | 2.50E+02 |
| | 11 | 165.61 | 3.86E+02 | 213.36 | | | 3.86E+02 | 2.13E+02 |
| | 12 | 227.31 | 2.28E+02 | 210.15 | | | 2.28E+02 | 2.10E+02 |
| | 13 | 274.98 | 1.34E+02 | 159.20 | | | 1.34E+02 | 1.59E+02 |
| | 14 | 310.61 | 1.66E+02 | 170.93 | | | 1.66E+02 | 1.71E+02 |
| | 15 | 346.36 | 1.47E+02 | 144.05 | | | 1.47E+02 | 1.44E+02 |
| | 16 | 484.94 | 1.48E+02 | 146.42 | | | 1.48E+02 | 1.46E+02 |
| | 17 | 500.09 | 1.10E+02 | 124.40 | | | 1.10E+02 | 1.24E+02 |
| | 18 | 575.08 | 8.56E+01 | 104.24 | | | 8.56E+01 | 1.04E+02 |
| | 19 | 661.50 | 1.53E+04 | 323.31 | | | 1.53E+04 | 3.23E+02 |
| | 20 | 784.58 | 1.24E+02 | 110.97 | | | 1.24E+02 | 1.11E+02 |
| | 21 | 980.10 | 1.05E+02 | 105.43 | | | 1.05E+02 | 1.05E+02 |
| | 22 | 1172.96 | 1.20E+04 | 256.03 | | | 1.20E+04 | 2.56E+02 |
| | 23 | 1204.49 | 7.35E+01 | 59.41 | | | 7.35E+01 | 5.94E+01 |
| | 24 | 1290.38 | 2.48E+01 | 31.64 | | | 2.48E+01 | 3.16E+01 |
| | 25 | 1313.92 | 4.02E+01 | 36.43 | | | 4.02E+01 | 3.64E+01 |
| | 26 | 1332.16 | 1.08E+04 | 216.66 | | | 1.08E+04 | 2.17E+02 |
| | 27 | 1497.51 | 2.48E+01 | 25.92 | | | 2.48E+01 | 2.59E+01 |
| M | 28 | 1835.49 | 2.00E+01 | 20.40 | | | 2.00E+01 | 2.04E+01 |
| m | 29 | 1847.54 | 1.78E+01 | 21.54 | | | 1.78E+01 | 2.15E+01 |
| | 30 | 1875.04 | 1.62E+01 | 16.59 | | | 1.62E+01 | 1.66E+01 |
| | 31 | 2049.49 | 1.07E+01 | 11.83 | | | 1.07E+01 | 1.18E+01 |
| | 32 | 2175.07 | 1.21E+01 | 10.39 | | | 1.21E+01 | 1.04E+01 |
| | 33 | 2249.97 | 1.06E+01 | 10.49 | | | 1.06E+01 | 1.05E+01 |
| | 34 | 2259.69 | 1.39E+01 | 10.20 | | | 1.39E+01 | 1.02E+01 |
| | 35 | 2280.19 | 1.04E+01 | 12.49 | | | 1.04E+01 | 1.25E+01 |
| | 36 | 2344.20 | 1.20E+01 | 6.93 | | | 1.20E+01 | 6.93E+00 |
| | 37 | 2504.99 | 8.10E+01 | 18.00 | | | 8.10E+01 | 1.80E+01 |
| | 38 | 2613.35 | 1.50E+01 | 7.75 | | | 1.50E+01 | 7.75E+00 |

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

Analysis Report for 1707087-01

GAS-1402

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 9:18:52AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 22.43 | 8.93E+04 | 824.16 | 2.18E+01 | 1.83E+00 | 8.93E+04 | 8.24E+02 |
| | 2 | 31.99 | 1.51E+03 | 239.20 | | | 1.51E+03 | 2.39E+02 |
| M | 3 | 50.61 | 1.10E+04 | 554.48 | | | 1.10E+04 | 5.54E+02 |
| m | 4 | 55.57 | 8.52E+03 | 626.18 | | | 8.52E+03 | 6.26E+02 |
| m | 5 | 59.40 | 8.15E+04 | 664.22 | | | 8.15E+04 | 6.64E+02 |
| | 6 | 68.12 | 8.47E+02 | 353.49 | | | 8.47E+02 | 3.53E+02 |
| M | 7 | 84.21 | 1.05E+03 | 342.97 | | | 1.05E+03 | 3.43E+02 |
| m | 8 | 87.98 | 2.57E+04 | 408.17 | | | 2.57E+04 | 4.08E+02 |
| | 9 | 121.97 | 4.46E+03 | 335.26 | | | 4.46E+03 | 3.35E+02 |
| | 10 | 136.28 | 6.19E+02 | 249.57 | | | 6.19E+02 | 2.50E+02 |
| | 11 | 165.61 | 3.86E+02 | 213.36 | | | 3.86E+02 | 2.13E+02 |
| | 12 | 227.31 | 2.28E+02 | 210.15 | | | 2.28E+02 | 2.10E+02 |
| | 13 | 274.98 | 1.34E+02 | 159.20 | | | 1.34E+02 | 1.59E+02 |
| | 14 | 310.61 | 1.66E+02 | 170.93 | | | 1.66E+02 | 1.71E+02 |
| | 15 | 346.36 | 1.47E+02 | 144.05 | | | 1.47E+02 | 1.44E+02 |
| | 16 | 484.94 | 1.48E+02 | 146.42 | | | 1.48E+02 | 1.46E+02 |
| | 17 | 500.09 | 1.10E+02 | 124.40 | | | 1.10E+02 | 1.24E+02 |
| | 18 | 575.08 | 8.56E+01 | 104.24 | | | 8.56E+01 | 1.04E+02 |
| | 19 | 661.50 | 1.53E+04 | 323.31 | | | 1.53E+04 | 3.23E+02 |
| | 20 | 784.58 | 1.24E+02 | 110.97 | | | 1.24E+02 | 1.11E+02 |
| | 21 | 980.10 | 1.05E+02 | 105.43 | | | 1.05E+02 | 1.05E+02 |
| | 22 | 1172.96 | 1.20E+04 | 256.03 | | | 1.20E+04 | 2.56E+02 |
| | 23 | 1204.49 | 7.35E+01 | 59.41 | | | 7.35E+01 | 5.94E+01 |
| | 24 | 1290.38 | 2.48E+01 | 31.64 | | | 2.48E+01 | 3.16E+01 |
| | 25 | 1313.92 | 4.02E+01 | 36.43 | | | 4.02E+01 | 3.64E+01 |
| | 26 | 1332.16 | 1.08E+04 | 216.66 | | | 1.08E+04 | 2.17E+02 |
| | 27 | 1497.51 | 2.48E+01 | 25.92 | | | 2.48E+01 | 2.59E+01 |
| M | 28 | 1835.49 | 2.00E+01 | 20.40 | | | 2.00E+01 | 2.04E+01 |
| m | 29 | 1847.54 | 1.78E+01 | 21.54 | | | 1.78E+01 | 2.15E+01 |
| | 30 | 1875.04 | 1.62E+01 | 16.59 | | | 1.62E+01 | 1.66E+01 |
| | 31 | 2049.49 | 1.07E+01 | 11.83 | | | 1.07E+01 | 1.18E+01 |
| | 32 | 2175.07 | 1.21E+01 | 10.39 | | | 1.21E+01 | 1.04E+01 |
| | 33 | 2249.97 | 1.06E+01 | 10.49 | | | 1.06E+01 | 1.05E+01 |
| | 34 | 2259.69 | 1.39E+01 | 10.20 | | | 1.39E+01 | 1.02E+01 |
| | 35 | 2280.19 | 1.04E+01 | 12.49 | | | 1.04E+01 | 1.25E+01 |
| | 36 | 2344.20 | 1.20E+01 | 6.93 | | | 1.20E+01 | 6.93E+00 |
| | 37 | 2504.99 | 8.10E+01 | 18.00 | | | 8.10E+01 | 1.80E+01 |
| | 38 | 2613.35 | 1.50E+01 | 7.75 | | | 1.50E+01 | 7.75E+00 |

Analysis Report for 1707087-01
GAS-1402

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| CO-57 | 0.925 | 122.06 | * | 85.51 | 7.17E+01 | 7.66E+00 |
| | | 136.48 | * | 10.60 | 8.48E+01 | 3.49E+01 |
| CO-60 | 0.985 | 1173.22 | * | 100.00 | 1.24E+02 | 1.05E+01 |
| | | 1332.49 | * | 100.00 | 1.24E+02 | 1.12E+01 |
| CD-109 | 0.974 | 88.03 | * | 3.72 | 2.88E+03 | 3.18E+02 |
| SN-126 | 0.973 | 87.57 | * | 37.00 | 5.98E+01 | 5.55E+00 |
| CS-137 | 0.996 | 661.65 | * | 85.12 | 8.05E+01 | 1.01E+01 |
| CE-139 | 0.738 | 165.85 | * | 80.35 | 1.08E+02 | 6.03E+01 |
| AM-241 | 0.997 | 59.54 | * | 35.90 | 2.25E+02 | 1.71E+01 |

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 9:18:52AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 1 | 22.43 | 4.96089E+01 | 0.46 | | |

Analysis Report for 1707087-01

GAS-1402

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 2 | 31.99 | 8.37038E-01 | 7.94 | | |
| M | 3 | 50.61 | 6.12984E+00 | 2.51 | Tol. | TE-132 |
| | | | | | | TH-227 |
| m | 4 | 55.57 | 4.73155E+00 | 3.68 | | |
| | 6 | 68.12 | 4.70755E-01 | 20.86 | Tol. | TI-44 |
| | | | | | | HF-172 |
| | | | | | | TA-182 |
| | | | | | | TH-230 |
| M | 7 | 84.21 | 5.84228E-01 | 16.31 | Tol. | TH-231 |
| | 12 | 227.31 | 1.26620E-01 | 46.10 | Tol. | TE-132 |
| | | | | | | NP-239 |
| | | | | | | CM-243 |
| | 13 | 274.98 | 7.44764E-02 | 59.38 | | |
| | 14 | 310.61 | 9.21189E-02 | 51.54 | D-Esc | |
| | 15 | 346.36 | 8.15323E-02 | 49.08 | Tol. | HF-181 |
| | 16 | 484.94 | 8.23762E-02 | 49.37 | | |
| | 17 | 500.09 | 6.13761E-02 | 56.30 | | |
| | 18 | 575.08 | 4.75646E-02 | 60.87 | | |
| | 20 | 784.58 | 6.89439E-02 | 44.71 | Tol. | SB-127 |
| | 21 | 980.10 | 5.84974E-02 | 50.06 | | |
| | 23 | 1204.49 | 4.08182E-02 | 40.43 | | |
| | 24 | 1290.38 | 1.38029E-02 | 63.67 | | |
| | 25 | 1313.92 | 2.23348E-02 | 45.31 | | |
| | 27 | 1497.51 | 1.37778E-02 | 52.26 | Sum | |
| M | 28 | 1835.49 | 1.11051E-02 | 51.02 | Tol. | Y-88 |
| m | 29 | 1847.54 | 9.88899E-03 | 60.51 | | |
| | 30 | 1875.04 | 9.00538E-03 | 51.18 | | |
| | 31 | 2049.49 | 5.96491E-03 | 55.10 | | |
| | 32 | 2175.07 | 6.69753E-03 | 43.10 | | |
| | 33 | 2249.97 | 5.88889E-03 | 49.47 | | |
| | 34 | 2259.69 | 7.71605E-03 | 36.71 | | |
| | 35 | 2280.19 | 5.80409E-03 | 59.78 | | |
| | 36 | 2344.20 | 6.66667E-03 | 28.87 | | |
| | 37 | 2504.99 | 4.50000E-02 | 11.11 | Sum | |
| | 38 | 2613.35 | 8.33333E-03 | 25.82 | | |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

Analysis Report for 1707087-01

GAS-1402

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| CO-57 | 0.92 | 122.06 | * | 85.51 | 7.17E+01 | 7.66E+00 |
| | | 136.48 | * | 10.60 | 8.48E+01 | 3.49E+01 |
| CO-60 | 0.98 | 1173.22 | * | 100.00 | 1.24E+02 | 1.05E+01 |
| | | 1332.49 | * | 100.00 | 1.24E+02 | 1.12E+01 |
| CD-109 | 0.97 | 88.03 | * | 3.72 | 2.88E+03 | 3.18E+02 |
| SN-126 | 0.97 | 87.57 | * | 37.00 | 5.98E+01 | 5.55E+00 |
| CS-137 | 0.99 | 661.65 | * | 85.12 | 8.05E+01 | 1.01E+01 |
| CE-139 | 0.73 | 165.85 | * | 80.35 | 1.08E+02 | 6.03E+01 |
| AM-241 | 0.99 | 59.54 | * | 35.90 | 2.25E+02 | 1.71E+01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | CO-57 | 0.925 | 7.23E+01 | 7.49E+00 | |
| | CO-60 | 0.985 | 1.24E+02 | 7.65E+00 | |
| ? | CD-109 | 0.974 | 2.88E+03 | 3.18E+02 | |
| ? | SN-126 | 0.973 | 5.98E+01 | 5.55E+00 | |
| | CS-137 | 0.996 | 8.05E+01 | 1.01E+01 | |
| | CE-139 | 0.738 | 1.08E+02 | 6.03E+01 | |
| | AM-241 | 0.997 | 2.25E+02 | 1.71E+01 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-01
GAS-1402

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 9:18:52AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 22.43 | 4.96089E+01 | 0.46 | | |
| | 2 | 31.99 | 8.37038E-01 | 7.94 | | |
| M | 3 | 50.61 | 6.12984E+00 | 2.51 | Tol. | TE-132 |
| | | | | | | TH-227 |
| m | 4 | 55.57 | 4.73155E+00 | 3.68 | | |
| | 6 | 68.12 | 4.70755E-01 | 20.86 | Tol. | TI-44 |
| | | | | | | HF-172 |
| | | | | | | TA-182 |
| | | | | | | TH-230 |
| M | 7 | 84.21 | 5.84228E-01 | 16.31 | Tol. | TH-231 |
| | 12 | 227.31 | 1.26620E-01 | 46.10 | Tol. | TE-132 |
| | | | | | | NP-239 |
| | | | | | | CM-243 |
| | 13 | 274.98 | 7.44764E-02 | 59.38 | | |
| | 14 | 310.61 | 9.21189E-02 | 51.54 | D-Esc | |
| | 15 | 346.36 | 8.15323E-02 | 49.08 | Tol. | HF-181 |
| | 16 | 484.94 | 8.23762E-02 | 49.37 | | |
| | 17 | 500.09 | 6.13761E-02 | 56.30 | | |
| | 18 | 575.08 | 4.75646E-02 | 60.87 | | |
| | 20 | 784.58 | 6.89439E-02 | 44.71 | Tol. | SB-127 |
| | 21 | 980.10 | 5.84974E-02 | 50.06 | | |
| | 23 | 1204.49 | 4.08182E-02 | 40.43 | | |
| | 24 | 1290.38 | 1.38029E-02 | 63.67 | | |
| | 25 | 1313.92 | 2.23348E-02 | 45.31 | | |
| | 27 | 1497.51 | 1.37778E-02 | 52.26 | Sum | |
| M | 28 | 1835.49 | 1.11051E-02 | 51.02 | Tol. | Y-88 |
| m | 29 | 1847.54 | 9.88899E-03 | 60.51 | | |
| | 30 | 1875.04 | 9.00538E-03 | 51.18 | | |
| | 31 | 2049.49 | 5.96491E-03 | 55.10 | | |
| | 32 | 2175.07 | 6.69753E-03 | 43.10 | | |
| | 33 | 2249.97 | 5.88889E-03 | 49.47 | | |
| | 34 | 2259.69 | 7.71605E-03 | 36.71 | | |
| | 35 | 2280.19 | 5.80409E-03 | 59.78 | | |
| | 36 | 2344.20 | 6.66667E-03 | 28.87 | | |
| | 37 | 2504.99 | 4.50000E-02 | 11.11 | Sum | |

Analysis Report for 1707087-01

GAS-1402

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 38 | 2613.35 | 8.33333E-03 | 25.82 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | | 10.42 | 2.10E+06 | 5.76E+06 | 5.76E+06 |
| + | NA-22 | 1274.54 | | 99.94 | -1.79E-01 | 1.03E+00 | 1.03E+00 |
| + | @ NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | AL-26 | 1808.65 | | 99.76 | -8.13E-02 | 2.57E-01 | 2.57E-01 |
| + | K-40 | 1460.81 | | 10.67 | -7.80E-01 | 2.98E+00 | 2.98E+00 |
| + | @ AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | TI-44 | 67.88 | | 94.40 | 9.59E-01 | 4.27E-01 | 4.59E-01 |
| | | 78.34 | | 96.00 | -2.94E-02 | | 4.27E-01 |
| + | SC-46 | 889.25 | | 99.98 | -1.86E+03 | 6.60E+03 | 6.85E+03 |
| | | 1120.51 | | 99.99 | 1.76E+03 | | 6.60E+03 |
| + | @ V-48 | 983.52 | | 99.98 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1312.10 | | 97.50 | 1.00E+26 | | 1.00E+26 |
| + | CR-51 | 320.08 | | 9.83 | 1.51E+11 | 1.46E+12 | 1.46E+12 |
| + | MN-54 | 834.83 | | 99.97 | -1.46E-01 | 1.03E+01 | 1.03E+01 |
| + | CO-56 | 846.75 | | 99.96 | 3.48E+01 | 7.49E+03 | 1.11E+04 |
| | | 1037.75 | | 14.03 | 2.37E+04 | | 8.88E+04 |
| | | 1238.25 | | 67.00 | 4.58E+03 | | 9.45E+03 |
| | | 1771.40 | | 15.51 | -1.84E+03 | | 1.93E+04 |
| | | 2598.48 | | 16.90 | 0.00E+00 | | 7.49E+03 |
| + | CO-57 | 122.06 | * | 85.51 | 7.17E+01 | 8.19E+00 | 8.19E+00 |
| | | 136.48 | * | 10.60 | 8.48E+01 | | 5.55E+01 |
| + | CO-58 | 810.76 | | 99.40 | 1.50E+04 | 2.96E+04 | 2.96E+04 |
| + | FE-59 | 1099.22 | | 56.50 | -1.40E+07 | 1.48E+07 | 2.77E+07 |
| | | 1291.56 | | 43.20 | -1.94E+06 | | 1.48E+07 |
| + | CO-60 | 1173.22 | * | 100.00 | 1.24E+02 | 1.20E+00 | 2.27E+00 |
| | | 1332.49 | * | 100.00 | 1.24E+02 | | 1.20E+00 |
| + | ZN-65 | 1115.52 | | 50.75 | -4.56E+00 | 4.44E+01 | 4.44E+01 |

Analysis Report for 1707087-01

GAS-1402

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | @ | GA-67 | 93.31 | | 35.70 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 208.95 | | 2.24 | 1.00E+26 | | 1.00E+26 |
| | @ | | 300.22 | | 16.00 | 1.00E+26 | | 1.00E+26 |
| + | | SE-75 | 121.11 | | 16.70 | 1.10E+04 | 2.45E+02 | 1.12E+03 |
| | | | 136.00 | | 59.20 | 4.40E+02 | | 2.45E+02 |
| | | | 264.65 | | 59.80 | 1.10E+02 | | 3.33E+02 |
| | | | 279.53 | | 25.20 | 1.79E+01 | | 8.01E+02 |
| | | | 400.65 | | 11.40 | 6.43E+01 | | 2.34E+03 |
| + | | RB-82 | 776.52 | | 13.00 | 5.88E+12 | 1.89E+13 | 1.89E+13 |
| + | | RB-83 | 520.41 | | 46.00 | 1.38E+03 | 6.74E+03 | 6.74E+03 |
| | | | 529.64 | | 30.30 | 5.09E+03 | | 1.04E+04 |
| | | | 552.65 | | 16.40 | -6.11E+03 | | 1.82E+04 |
| + | | KR-85 | 513.99 | | 0.43 | -1.21E+01 | 1.80E+02 | 1.80E+02 |
| + | | SR-85 | 513.99 | | 99.27 | -3.51E+03 | 5.22E+04 | 5.22E+04 |
| + | | Y-88 | 898.02 | | 93.40 | -2.30E+02 | 4.16E+02 | 1.16E+03 |
| | | | 1836.01 | | 99.38 | 3.83E+02 | | 4.16E+02 |
| + | | MO-93 | 263.06 | | 56.72 | 6.10E-02 | 3.83E-01 | 9.28E-01 |
| | | | 684.67 | | 99.68 | -4.22E-01 | | 9.21E-01 |
| | | | 1477.11 | | 99.08 | 1.01E-01 | | 3.83E-01 |
| + | | NB-93M | 16.57 | | 9.43 | -3.93E+03 | 8.49E+01 | 8.49E+01 |
| + | | NB-94 | 702.63 | | 100.00 | 6.25E-02 | 7.80E-01 | 7.80E-01 |
| | | | 871.10 | | 100.00 | -5.18E-02 | | 1.07E+00 |
| + | | NB-95 | 765.79 | | 99.81 | 5.53E+08 | 1.04E+09 | 1.04E+09 |
| + | @ | NB-95M | 235.69 | | 25.00 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | ZR-95 | 724.18 | | 43.70 | -4.60E+04 | 1.43E+05 | 1.72E+05 |
| | | | 756.72 | | 55.30 | -6.12E+04 | | 1.43E+05 |
| + | @ | MO-99 | 181.06 | | 6.20 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 739.58 | | 12.80 | 1.00E+26 | | 1.00E+26 |
| | @ | | 778.00 | | 4.50 | 1.00E+26 | | 1.00E+26 |
| + | | RU-103 | 497.08 | | 89.00 | 1.75E+06 | 8.71E+07 | 8.71E+07 |
| + | | RU-106 | 621.84 | | 9.80 | 2.26E+01 | 5.02E+01 | 5.02E+01 |
| + | | AG-108M | 433.93 | | 89.90 | -1.69E-01 | 7.27E-01 | 7.27E-01 |
| | | | 614.37 | | 90.40 | -1.25E-01 | | 7.33E-01 |
| | | | 722.95 | | 90.50 | -1.97E-01 | | 9.11E-01 |
| + | | CD-109 | 88.03 | * | 3.72 | 2.88E+03 | 8.28E+01 | 8.28E+01 |
| + | | AG-110M | 657.75 | | 93.14 | 7.02E+02 | 2.27E+01 | 4.55E+01 |
| | | | 677.61 | | 10.53 | -6.52E+01 | | 1.34E+02 |
| | | | 706.67 | | 16.46 | -5.14E+00 | | 8.96E+01 |
| | | | 763.93 | | 21.98 | 8.59E+00 | | 7.49E+01 |
| | | | 884.67 | | 71.63 | -2.33E+00 | | 2.85E+01 |
| | | | 1384.27 | | 23.94 | -9.32E+00 | | 2.27E+01 |
| + | | CD-113M | 263.70 | | 0.02 | 5.93E+02 | 2.21E+03 | 2.21E+03 |
| + | | SN-113 | 255.12 | | 1.93 | 1.98E+03 | 5.11E+02 | 1.30E+04 |
| | | | 391.69 | | 64.90 | -1.95E+02 | | 5.11E+02 |
| + | | TE123M | 159.00 | | 84.10 | 3.55E+01 | 1.74E+02 | 1.74E+02 |
| + | | SB-124 | 602.71 | | 97.87 | -5.26E+03 | 1.15E+05 | 1.29E+05 |
| | | | 645.85 | | 7.26 | -4.44E+05 | | 1.80E+06 |
| | | | 722.78 | | 11.10 | -3.02E+05 | | 1.40E+06 |

Analysis Report for 1707087-01

GAS-1402

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | | SB-124 | 1691.02 | | 49.00 | 2.45E+04 | 1.15E+05 | 1.15E+05 |
| + | | I-125 | 35.49 | | 6.49 | -9.68E+05 | 2.16E+06 | 2.16E+06 |
| + | | SB-125 | 176.33 | | 6.89 | 8.95E+00 | 4.37E+00 | 1.05E+01 |
| | | | 427.89 | | 29.33 | -3.28E+00 | | 4.37E+00 |
| | | | 463.38 | | 10.35 | -4.78E+00 | | 1.38E+01 |
| | | | 600.56 | | 17.80 | -2.43E+00 | | 7.57E+00 |
| | | | 635.90 | | 11.32 | 6.69E+00 | | 1.25E+01 |
| + | @ | SB-126 | 414.70 | | 83.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 666.33 | | 99.60 | 1.00E+26 | | 1.00E+26 |
| | @ | | 695.00 | | 99.60 | 1.00E+26 | | 1.00E+26 |
| | @ | | 720.50 | | 53.80 | 1.00E+26 | | 1.00E+26 |
| + | | SN-126 | 87.57 | * | 37.00 | 5.98E+01 | 1.72E+00 | 1.72E+00 |
| + | @ | SB-127 | 473.00 | | 25.00 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 685.20 | | 35.70 | 1.00E+26 | | 1.00E+26 |
| | @ | | 783.80 | | 14.70 | 1.00E+26 | | 1.00E+26 |
| + | | I-129 | 29.78 | | 57.00 | -2.22E+01 | 1.99E+00 | 1.99E+00 |
| | | | 33.60 | | 13.20 | 3.04E+00 | | 6.44E+00 |
| | | | 39.58 | | 7.52 | -2.48E+01 | | 8.61E+00 |
| + | @ | I-131 | 284.30 | | 6.05 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 364.48 | | 81.20 | 1.00E+26 | | 1.00E+26 |
| | @ | | 636.97 | | 7.26 | 1.00E+26 | | 1.00E+26 |
| | @ | | 722.89 | | 1.80 | 1.00E+26 | | 1.00E+26 |
| + | @ | TE-132 | 49.72 | | 13.10 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 228.16 | | 88.00 | 1.00E+26 | | 1.00E+26 |
| + | | BA-133 | 81.00 | | 33.00 | -5.57E-01 | 1.06E+00 | 1.46E+00 |
| | | | 302.84 | | 17.80 | 2.72E+00 | | 3.21E+00 |
| | | | 356.01 | | 60.00 | 3.52E-01 | | 1.06E+00 |
| + | @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | @ | XE-133 | 81.00 | | 38.00 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | CS-134 | 563.23 | | 8.38 | -8.14E+00 | 1.81E+00 | 1.98E+01 |
| | | | 569.32 | | 15.43 | -1.88E+00 | | 1.06E+01 |
| | | | 604.70 | | 97.60 | 3.64E-01 | | 1.81E+00 |
| | | | 795.84 | | 85.40 | -3.39E-01 | | 2.83E+00 |
| | | | 801.93 | | 8.73 | -1.10E+00 | | 2.79E+01 |
| + | | CS-135 | 268.24 | | 16.00 | 1.23E+00 | 2.77E+00 | 2.77E+00 |
| + | @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | @ | CS-136 | 153.22 | | 7.46 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 163.89 | | 4.61 | 1.00E+26 | | 1.00E+26 |
| | @ | | 176.55 | | 13.56 | 1.00E+26 | | 1.00E+26 |
| | @ | | 273.65 | | 12.66 | 1.00E+26 | | 1.00E+26 |
| | @ | | 340.57 | | 48.50 | 1.00E+26 | | 1.00E+26 |
| | @ | | 818.50 | | 99.70 | 1.00E+26 | | 1.00E+26 |
| | @ | | 1048.07 | | 79.60 | 1.00E+26 | | 1.00E+26 |
| | @ | | 1235.34 | | 19.70 | 1.00E+26 | | 1.00E+26 |
| + | | CS-137 | 661.65 | * | 85.12 | 8.05E+01 | 1.81E+00 | 1.81E+00 |
| + | | LA-138 | 788.74 | | 34.00 | -3.15E-02 | 4.28E-01 | 2.67E+00 |

Analysis Report for 1707087-01

GAS-1402

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | | LA-138 | 1435.80 | | 66.00 | -7.29E-02 | 4.28E-01 | 4.28E-01 |
| + | | CE-139 | 165.85 | * | 80.35 | 1.08E+02 | 9.73E+01 | 9.73E+01 |
| + | @ | BA-140 | 162.64 | | 6.70 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 304.84 | | 4.50 | 1.00E+26 | | 1.00E+26 |
| | @ | | 423.70 | | 3.20 | 1.00E+26 | | 1.00E+26 |
| | @ | | 437.55 | | 2.00 | 1.00E+26 | | 1.00E+26 |
| | @ | | 537.32 | | 25.00 | 1.00E+26 | | 1.00E+26 |
| + | @ | LA-140 | 328.77 | | 20.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 487.03 | | 45.50 | 1.00E+26 | | 1.00E+26 |
| | @ | | 815.85 | | 23.50 | 1.00E+26 | | 1.00E+26 |
| | @ | | 1596.49 | | 95.49 | 1.00E+26 | | 1.00E+26 |
| + | | CE-141 | 145.44 | | 48.40 | 1.65E+09 | 3.92E+09 | 3.92E+09 |
| + | @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | | CE-144 | 133.54 | | 10.80 | -9.77E+00 | 3.84E+01 | 3.84E+01 |
| + | | PM-144 | 476.78 | | 42.00 | 1.31E+01 | 5.06E+00 | 1.23E+01 |
| | | | 618.01 | | 98.60 | -6.08E-01 | | 5.06E+00 |
| | | | 696.49 | | 99.49 | -9.92E-01 | | 5.79E+00 |
| + | | PM-145 | 36.85 | | 21.70 | -3.80E+00 | 1.84E+00 | 3.44E+00 |
| | | | 37.36 | | 39.70 | -2.03E+00 | | 1.84E+00 |
| | | | 42.30 | | 15.10 | -8.61E+00 | | 4.72E+00 |
| | | | 72.40 | | 2.31 | -1.85E+00 | | 2.00E+01 |
| + | | PM-146 | 453.90 | | 39.94 | 9.44E-01 | 2.53E+00 | 2.53E+00 |
| | | | 735.90 | | 14.01 | -1.67E+00 | | 8.47E+00 |
| | | | 747.13 | | 13.10 | 3.77E+00 | | 9.40E+00 |
| + | @ | ND-147 | 91.11 | | 28.90 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 531.02 | | 13.10 | 1.00E+26 | | 1.00E+26 |
| + | @ | PM-149 | 285.90 | | 3.10 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | EU-152 | 121.78 | | 20.50 | 2.30E+01 | 2.33E+00 | 2.33E+00 |
| | | | 244.69 | | 5.40 | -3.51E+00 | | 9.20E+00 |
| | | | 344.27 | | 19.13 | -8.65E-01 | | 3.05E+00 |
| | | | 778.89 | | 9.20 | -1.58E+00 | | 1.10E+01 |
| | | | 964.01 | | 10.40 | 7.95E+00 | | 1.41E+01 |
| | | | 1085.78 | | 7.22 | -6.64E+00 | | 1.95E+01 |
| | | | 1112.02 | | 9.60 | 6.28E+00 | | 1.44E+01 |
| | | | 1407.95 | | 14.94 | -3.85E-01 | | 2.37E+00 |
| + | | GD-153 | 97.43 | | 31.30 | 3.18E-01 | 1.88E+01 | 1.88E+01 |
| | | | 103.18 | | 22.20 | 2.19E+00 | | 2.68E+01 |
| + | | EU-154 | 123.07 | | 40.50 | 1.22E+01 | 1.28E+00 | 1.28E+00 |
| | | | 723.30 | | 19.70 | -1.38E+00 | | 5.18E+00 |
| | | | 873.19 | | 11.50 | 1.07E+00 | | 1.17E+01 |
| | | | 996.32 | | 10.30 | 7.09E+00 | | 1.39E+01 |
| | | | 1004.76 | | 17.90 | -2.19E+00 | | 8.08E+00 |
| | | | 1274.45 | | 35.50 | -2.92E-01 | | 1.68E+00 |
| + | | EU-155 | 86.50 | | 30.90 | 1.08E+02 | 2.10E+00 | 3.58E+00 |
| | | | 105.30 | | 20.70 | 7.36E-01 | | 2.10E+00 |
| + | @ | EU-156 | 811.77 | | 10.40 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 1153.47 | | 7.20 | 1.00E+26 | | 1.00E+26 |

Analysis Report for 1707087-01

GAS-1402

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| @ | EU-156 | 1230.71 | 8.90 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | HO-166M | 184.41 | 72.60 | 2.80E-02 | 5.04E-01 | 5.04E-01 |
| | | 280.45 | 29.60 | -2.52E-02 | | 1.52E+00 |
| | | 410.94 | 11.10 | -1.32E+00 | | 5.43E+00 |
| | | 711.69 | 54.10 | -5.27E-01 | | 1.46E+00 |
| + | TM-171 | 66.72 | 0.14 | -6.47E+02 | 8.49E+02 | 8.49E+02 |
| + | HF-172 | 67.35 | 5.31 | -1.75E+01 | 8.86E+00 | 2.29E+01 |
| | | 125.81 | 11.30 | -3.88E-01 | | 8.86E+00 |
| + @ | LU-172 | 181.53 | 20.60 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| @ | | 900.72 | 29.81 | 1.00E+26 | | 1.00E+26 |
| @ | | 1093.66 | 62.50 | 1.00E+26 | | 1.00E+26 |
| + | LU-173 | 100.72 | 5.24 | -8.65E+00 | 9.04E+00 | 2.35E+01 |
| | | 272.11 | 21.20 | -2.03E+00 | | 9.04E+00 |
| + | HF-175 | 343.40 | 84.00 | -5.90E+03 | 2.08E+04 | 2.08E+04 |
| + | LU-176 | 88.34 | 13.30 | 1.66E+02 | 4.53E-01 | 5.50E+00 |
| | | 201.83 | 86.00 | -2.16E-01 | | 4.53E-01 |
| | | 306.78 | 94.00 | 1.93E-01 | | 5.05E-01 |
| + | HF-181 | 133.02 | 41.70 | -3.08E+06 | 2.35E+07 | 2.35E+07 |
| | | 345.85 | 17.20 | 4.05E+07 | | 9.39E+07 |
| | | 482.03 | 82.80 | -1.26E+06 | | 2.50E+07 |
| + | TA-182 | 67.75 | 41.20 | 1.28E+03 | 6.13E+02 | 6.13E+02 |
| | | 1121.30 | 34.90 | 8.35E+02 | | 1.82E+03 |
| | | 1189.05 | 16.23 | 6.71E+00 | | 2.84E+03 |
| | | 1221.41 | 26.98 | 2.70E+02 | | 1.46E+03 |
| | | 1231.02 | 11.44 | -1.84E+03 | | 3.07E+03 |
| + | IR-192 | 308.46 | 29.68 | 4.53E+03 | 2.86E+04 | 3.18E+04 |
| | | 468.07 | 48.10 | 6.05E+03 | | 2.86E+04 |
| + | HG-203 | 279.19 | 77.30 | 4.07E+05 | 3.85E+06 | 3.85E+06 |
| + | TL-204 | 374.74 | 94.11 | 4.11E-01 | 9.95E-01 | 9.95E-01 |
| | | 899.15 | 99.16 | -6.46E-01 | | 1.95E+00 |
| | | 911.74 | 91.10 | -5.70E-03 | | 2.20E+00 |
| + | BI-207 | 569.67 | 97.72 | -1.20E-01 | 6.70E-01 | 6.70E-01 |
| | | 1063.62 | 74.90 | 3.89E-01 | | 1.64E+00 |
| + | TL-208 | 583.14 | 30.22 | 9.43E-01 | 9.22E-01 | 2.12E+00 |
| | | 860.37 | 4.48 | 6.99E+00 | | 2.30E+01 |
| | | 2614.66 | 35.85 | 0.00E+00 | | 9.22E-01 |
| + | BI-210M | 262.00 | 45.00 | -1.91E-01 | 9.70E-01 | 9.70E-01 |
| | | 300.00 | 23.00 | -8.48E-01 | | 2.01E+00 |
| + | PB-210 | 46.50 | 4.25 | 1.24E+01 | 2.03E+01 | 2.03E+01 |
| + | PB-211 | 404.84 | 2.90 | 5.31E+00 | 2.05E+01 | 2.05E+01 |
| | | 831.96 | 2.90 | -4.10E+00 | | 3.39E+01 |
| + | BI-212 | 727.17 | 11.80 | -2.14E+00 | 6.95E+00 | 6.95E+00 |
| | | 1620.62 | 2.75 | 1.34E+00 | | 1.06E+01 |
| + | PB-212 | 238.63 | 44.60 | 9.59E-01 | 9.92E-01 | 9.92E-01 |
| | | 300.09 | 3.41 | -5.72E+00 | | 1.36E+01 |
| + | BI-214 | 609.31 | 46.30 | 5.33E-01 | 1.44E+00 | 1.44E+00 |
| | | 1120.29 | 15.10 | 1.88E+00 | | 7.05E+00 |
| | | 1764.49 | 15.80 | 7.79E-01 | | 2.03E+00 |

Analysis Report for 1707087-01

GAS-1402

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | | BI-214 | 2204.22 | | 4.98 | -4.88E+00 | 1.44E+00 | 4.52E+00 |
| + | | PB-214 | 295.21 | | 19.19 | -5.41E-01 | 1.39E+00 | 2.40E+00 |
| | | | 351.92 | | 37.19 | 1.14E-01 | | 1.39E+00 |
| + | | RN-219 | 401.80 | | 6.50 | -2.06E+00 | 9.06E+00 | 9.06E+00 |
| + | | RA-223 | 323.87 | | 3.88 | 1.02E+00 | 1.26E+01 | 1.26E+01 |
| + | | RA-224 | 240.98 | | 3.95 | 3.42E+00 | 1.11E+01 | 1.11E+01 |
| + | @ | RA-225 | 40.00 | | 31.00 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | RA-226 | 186.21 | | 3.28 | 3.71E+00 | 1.14E+01 | 1.14E+01 |
| + | | TH-227 | 50.10 | | 8.40 | 6.06E+01 | 3.84E+00 | 1.00E+01 |
| | | | 236.00 | | 11.50 | 2.09E+00 | | 3.84E+00 |
| | | | 256.20 | | 6.30 | 4.72E-01 | | 6.90E+00 |
| + | | AC-228 | 338.32 | | 11.40 | 2.21E+00 | 4.24E+00 | 4.42E+00 |
| | | | 911.07 | | 27.70 | -8.03E-01 | | 4.24E+00 |
| | | | 969.11 | | 16.60 | 1.58E-01 | | 7.29E+00 |
| + | | TH-230 | 48.44 | | 16.90 | 1.67E+01 | 4.73E+00 | 4.73E+00 |
| | | | 62.85 | | 4.60 | 4.59E+02 | | 2.09E+01 |
| | | | 67.67 | | 0.37 | 2.37E+02 | | 1.14E+02 |
| + | | PA-231 | 283.67 | | 1.60 | 6.80E+00 | 2.05E+01 | 2.83E+01 |
| | | | 302.67 | | 2.30 | 1.74E+01 | | 2.05E+01 |
| + | | TH-231 | 25.64 | | 14.70 | -1.22E+02 | 8.14E+00 | 2.80E+01 |
| | | | 84.21 | | 6.40 | -2.25E+02 | | 8.14E+00 |
| + | | PA-233 | 311.98 | | 38.60 | 8.51E+11 | 7.52E+11 | 7.52E+11 |
| + | | PA-234 | 131.20 | | 20.40 | 1.49E-02 | 1.49E+00 | 1.49E+00 |
| | | | 733.99 | | 8.80 | 6.74E-01 | | 9.44E+00 |
| | | | 946.00 | | 12.00 | 7.30E+00 | | 1.09E+01 |
| + | | PA-234M | 1001.03 | | 0.92 | -6.10E+00 | 1.24E+02 | 1.24E+02 |
| + | | TH-234 | 63.29 | | 3.80 | 5.54E+02 | 2.53E+01 | 2.53E+01 |
| + | | U-235 | 143.76 | | 10.50 | -7.31E-01 | 2.96E+00 | 2.96E+00 |
| | | | 163.35 | | 4.70 | 7.49E-01 | | 7.19E+00 |
| | | | 205.31 | | 4.70 | 7.86E-01 | | 8.42E+00 |
| + | | NP-237 | 86.50 | | 12.60 | 1.77E+02 | 5.87E+00 | 5.87E+00 |
| + | @ | NP-239 | 106.10 | | 22.70 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 228.18 | | 10.70 | 1.00E+26 | | 1.00E+26 |
| | @ | | 277.60 | | 14.10 | 1.00E+26 | | 1.00E+26 |
| + | | AM-241 | 59.54 | * | 35.90 | 2.25E+02 | 3.44E+00 | 3.44E+00 |
| + | | AM-243 | 74.67 | | 66.00 | 1.28E-01 | 6.13E-01 | 6.13E-01 |
| + | | CM-243 | 209.75 | | 3.29 | 2.03E+00 | 3.42E+00 | 1.34E+01 |
| | | | 228.14 | | 10.60 | 2.03E+00 | | 4.41E+00 |
| | | | 277.60 | | 14.00 | -8.40E-02 | | 3.42E+00 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

Analysis Report for 1707087-01

GAS-1402

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 5.76E+06 | 5.76E+06 | 2.10E+06 | 2.85E+06 |
| | NA-22 | 1274.54 | | 99.94 | 1.03E+00 | 1.03E+00 | -1.79E-01 | 4.92E-01 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 2.57E-01 | 2.57E-01 | -8.13E-02 | 1.14E-01 |
| | K-40 | 1460.81 | | 10.67 | 2.98E+00 | 2.98E+00 | -7.80E-01 | 1.38E+00 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 4.59E-01 | 4.27E-01 | 9.59E-01 | 2.28E-01 |
| | | 78.34 | | 96.00 | 4.27E-01 | | -2.94E-02 | 2.12E-01 |
| | SC-46 | 889.25 | | 99.98 | 6.85E+03 | 6.60E+03 | -1.86E+03 | 3.38E+03 |
| | | 1120.51 | | 99.99 | 6.60E+03 | | 1.76E+03 | 3.24E+03 |
| @ | V-48 | 983.52 | | 99.98 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1312.10 | | 97.50 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CR-51 | 320.08 | | 9.83 | 1.46E+12 | 1.46E+12 | 1.51E+11 | 7.20E+11 |
| | MN-54 | 834.83 | | 99.97 | 1.03E+01 | 1.03E+01 | -1.46E-01 | 5.08E+00 |
| | CO-56 | 846.75 | | 99.96 | 1.11E+04 | 7.49E+03 | 3.48E+01 | 5.49E+03 |
| | | 1037.75 | | 14.03 | 8.88E+04 | | 2.37E+04 | 4.37E+04 |
| | | 1238.25 | | 67.00 | 9.45E+03 | | 4.58E+03 | 4.56E+03 |
| | | 1771.40 | | 15.51 | 1.93E+04 | | -1.84E+03 | 8.69E+03 |
| | | 2598.48 | | 16.90 | 7.49E+03 | | 0.00E+00 | 2.37E+03 |
| + | CO-57 | 122.06 | * | 85.51 | 8.19E+00 | 8.19E+00 | 7.17E+01 | 4.07E+00 |
| | | 136.48 | * | 10.60 | 5.55E+01 | | 8.48E+01 | 2.76E+01 |
| | CO-58 | 810.76 | | 99.40 | 2.96E+04 | 2.96E+04 | 1.50E+04 | 1.46E+04 |
| | FE-59 | 1099.22 | | 56.50 | 2.77E+07 | 1.48E+07 | -1.40E+07 | 1.36E+07 |
| | | 1291.56 | | 43.20 | 1.48E+07 | | -1.94E+06 | 7.09E+06 |
| + | CO-60 | 1173.22 | * | 100.00 | 2.27E+00 | 1.20E+00 | 1.24E+02 | 1.12E+00 |
| | | 1332.49 | * | 100.00 | 1.20E+00 | | 1.24E+02 | 5.82E-01 |
| | ZN-65 | 1115.52 | | 50.75 | 4.44E+01 | 4.44E+01 | -4.56E+00 | 2.18E+01 |
| @ | GA-67 | 93.31 | | 35.70 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 208.95 | | 2.24 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 300.22 | | 16.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | SE-75 | 121.11 | | 16.70 | 1.12E+03 | 2.45E+02 | 1.10E+04 | 5.54E+02 |
| | | 136.00 | | 59.20 | 2.45E+02 | | 4.40E+02 | 1.22E+02 |
| | | 264.65 | | 59.80 | 3.33E+02 | | 1.10E+02 | 1.65E+02 |
| | | 279.53 | | 25.20 | 8.01E+02 | | 1.79E+01 | 3.96E+02 |
| | | 400.65 | | 11.40 | 2.34E+03 | | 6.43E+01 | 1.15E+03 |
| | RB-82 | 776.52 | | 13.00 | 1.89E+13 | 1.89E+13 | 5.88E+12 | 9.29E+12 |

Analysis Report for 1707087-01

GAS-1402

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | RB-83 | 520.41 | | 46.00 | 6.74E+03 | 6.74E+03 | 1.38E+03 | 3.32E+03 |
| | | 529.64 | | 30.30 | 1.04E+04 | | 5.09E+03 | 5.14E+03 |
| | | 552.65 | | 16.40 | 1.82E+04 | | -6.11E+03 | 8.94E+03 |
| | KR-85 | 513.99 | | 0.43 | 1.80E+02 | 1.80E+02 | -1.21E+01 | 8.87E+01 |
| | SR-85 | 513.99 | | 99.27 | 5.22E+04 | 5.22E+04 | -3.51E+03 | 2.57E+04 |
| | Y-88 | 898.02 | | 93.40 | 1.16E+03 | 4.16E+02 | -2.30E+02 | 5.71E+02 |
| | | 1836.01 | | 99.38 | 4.16E+02 | | 3.83E+02 | 1.94E+02 |
| | MO-93 | 263.06 | | 56.72 | 9.28E-01 | 3.83E-01 | 6.10E-02 | 4.59E-01 |
| | | 684.67 | | 99.68 | 9.21E-01 | | -4.22E-01 | 4.53E-01 |
| | | 1477.11 | | 99.08 | 3.83E-01 | | 1.01E-01 | 1.77E-01 |
| | NB-93M | 16.57 | | 9.43 | 8.49E+01 | 8.49E+01 | -3.93E+03 | 4.22E+01 |
| | NB-94 | 702.63 | | 100.00 | 7.80E-01 | 7.80E-01 | 6.25E-02 | 3.84E-01 |
| | | 871.10 | | 100.00 | 1.07E+00 | | -5.18E-02 | 5.26E-01 |
| | NB-95 | 765.79 | | 99.81 | 1.04E+09 | 1.04E+09 | 5.53E+08 | 5.11E+08 |
| @ | NB-95M | 235.69 | | 25.00 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | ZR-95 | 724.18 | | 43.70 | 1.72E+05 | 1.43E+05 | -4.60E+04 | 8.48E+04 |
| | | 756.72 | | 55.30 | 1.43E+05 | | -6.12E+04 | 7.06E+04 |
| @ | MO-99 | 181.06 | | 6.20 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 739.58 | | 12.80 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 778.00 | | 4.50 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | RU-103 | 497.08 | | 89.00 | 8.71E+07 | 8.71E+07 | 1.75E+06 | 4.30E+07 |
| | RU-106 | 621.84 | | 9.80 | 5.02E+01 | 5.02E+01 | 2.26E+01 | 2.47E+01 |
| | AG-108M | 433.93 | | 89.90 | 7.27E-01 | 7.27E-01 | -1.69E-01 | 3.59E-01 |
| | | 614.37 | | 90.40 | 7.33E-01 | | -1.25E-01 | 3.60E-01 |
| | | 722.95 | | 90.50 | 9.11E-01 | | -1.97E-01 | 4.49E-01 |
| + | CD-109 | 88.03 | * | 3.72 | 8.28E+01 | 8.28E+01 | 2.88E+03 | 4.13E+01 |
| | AG-110M | 657.75 | | 93.14 | 4.55E+01 | 2.27E+01 | 7.02E+02 | 2.26E+01 |
| | | 677.61 | | 10.53 | 1.34E+02 | | -6.52E+01 | 6.62E+01 |
| | | 706.67 | | 16.46 | 8.96E+01 | | -5.14E+00 | 4.41E+01 |
| | | 763.93 | | 21.98 | 7.49E+01 | | 8.59E+00 | 3.69E+01 |
| | | 884.67 | | 71.63 | 2.85E+01 | | -2.33E+00 | 1.41E+01 |
| | | 1384.27 | | 23.94 | 2.27E+01 | | -9.32E+00 | 1.05E+01 |
| | CD-113M | 263.70 | | 0.02 | 2.21E+03 | 2.21E+03 | 5.93E+02 | 1.10E+03 |
| | SN-113 | 255.12 | | 1.93 | 1.30E+04 | 5.11E+02 | 1.98E+03 | 6.44E+03 |
| | | 391.69 | | 64.90 | 5.11E+02 | | -1.95E+02 | 2.52E+02 |
| | TE123M | 159.00 | | 84.10 | 1.74E+02 | 1.74E+02 | 3.55E+01 | 8.63E+01 |
| | SB-124 | 602.71 | | 97.87 | 1.29E+05 | 1.15E+05 | -5.26E+03 | 6.35E+04 |
| | | 645.85 | | 7.26 | 1.80E+06 | | -4.44E+05 | 8.87E+05 |
| | | 722.78 | | 11.10 | 1.40E+06 | | -3.02E+05 | 6.88E+05 |
| | | 1691.02 | | 49.00 | 1.15E+05 | | 2.45E+04 | 5.26E+04 |
| | I-125 | 35.49 | | 6.49 | 2.16E+06 | 2.16E+06 | -9.68E+05 | 1.07E+06 |
| | SB-125 | 176.33 | | 6.89 | 1.05E+01 | 4.37E+00 | 8.95E+00 | 5.19E+00 |
| | | 427.89 | | 29.33 | 4.37E+00 | | -3.28E+00 | 2.16E+00 |
| | | 463.38 | | 10.35 | 1.38E+01 | | -4.78E+00 | 6.82E+00 |
| | | 600.56 | | 17.80 | 7.57E+00 | | -2.43E+00 | 3.72E+00 |
| | | 635.90 | | 11.32 | 1.25E+01 | | 6.69E+00 | 6.15E+00 |
| @ | SB-126 | 414.70 | | 83.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 666.33 | | 99.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 695.00 | | 99.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 720.50 | | 53.80 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| + | SN-126 | 87.57 | * | 37.00 | 1.72E+00 | 1.72E+00 | 5.98E+01 | 8.56E-01 |
| @ | SB-127 | 473.00 | | 25.00 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 685.20 | | 35.70 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |

Analysis Report for 1707087-01

GAS-1402

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| @ | SB-127 | 783.80 | | 14.70 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | I-129 | 29.78 | | 57.00 | 1.99E+00 | 1.99E+00 | -2.22E+01 | 9.90E-01 |
| | | 33.60 | | 13.20 | 6.44E+00 | | 3.04E+00 | 3.20E+00 |
| | | 39.58 | | 7.52 | 8.61E+00 | | -2.48E+01 | 4.28E+00 |
| @ | I-131 | 284.30 | | 6.05 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 364.48 | | 81.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 636.97 | | 7.26 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 722.89 | | 1.80 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | TE-132 | 49.72 | | 13.10 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 228.16 | | 88.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | BA-133 | 81.00 | | 33.00 | 1.46E+00 | 1.06E+00 | -5.57E-01 | 7.26E-01 |
| | | 302.84 | | 17.80 | 3.21E+00 | | 2.72E+00 | 1.59E+00 |
| | | 356.01 | | 60.00 | 1.06E+00 | | 3.52E-01 | 5.23E-01 |
| @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | XE-133 | 81.00 | | 38.00 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | CS-134 | 563.23 | | 8.38 | 1.98E+01 | 1.81E+00 | -8.14E+00 | 9.72E+00 |
| | | 569.32 | | 15.43 | 1.06E+01 | | -1.88E+00 | 5.19E+00 |
| | | 604.70 | | 97.60 | 1.81E+00 | | 3.64E-01 | 8.91E-01 |
| | | 795.84 | | 85.40 | 2.83E+00 | | -3.39E-01 | 1.40E+00 |
| | | 801.93 | | 8.73 | 2.79E+01 | | -1.10E+00 | 1.38E+01 |
| | CS-135 | 268.24 | | 16.00 | 2.77E+00 | 2.77E+00 | 1.23E+00 | 1.37E+00 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | CS-136 | 153.22 | | 7.46 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 163.89 | | 4.61 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 176.55 | | 13.56 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 273.65 | | 12.66 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 340.57 | | 48.50 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 818.50 | | 99.70 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1048.07 | | 79.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1235.34 | | 19.70 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| + | CS-137 | 661.65 | * | 85.12 | 1.81E+00 | 1.81E+00 | 8.05E+01 | 9.00E-01 |
| | LA-138 | 788.74 | | 34.00 | 2.67E+00 | 4.28E-01 | -3.15E-02 | 1.32E+00 |
| | | 1435.80 | | 66.00 | 4.28E-01 | | -7.29E-02 | 1.97E-01 |
| + | CE-139 | 165.85 | * | 80.35 | 9.73E+01 | 9.73E+01 | 1.08E+02 | 4.83E+01 |
| @ | BA-140 | 162.64 | | 6.70 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 304.84 | | 4.50 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 423.70 | | 3.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 437.55 | | 2.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 537.32 | | 25.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | LA-140 | 328.77 | | 20.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 487.03 | | 45.50 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 815.85 | | 23.50 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1596.49 | | 95.49 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-141 | 145.44 | | 48.40 | 3.92E+09 | 3.92E+09 | 1.65E+09 | 1.94E+09 |
| @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-144 | 133.54 | | 10.80 | 3.84E+01 | 3.84E+01 | -9.77E+00 | 1.90E+01 |
| | PM-144 | 476.78 | | 42.00 | 1.23E+01 | 5.06E+00 | 1.31E+01 | 6.08E+00 |
| | | 618.01 | | 98.60 | 5.06E+00 | | -6.08E-01 | 2.49E+00 |
| | | 696.49 | | 99.49 | 5.79E+00 | | -9.92E-01 | 2.85E+00 |

Analysis Report for 1707087-01

GAS-1402

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| PM-145 | 36.85 | 21.70 | 3.44E+00 | 1.84E+00 | -3.80E+00 | 1.71E+00 |
| | 37.36 | 39.70 | 1.84E+00 | | -2.03E+00 | 9.13E-01 |
| | 42.30 | 15.10 | 4.72E+00 | | -8.61E+00 | 2.35E+00 |
| | 72.40 | 2.31 | 2.00E+01 | | -1.85E+00 | 9.92E+00 |
| PM-146 | 453.90 | 39.94 | 2.53E+00 | 2.53E+00 | 9.44E-01 | 1.25E+00 |
| | 735.90 | 14.01 | 8.47E+00 | | -1.67E+00 | 4.17E+00 |
| | 747.13 | 13.10 | 9.40E+00 | | 3.77E+00 | 4.63E+00 |
| @ ND-147 | 91.11 | 28.90 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 531.02 | 13.10 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ PM-149 | 285.90 | 3.10 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| EU-152 | 121.78 | 20.50 | 2.33E+00 | 2.33E+00 | 2.30E+01 | 1.16E+00 |
| | 244.69 | 5.40 | 9.20E+00 | | -3.51E+00 | 4.56E+00 |
| | 344.27 | 19.13 | 3.05E+00 | | -8.65E-01 | 1.51E+00 |
| | 778.89 | 9.20 | 1.10E+01 | | -1.58E+00 | 5.44E+00 |
| | 964.01 | 10.40 | 1.41E+01 | | 7.95E+00 | 6.94E+00 |
| | 1085.78 | 7.22 | 1.95E+01 | | -6.64E+00 | 9.60E+00 |
| | 1112.02 | 9.60 | 1.44E+01 | | 6.28E+00 | 7.09E+00 |
| | 1407.95 | 14.94 | 2.37E+00 | | -3.85E-01 | 1.10E+00 |
| GD-153 | 97.43 | 31.30 | 1.88E+01 | 1.88E+01 | 3.18E-01 | 9.34E+00 |
| | 103.18 | 22.20 | 2.68E+01 | | 2.19E+00 | 1.33E+01 |
| EU-154 | 123.07 | 40.50 | 1.28E+00 | 1.28E+00 | 1.22E+01 | 6.36E-01 |
| | 723.30 | 19.70 | 5.18E+00 | | -1.38E+00 | 2.55E+00 |
| | 873.19 | 11.50 | 1.17E+01 | | 1.07E+00 | 5.79E+00 |
| | 996.32 | 10.30 | 1.39E+01 | | 7.09E+00 | 6.86E+00 |
| | 1004.76 | 17.90 | 8.08E+00 | | -2.19E+00 | 3.98E+00 |
| | 1274.45 | 35.50 | 1.68E+00 | | -2.92E-01 | 8.06E-01 |
| EU-155 | 86.50 | 30.90 | 3.58E+00 | 2.10E+00 | 1.08E+02 | 1.79E+00 |
| | 105.30 | 20.70 | 2.10E+00 | | 7.36E-01 | 1.04E+00 |
| @ EU-156 | 811.77 | 10.40 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 1153.47 | 7.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1230.71 | 8.90 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| HO-166M | 184.41 | 72.60 | 5.04E-01 | 5.04E-01 | 2.80E-02 | 2.50E-01 |
| | 280.45 | 29.60 | 1.52E+00 | | -2.52E-02 | 7.51E-01 |
| | 410.94 | 11.10 | 5.43E+00 | | -1.32E+00 | 2.68E+00 |
| | 711.69 | 54.10 | 1.46E+00 | | -5.27E-01 | 7.19E-01 |
| TM-171 | 66.72 | 0.14 | 8.49E+02 | 8.49E+02 | -6.47E+02 | 4.22E+02 |
| HF-172 | 67.35 | 5.31 | 2.29E+01 | 8.86E+00 | -1.75E+01 | 1.14E+01 |
| | 125.81 | 11.30 | 8.86E+00 | | -3.88E-01 | 4.40E+00 |
| @ LU-172 | 181.53 | 20.60 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 900.72 | 29.81 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1093.66 | 62.50 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| LU-173 | 100.72 | 5.24 | 2.35E+01 | 9.04E+00 | -8.65E+00 | 1.16E+01 |
| | 272.11 | 21.20 | 9.04E+00 | | -2.03E+00 | 4.47E+00 |
| HF-175 | 343.40 | 84.00 | 2.08E+04 | 2.08E+04 | -5.90E+03 | 1.03E+04 |
| LU-176 | 88.34 | 13.30 | 5.50E+00 | 4.53E-01 | 1.66E+02 | 2.74E+00 |
| | 201.83 | 86.00 | 4.53E-01 | | -2.16E-01 | 2.25E-01 |
| | 306.78 | 94.00 | 5.05E-01 | | 1.93E-01 | 2.50E-01 |
| HF-181 | 133.02 | 41.70 | 2.35E+07 | 2.35E+07 | -3.08E+06 | 1.17E+07 |
| | 345.85 | 17.20 | 9.39E+07 | | 4.05E+07 | 4.64E+07 |
| | 482.03 | 82.80 | 2.50E+07 | | -1.26E+06 | 1.23E+07 |
| TA-182 | 67.75 | 41.20 | 6.13E+02 | 6.13E+02 | 1.28E+03 | 3.05E+02 |
| | 1121.30 | 34.90 | 1.82E+03 | | 8.35E+02 | 8.95E+02 |
| | 1189.05 | 16.23 | 2.84E+03 | | 6.71E+00 | 1.39E+03 |

Analysis Report for 1707087-01

GAS-1402

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| TA-182 | 1221.41 | 26.98 | 1.46E+03 | 6.13E+02 | 2.70E+02 | 7.07E+02 |
| | 1231.02 | 11.44 | 3.07E+03 | | -1.84E+03 | 1.49E+03 |
| IR-192 | 308.46 | 29.68 | 3.18E+04 | 2.86E+04 | 4.53E+03 | 1.57E+04 |
| | 468.07 | 48.10 | 2.86E+04 | | 6.05E+03 | 1.41E+04 |
| HG-203 | 279.19 | 77.30 | 3.85E+06 | 3.85E+06 | 4.07E+05 | 1.91E+06 |
| TL-204 | 374.74 | 94.11 | 9.95E-01 | 9.95E-01 | 4.11E-01 | 4.92E-01 |
| | 899.15 | 99.16 | 1.95E+00 | | -6.46E-01 | 9.61E-01 |
| | 911.74 | 91.10 | 2.20E+00 | | -5.70E-03 | 1.09E+00 |
| BI-207 | 569.67 | 97.72 | 6.70E-01 | 6.70E-01 | -1.20E-01 | 3.30E-01 |
| | 1063.62 | 74.90 | 1.64E+00 | | 3.89E-01 | 8.07E-01 |
| TL-208 | 583.14 | 30.22 | 2.12E+00 | 9.22E-01 | 9.43E-01 | 1.04E+00 |
| | 860.37 | 4.48 | 2.30E+01 | | 6.99E+00 | 1.13E+01 |
| | 2614.66 | 35.85 | 9.22E-01 | | 0.00E+00 | 4.01E-01 |
| BI-210M | 262.00 | 45.00 | 9.70E-01 | 9.70E-01 | -1.91E-01 | 4.80E-01 |
| | 300.00 | 23.00 | 2.01E+00 | | -8.48E-01 | 9.93E-01 |
| PB-210 | 46.50 | 4.25 | 2.03E+01 | 2.03E+01 | 1.24E+01 | 1.01E+01 |
| PB-211 | 404.84 | 2.90 | 2.05E+01 | 2.05E+01 | 5.31E+00 | 1.01E+01 |
| | 831.96 | 2.90 | 3.39E+01 | | -4.10E+00 | 1.67E+01 |
| BI-212 | 727.17 | 11.80 | 6.95E+00 | 6.95E+00 | -2.14E+00 | 3.42E+00 |
| | 1620.62 | 2.75 | 1.06E+01 | | 1.34E+00 | 4.84E+00 |
| PB-212 | 238.63 | 44.60 | 9.92E-01 | 9.92E-01 | 9.59E-01 | 4.92E-01 |
| | 300.09 | 3.41 | 1.36E+01 | | -5.72E+00 | 6.70E+00 |
| BI-214 | 609.31 | 46.30 | 1.44E+00 | 1.44E+00 | 5.33E-01 | 7.08E-01 |
| | 1120.29 | 15.10 | 7.05E+00 | | 1.88E+00 | 3.47E+00 |
| | 1764.49 | 15.80 | 2.03E+00 | | 7.79E-01 | 9.28E-01 |
| | 2204.22 | 4.98 | 4.52E+00 | | -4.88E+00 | 1.91E+00 |
| PB-214 | 295.21 | 19.19 | 2.40E+00 | 1.39E+00 | -5.41E-01 | 1.19E+00 |
| | 351.92 | 37.19 | 1.39E+00 | | 1.14E-01 | 6.88E-01 |
| RN-219 | 401.80 | 6.50 | 9.06E+00 | 9.06E+00 | -2.06E+00 | 4.48E+00 |
| RA-223 | 323.87 | 3.88 | 1.26E+01 | 1.26E+01 | 1.02E+00 | 6.22E+00 |
| RA-224 | 240.98 | 3.95 | 1.11E+01 | 1.11E+01 | 3.42E+00 | 5.50E+00 |
| @ RA-225 | 40.00 | 31.00 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| RA-226 | 186.21 | 3.28 | 1.14E+01 | 1.14E+01 | 3.71E+00 | 5.64E+00 |
| TH-227 | 50.10 | 8.40 | 1.00E+01 | 3.84E+00 | 6.06E+01 | 4.99E+00 |
| | 236.00 | 11.50 | 3.84E+00 | | 2.09E+00 | 1.90E+00 |
| | 256.20 | 6.30 | 6.90E+00 | | 4.72E-01 | 3.41E+00 |
| AC-228 | 338.32 | 11.40 | 4.42E+00 | 4.24E+00 | 2.21E+00 | 2.19E+00 |
| | 911.07 | 27.70 | 4.24E+00 | | -8.03E-01 | 2.09E+00 |
| | 969.11 | 16.60 | 7.29E+00 | | 1.58E-01 | 3.59E+00 |
| TH-230 | 48.44 | 16.90 | 4.73E+00 | 4.73E+00 | 1.67E+01 | 2.36E+00 |
| | 62.85 | 4.60 | 2.09E+01 | | 4.59E+02 | 1.04E+01 |
| | 67.67 | 0.37 | 1.14E+02 | | 2.37E+02 | 5.65E+01 |
| PA-231 | 283.67 | 1.60 | 2.83E+01 | 2.05E+01 | 6.80E+00 | 1.40E+01 |
| | 302.67 | 2.30 | 2.05E+01 | | 1.74E+01 | 1.01E+01 |
| TH-231 | 25.64 | 14.70 | 2.80E+01 | 8.14E+00 | -1.22E+02 | 1.40E+01 |
| | 84.21 | 6.40 | 8.14E+00 | | -2.25E+02 | 4.05E+00 |
| PA-233 | 311.98 | 38.60 | 7.52E+11 | 7.52E+11 | 8.51E+11 | 3.72E+11 |
| PA-234 | 131.20 | 20.40 | 1.49E+00 | 1.49E+00 | 1.49E-02 | 7.38E-01 |
| | 733.99 | 8.80 | 9.44E+00 | | 6.74E-01 | 4.65E+00 |
| | 946.00 | 12.00 | 1.09E+01 | | 7.30E+00 | 5.40E+00 |
| PA-234M | 1001.03 | 0.92 | 1.24E+02 | 1.24E+02 | -6.10E+00 | 6.10E+01 |
| TH-234 | 63.29 | 3.80 | 2.53E+01 | 2.53E+01 | 5.54E+02 | 1.26E+01 |
| U-235 | 143.76 | 10.50 | 2.96E+00 | 2.96E+00 | -7.31E-01 | 1.47E+00 |

Analysis Report for 1707087-01

GAS-1402

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | U-235 | 163.35 | | 4.70 | 7.19E+00 | 2.96E+00 | 7.49E-01 | 3.57E+00 |
| | | 205.31 | | 4.70 | 8.42E+00 | | 7.86E-01 | 4.17E+00 |
| | NP-237 | 86.50 | | 12.60 | 5.87E+00 | 5.87E+00 | 1.77E+02 | 2.93E+00 |
| @ | NP-239 | 106.10 | | 22.70 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 228.18 | | 10.70 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 277.60 | | 14.10 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| + | AM-241 | 59.54 | * | 35.90 | 3.44E+00 | 3.44E+00 | 2.25E+02 | 1.72E+00 |
| | AM-243 | 74.67 | | 66.00 | 6.13E-01 | 6.13E-01 | 1.28E-01 | 3.05E-01 |
| | CM-243 | 209.75 | | 3.29 | 1.34E+01 | 3.42E+00 | 2.03E+00 | 6.64E+00 |
| | | 228.14 | | 10.60 | 4.41E+00 | | 2.03E+00 | 2.19E+00 |
| | | 277.60 | | 14.00 | 3.42E+00 | | -8.40E-02 | 1.69E+00 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: GAS-1402

Elapsed Live time: 1800
Elapsed Real Time: 1834

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 3 | 461 | 1924 |
| 17: | 1998 | 1980 | 5574 | 22532 | 37703 | 23095 | 11162 | 11957 |
| 25: | 6973 | 2065 | 876 | 766 | 819 | 1237 | 1564 | 1320 |
| 33: | 917 | 809 | 1001 | 1049 | 923 | 974 | 1080 | 1177 |
| 41: | 1311 | 1515 | 1656 | 1721 | 1898 | 2320 | 2965 | 3719 |
| 49: | 4278 | 4022 | 3816 | 3760 | 3656 | 4105 | 4169 | 4949 |
| 57: | 11929 | 30438 | 30365 | 10245 | 1758 | 1043 | 1155 | 1191 |
| 65: | 1386 | 1359 | 1480 | 1469 | 1369 | 1396 | 1380 | 1326 |
| 73: | 1407 | 1401 | 1394 | 1395 | 1274 | 1316 | 1331 | 1353 |
| 81: | 1348 | 1494 | 1508 | 1524 | 2355 | 7069 | 12089 | 7463 |
| 89: | 1779 | 813 | 766 | 748 | 733 | 694 | 694 | 698 |
| 97: | 717 | 672 | 698 | 661 | 655 | 741 | 715 | 749 |
| 105: | 697 | 698 | 705 | 708 | 695 | 730 | 697 | 696 |
| 113: | 714 | 758 | 699 | 676 | 709 | 757 | 868 | 1545 |
| 121: | 2536 | 1876 | 895 | 661 | 683 | 645 | 677 | 674 |
| 129: | 699 | 641 | 597 | 636 | 669 | 673 | 813 | 843 |
| 137: | 704 | 628 | 641 | 617 | 650 | 622 | 624 | 606 |
| 145: | 608 | 632 | 635 | 631 | 607 | 556 | 595 | 616 |
| 153: | 575 | 592 | 598 | 580 | 583 | 591 | 624 | 592 |
| 161: | 562 | 554 | 605 | 717 | 700 | 659 | 591 | 566 |
| 169: | 600 | 560 | 597 | 587 | 573 | 637 | 594 | 547 |
| 177: | 588 | 631 | 532 | 549 | 542 | 570 | 607 | 668 |
| 185: | 609 | 634 | 606 | 639 | 664 | 636 | 613 | 622 |
| 193: | 606 | 646 | 612 | 611 | 621 | 642 | 581 | 573 |
| 201: | 601 | 571 | 569 | 605 | 606 | 613 | 576 | 593 |
| 209: | 598 | 685 | 613 | 627 | 614 | 607 | 654 | 623 |
| 217: | 623 | 687 | 636 | 621 | 642 | 618 | 578 | 557 |
| 225: | 623 | 647 | 618 | 584 | 558 | 569 | 544 | 568 |
| 233: | 551 | 554 | 579 | 560 | 601 | 591 | 540 | 546 |
| 241: | 524 | 499 | 502 | 475 | 532 | 496 | 496 | 483 |
| 249: | 518 | 510 | 472 | 484 | 515 | 422 | 483 | 493 |
| 257: | 459 | 452 | 421 | 488 | 464 | 467 | 433 | 473 |
| 265: | 454 | 457 | 451 | 476 | 398 | 442 | 415 | 428 |
| 273: | 459 | 448 | 444 | 414 | 417 | 396 | 451 | 417 |
| 281: | 430 | 425 | 410 | 445 | 409 | 393 | 418 | 381 |
| 289: | 385 | 440 | 400 | 421 | 401 | 429 | 400 | 377 |
| 297: | 375 | 391 | 420 | 404 | 388 | 375 | 410 | 385 |
| 305: | 409 | 367 | 349 | 375 | 459 | 403 | 403 | 395 |
| 313: | 385 | 380 | 369 | 353 | 383 | 339 | 355 | 385 |
| 321: | 366 | 382 | 374 | 333 | 395 | 370 | 379 | 393 |
| 329: | 379 | 383 | 395 | 347 | 387 | 360 | 384 | 391 |
| 337: | 317 | 365 | 392 | 333 | 343 | 319 | 327 | 356 |
| 345: | 398 | 374 | 379 | 336 | 359 | 328 | 335 | 398 |
| 353: | 339 | 367 | 356 | 337 | 330 | 345 | 367 | 332 |
| 361: | 326 | 362 | 333 | 389 | 366 | 326 | 350 | 354 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 316 | 370 | 341 | 308 | 348 | 400 | 371 | 322 |

Sample Title: GAS-1402

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 366 | 314 | 351 | 341 | 373 | 354 | 335 | 334 |
| 385: | 349 | 351 | 355 | 362 | 354 | 334 | 326 | 385 |
| 393: | 354 | 308 | 353 | 373 | 352 | 352 | 338 | 372 |
| 401: | 358 | 347 | 334 | 325 | 354 | 342 | 380 | 330 |
| 409: | 327 | 351 | 332 | 340 | 356 | 349 | 365 | 360 |
| 417: | 363 | 329 | 359 | 343 | 334 | 345 | 357 | 341 |
| 425: | 374 | 363 | 302 | 320 | 375 | 305 | 374 | 375 |
| 433: | 332 | 377 | 352 | 358 | 377 | 366 | 360 | 375 |
| 441: | 356 | 365 | 383 | 380 | 351 | 344 | 364 | 339 |
| 449: | 380 | 358 | 410 | 380 | 361 | 396 | 384 | 400 |
| 457: | 362 | 398 | 387 | 345 | 376 | 339 | 372 | 364 |
| 465: | 344 | 362 | 365 | 338 | 374 | 341 | 334 | 352 |
| 473: | 360 | 336 | 339 | 335 | 348 | 302 | 307 | 267 |
| 481: | 265 | 283 | 320 | 309 | 284 | 295 | 290 | 260 |
| 489: | 259 | 261 | 273 | 258 | 278 | 278 | 264 | 241 |
| 497: | 273 | 254 | 290 | 297 | 244 | 252 | 238 | 265 |
| 505: | 278 | 242 | 267 | 228 | 271 | 277 | 272 | 248 |
| 513: | 252 | 254 | 209 | 252 | 274 | 240 | 228 | 236 |
| 521: | 219 | 228 | 232 | 234 | 229 | 270 | 229 | 228 |
| 529: | 219 | 226 | 248 | 244 | 232 | 206 | 243 | 218 |
| 537: | 224 | 225 | 224 | 203 | 220 | 231 | 228 | 223 |
| 545: | 199 | 193 | 208 | 201 | 184 | 219 | 186 | 194 |
| 553: | 174 | 204 | 192 | 196 | 203 | 229 | 180 | 184 |
| 561: | 221 | 204 | 202 | 205 | 174 | 174 | 223 | 202 |
| 569: | 190 | 161 | 171 | 176 | 211 | 187 | 204 | 198 |
| 577: | 163 | 191 | 195 | 180 | 193 | 211 | 193 | 189 |
| 585: | 179 | 192 | 174 | 167 | 189 | 179 | 170 | 189 |
| 593: | 182 | 193 | 199 | 193 | 185 | 183 | 203 | 171 |
| 601: | 217 | 185 | 169 | 175 | 215 | 191 | 204 | 193 |
| 609: | 187 | 193 | 178 | 179 | 166 | 173 | 188 | 177 |
| 617: | 189 | 177 | 177 | 201 | 192 | 201 | 179 | 177 |
| 625: | 179 | 160 | 190 | 180 | 192 | 187 | 171 | 201 |
| 633: | 169 | 172 | 190 | 211 | 172 | 181 | 152 | 182 |
| 641: | 170 | 181 | 175 | 176 | 182 | 189 | 183 | 165 |
| 649: | 191 | 191 | 163 | 190 | 184 | 190 | 188 | 195 |
| 657: | 213 | 351 | 1505 | 4653 | 5999 | 3060 | 683 | 178 |
| 665: | 163 | 160 | 167 | 147 | 144 | 177 | 165 | 148 |
| 673: | 149 | 146 | 154 | 150 | 175 | 170 | 167 | 139 |
| 681: | 143 | 156 | 185 | 150 | 157 | 152 | 169 | 145 |
| 689: | 152 | 169 | 135 | 153 | 143 | 151 | 152 | 144 |
| 697: | 153 | 155 | 146 | 161 | 154 | 158 | 152 | 142 |
| 705: | 143 | 172 | 145 | 165 | 167 | 151 | 157 | 153 |
| 713: | 157 | 155 | 132 | 168 | 158 | 158 | 149 | 164 |
| 721: | 175 | 140 | 165 | 166 | 154 | 150 | 159 | 164 |
| 729: | 171 | 167 | 160 | 165 | 161 | 149 | 169 | 151 |
| 737: | 153 | 155 | 160 | 161 | 152 | 137 | 150 | 160 |
| 745: | 185 | 180 | 169 | 165 | 180 | 163 | 152 | 164 |
| 753: | 162 | 155 | 163 | 163 | 167 | 162 | 141 | 176 |
| 761: | 198 | 162 | 159 | 181 | 146 | 162 | 179 | 174 |
| 769: | 156 | 169 | 145 | 162 | 185 | 156 | 155 | 175 |
| 777: | 153 | 155 | 180 | 151 | 147 | 168 | 179 | 206 |
| 785: | 184 | 165 | 152 | 163 | 171 | 157 | 162 | 157 |
| 793: | 169 | 161 | 178 | 195 | 146 | 169 | 174 | 181 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 170 | 174 | 170 | 159 | 172 | 156 | 154 | 160 |

Sample Title: GAS-1402

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 184 | 183 | 169 | 199 | 186 | 191 | 154 | 176 |
| 817: | 172 | 172 | 172 | 190 | 182 | 182 | 166 | 187 |
| 825: | 195 | 167 | 161 | 169 | 178 | 164 | 184 | 203 |
| 833: | 193 | 185 | 174 | 182 | 182 | 160 | 176 | 198 |
| 841: | 151 | 183 | 178 | 175 | 176 | 175 | 193 | 226 |
| 849: | 186 | 194 | 199 | 197 | 184 | 184 | 162 | 182 |
| 857: | 189 | 207 | 167 | 174 | 182 | 189 | 183 | 190 |
| 865: | 185 | 180 | 197 | 189 | 203 | 183 | 196 | 186 |
| 873: | 212 | 201 | 181 | 222 | 181 | 186 | 204 | 179 |
| 881: | 192 | 173 | 220 | 206 | 184 | 203 | 198 | 218 |
| 889: | 203 | 201 | 178 | 213 | 205 | 207 | 195 | 220 |
| 897: | 229 | 196 | 195 | 207 | 189 | 217 | 223 | 223 |
| 905: | 223 | 207 | 226 | 233 | 204 | 203 | 216 | 237 |
| 913: | 222 | 202 | 229 | 210 | 235 | 224 | 222 | 223 |
| 921: | 236 | 240 | 238 | 224 | 251 | 267 | 216 | 218 |
| 929: | 209 | 245 | 243 | 228 | 266 | 244 | 232 | 257 |
| 937: | 250 | 222 | 243 | 222 | 237 | 283 | 260 | 252 |
| 945: | 255 | 243 | 263 | 240 | 250 | 233 | 248 | 264 |
| 953: | 245 | 258 | 262 | 274 | 244 | 217 | 235 | 232 |
| 961: | 264 | 227 | 232 | 216 | 205 | 214 | 216 | 204 |
| 969: | 197 | 186 | 219 | 198 | 183 | 191 | 202 | 188 |
| 977: | 184 | 214 | 195 | 208 | 192 | 177 | 166 | 201 |
| 985: | 165 | 167 | 163 | 179 | 179 | 172 | 152 | 170 |
| 993: | 189 | 154 | 201 | 184 | 177 | 158 | 162 | 176 |
| 1001: | 157 | 174 | 179 | 184 | 178 | 162 | 199 | 164 |
| 1009: | 197 | 197 | 160 | 159 | 164 | 190 | 158 | 190 |
| 1017: | 170 | 173 | 176 | 202 | 177 | 177 | 187 | 185 |
| 1025: | 148 | 160 | 183 | 204 | 165 | 155 | 152 | 175 |
| 1033: | 144 | 173 | 165 | 163 | 147 | 180 | 161 | 163 |
| 1041: | 172 | 156 | 150 | 132 | 154 | 127 | 149 | 164 |
| 1049: | 168 | 151 | 169 | 161 | 180 | 166 | 151 | 149 |
| 1057: | 151 | 155 | 182 | 153 | 138 | 155 | 172 | 156 |
| 1065: | 154 | 164 | 158 | 162 | 149 | 169 | 140 | 170 |
| 1073: | 169 | 148 | 161 | 181 | 174 | 187 | 177 | 167 |
| 1081: | 167 | 162 | 172 | 182 | 170 | 166 | 152 | 173 |
| 1089: | 181 | 183 | 177 | 156 | 158 | 157 | 166 | 154 |
| 1097: | 148 | 144 | 163 | 150 | 144 | 164 | 167 | 165 |
| 1105: | 179 | 163 | 181 | 180 | 154 | 165 | 148 | 177 |
| 1113: | 139 | 143 | 122 | 129 | 137 | 133 | 121 | 123 |
| 1121: | 119 | 124 | 112 | 104 | 117 | 103 | 96 | 100 |
| 1129: | 91 | 113 | 110 | 93 | 111 | 101 | 120 | 79 |
| 1137: | 91 | 97 | 87 | 89 | 104 | 82 | 105 | 104 |
| 1145: | 93 | 96 | 101 | 95 | 86 | 91 | 82 | 80 |
| 1153: | 89 | 101 | 90 | 98 | 80 | 87 | 92 | 96 |
| 1161: | 84 | 98 | 81 | 80 | 99 | 86 | 85 | 83 |
| 1169: | 158 | 453 | 1910 | 4052 | 3958 | 1693 | 343 | 76 |
| 1177: | 66 | 66 | 67 | 59 | 55 | 60 | 64 | 63 |
| 1185: | 58 | 47 | 58 | 62 | 62 | 55 | 67 | 59 |
| 1193: | 43 | 55 | 53 | 49 | 54 | 48 | 53 | 39 |
| 1201: | 44 | 53 | 55 | 61 | 65 | 52 | 38 | 47 |
| 1209: | 54 | 39 | 45 | 41 | 43 | 22 | 47 | 34 |
| 1217: | 48 | 42 | 42 | 36 | 35 | 36 | 36 | 50 |
| 1225: | 25 | 37 | 47 | 33 | 30 | 24 | 24 | 35 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 28 | 27 | 26 | 34 | 28 | 42 | 34 | 24 |

Sample Title: GAS-1402

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 28 | 24 | 24 | 28 | 16 | 22 | 14 | 25 |
| 1249: | 21 | 21 | 25 | 18 | 16 | 29 | 26 | 21 |
| 1257: | 26 | 26 | 22 | 35 | 27 | 16 | 16 | 20 |
| 1265: | 30 | 23 | 20 | 21 | 20 | 24 | 21 | 16 |
| 1273: | 10 | 22 | 19 | 17 | 19 | 19 | 20 | 20 |
| 1281: | 18 | 23 | 18 | 23 | 28 | 15 | 20 | 15 |
| 1289: | 25 | 29 | 16 | 16 | 12 | 14 | 20 | 28 |
| 1297: | 12 | 13 | 18 | 25 | 16 | 14 | 14 | 29 |
| 1305: | 13 | 20 | 18 | 23 | 19 | 12 | 12 | 29 |
| 1313: | 19 | 25 | 27 | 17 | 19 | 17 | 24 | 24 |
| 1321: | 21 | 12 | 19 | 20 | 18 | 25 | 18 | 41 |
| 1329: | 236 | 1220 | 3068 | 3732 | 2026 | 516 | 66 | 9 |
| 1337: | 14 | 11 | 11 | 15 | 7 | 10 | 10 | 10 |
| 1345: | 8 | 8 | 6 | 8 | 5 | 9 | 13 | 9 |
| 1353: | 6 | 11 | 8 | 7 | 5 | 9 | 9 | 6 |
| 1361: | 7 | 9 | 9 | 10 | 8 | 9 | 11 | 2 |
| 1369: | 6 | 4 | 5 | 13 | 7 | 5 | 8 | 6 |
| 1377: | 12 | 7 | 7 | 4 | 6 | 2 | 5 | 6 |
| 1385: | 6 | 6 | 8 | 7 | 7 | 6 | 4 | 7 |
| 1393: | 12 | 5 | 4 | 9 | 8 | 5 | 4 | 10 |
| 1401: | 11 | 5 | 4 | 4 | 8 | 8 | 7 | 6 |
| 1409: | 4 | 6 | 4 | 7 | 8 | 6 | 6 | 3 |
| 1417: | 6 | 7 | 5 | 3 | 3 | 7 | 7 | 5 |
| 1425: | 5 | 0 | 8 | 6 | 3 | 11 | 3 | 3 |
| 1433: | 4 | 6 | 5 | 4 | 6 | 7 | 6 | 5 |
| 1441: | 6 | 2 | 3 | 5 | 8 | 8 | 3 | 3 |
| 1449: | 10 | 7 | 1 | 7 | 6 | 8 | 10 | 3 |
| 1457: | 4 | 6 | 8 | 5 | 6 | 5 | 9 | 9 |
| 1465: | 9 | 7 | 3 | 10 | 5 | 4 | 5 | 6 |
| 1473: | 7 | 4 | 7 | 4 | 7 | 4 | 6 | 4 |
| 1481: | 10 | 3 | 7 | 4 | 3 | 4 | 12 | 5 |
| 1489: | 3 | 6 | 2 | 3 | 6 | 7 | 9 | 3 |
| 1497: | 6 | 4 | 6 | 6 | 5 | 3 | 1 | 6 |
| 1505: | 3 | 6 | 4 | 7 | 6 | 4 | 7 | 6 |
| 1513: | 1 | 4 | 6 | 3 | 2 | 5 | 5 | 6 |
| 1521: | 4 | 2 | 8 | 5 | 6 | 6 | 5 | 7 |
| 1529: | 9 | 6 | 2 | 3 | 4 | 4 | 4 | 7 |
| 1537: | 4 | 4 | 3 | 4 | 2 | 4 | 4 | 3 |
| 1545: | 4 | 6 | 3 | 5 | 7 | 2 | 6 | 2 |
| 1553: | 2 | 6 | 7 | 4 | 5 | 9 | 6 | 6 |
| 1561: | 4 | 4 | 3 | 1 | 6 | 4 | 6 | 5 |
| 1569: | 5 | 2 | 5 | 2 | 3 | 3 | 5 | 5 |
| 1577: | 5 | 1 | 3 | 6 | 8 | 6 | 2 | 10 |
| 1585: | 6 | 1 | 3 | 6 | 4 | 4 | 3 | 7 |
| 1593: | 7 | 5 | 3 | 6 | 3 | 6 | 2 | 2 |
| 1601: | 4 | 3 | 6 | 6 | 5 | 3 | 6 | 9 |
| 1609: | 5 | 3 | 4 | 1 | 5 | 2 | 2 | 3 |
| 1617: | 4 | 4 | 3 | 3 | 5 | 4 | 6 | 5 |
| 1625: | 4 | 1 | 8 | 3 | 5 | 3 | 8 | 6 |
| 1633: | 2 | 2 | 4 | 6 | 5 | 4 | 4 | 8 |
| 1641: | 6 | 4 | 3 | 3 | 4 | 4 | 4 | 6 |
| 1649: | 7 | 1 | 2 | 9 | 1 | 6 | 4 | 4 |
| 1657: | 3 | 4 | 6 | 2 | 6 | 2 | 4 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 5 | 1 | 6 | 3 | 4 | 5 | 3 | 5 |

Sample Title: GAS-1402

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 10 | 5 | 4 | 9 | 4 | 5 | 1 | 3 |
| 1681: | 3 | 2 | 2 | 2 | 4 | 4 | 1 | 3 |
| 1689: | 4 | 3 | 4 | 3 | 8 | 5 | 4 | 4 |
| 1697: | 2 | 3 | 6 | 3 | 4 | 4 | 4 | 5 |
| 1705: | 3 | 4 | 2 | 3 | 3 | 2 | 1 | 4 |
| 1713: | 4 | 4 | 4 | 3 | 2 | 6 | 6 | 2 |
| 1721: | 6 | 5 | 2 | 4 | 4 | 4 | 2 | 3 |
| 1729: | 2 | 9 | 0 | 2 | 3 | 4 | 3 | 5 |
| 1737: | 4 | 2 | 2 | 5 | 5 | 4 | 4 | 3 |
| 1745: | 4 | 5 | 3 | 5 | 2 | 6 | 7 | 2 |
| 1753: | 7 | 1 | 2 | 2 | 2 | 4 | 2 | 6 |
| 1761: | 4 | 6 | 5 | 7 | 3 | 4 | 3 | 0 |
| 1769: | 6 | 1 | 2 | 5 | 3 | 5 | 2 | 1 |
| 1777: | 2 | 3 | 4 | 1 | 4 | 0 | 4 | 1 |
| 1785: | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| 1793: | 4 | 4 | 3 | 2 | 6 | 1 | 3 | 6 |
| 1801: | 5 | 2 | 7 | 3 | 1 | 1 | 3 | 3 |
| 1809: | 4 | 0 | 3 | 4 | 3 | 1 | 2 | 3 |
| 1817: | 1 | 6 | 3 | 2 | 8 | 3 | 5 | 2 |
| 1825: | 1 | 5 | 5 | 4 | 2 | 5 | 2 | 1 |
| 1833: | 8 | 11 | 8 | 14 | 7 | 5 | 5 | 7 |
| 1841: | 1 | 5 | 4 | 3 | 1 | 4 | 9 | 5 |
| 1849: | 3 | 2 | 5 | 1 | 1 | 1 | 2 | 3 |
| 1857: | 2 | 0 | 0 | 3 | 4 | 4 | 5 | 6 |
| 1865: | 1 | 3 | 1 | 2 | 3 | 1 | 0 | 6 |
| 1873: | 3 | 4 | 2 | 2 | 3 | 3 | 5 | 2 |
| 1881: | 1 | 3 | 1 | 2 | 6 | 0 | 4 | 5 |
| 1889: | 7 | 2 | 4 | 2 | 4 | 2 | 3 | 3 |
| 1897: | 4 | 3 | 3 | 2 | 2 | 5 | 6 | 3 |
| 1905: | 3 | 1 | 1 | 4 | 2 | 1 | 5 | 4 |
| 1913: | 2 | 3 | 1 | 1 | 1 | 7 | 4 | 4 |
| 1921: | 4 | 2 | 1 | 2 | 3 | 1 | 2 | 2 |
| 1929: | 3 | 3 | 5 | 6 | 6 | 3 | 4 | 6 |
| 1937: | 5 | 2 | 4 | 2 | 7 | 5 | 5 | 1 |
| 1945: | 4 | 4 | 3 | 2 | 0 | 1 | 3 | 3 |
| 1953: | 2 | 0 | 0 | 0 | 2 | 4 | 2 | 4 |
| 1961: | 1 | 1 | 5 | 6 | 2 | 6 | 5 | 4 |
| 1969: | 5 | 0 | 3 | 1 | 2 | 1 | 3 | 5 |
| 1977: | 3 | 0 | 1 | 2 | 3 | 3 | 5 | 3 |
| 1985: | 3 | 4 | 2 | 4 | 4 | 4 | 4 | 3 |
| 1993: | 1 | 1 | 5 | 1 | 4 | 1 | 2 | 4 |
| 2001: | 0 | 2 | 4 | 3 | 2 | 4 | 4 | 2 |
| 2009: | 3 | 1 | 4 | 4 | 1 | 3 | 2 | 0 |
| 2017: | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 |
| 2025: | 3 | 2 | 2 | 1 | 1 | 3 | 2 | 3 |
| 2033: | 4 | 2 | 2 | 1 | 3 | 2 | 5 | 2 |
| 2041: | 4 | 4 | 2 | 2 | 0 | 1 | 0 | 4 |
| 2049: | 2 | 6 | 4 | 1 | 1 | 2 | 0 | 5 |
| 2057: | 4 | 0 | 3 | 1 | 2 | 2 | 2 | 5 |
| 2065: | 2 | 0 | 6 | 2 | 4 | 3 | 3 | 3 |
| 2073: | 2 | 5 | 0 | 2 | 1 | 0 | 0 | 2 |
| 2081: | 0 | 1 | 1 | 3 | 0 | 3 | 4 | 1 |
| 2089: | 1 | 2 | 0 | 3 | 4 | 1 | 3 | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 4 | 1 | 2 | 3 | 5 | 0 | 5 | 2 |

Sample Title: GAS-1402

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 4 | 0 | 4 | 5 | 0 | 2 | 1 | 3 |
| 2113: | 2 | 3 | 2 | 4 | 2 | 4 | 4 | 1 |
| 2121: | 3 | 4 | 2 | 2 | 2 | 2 | 1 | 1 |
| 2129: | 2 | 0 | 5 | 1 | 2 | 3 | 2 | 6 |
| 2137: | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 3 |
| 2145: | 0 | 1 | 3 | 0 | 1 | 3 | 2 | 1 |
| 2153: | 4 | 3 | 2 | 2 | 3 | 2 | 2 | 1 |
| 2161: | 3 | 3 | 3 | 0 | 0 | 1 | 3 | 3 |
| 2169: | 4 | 2 | 1 | 0 | 1 | 4 | 6 | 7 |
| 2177: | 0 | 3 | 1 | 5 | 1 | 0 | 1 | 2 |
| 2185: | 3 | 2 | 1 | 2 | 5 | 2 | 2 | 2 |
| 2193: | 3 | 0 | 2 | 1 | 1 | 8 | 3 | 0 |
| 2201: | 2 | 0 | 1 | 1 | 2 | 0 | 4 | 0 |
| 2209: | 1 | 5 | 1 | 2 | 4 | 2 | 4 | 2 |
| 2217: | 4 | 1 | 1 | 0 | 3 | 2 | 2 | 1 |
| 2225: | 5 | 0 | 3 | 1 | 1 | 0 | 5 | 0 |
| 2233: | 3 | 2 | 1 | 1 | 4 | 6 | 3 | 0 |
| 2241: | 2 | 1 | 3 | 0 | 2 | 2 | 1 | 0 |
| 2249: | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 0 |
| 2257: | 3 | 2 | 1 | 4 | 4 | 4 | 0 | 2 |
| 2265: | 1 | 3 | 3 | 1 | 4 | 2 | 1 | 0 |
| 2273: | 1 | 2 | 4 | 1 | 3 | 2 | 3 | 3 |
| 2281: | 5 | 2 | 0 | 0 | 1 | 2 | 2 | 1 |
| 2289: | 2 | 1 | 0 | 1 | 4 | 4 | 1 | 3 |
| 2297: | 1 | 2 | 0 | 1 | 2 | 4 | 0 | 1 |
| 2305: | 3 | 0 | 2 | 2 | 5 | 1 | 1 | 1 |
| 2313: | 2 | 3 | 0 | 2 | 1 | 1 | 1 | 0 |
| 2321: | 0 | 3 | 1 | 0 | 0 | 2 | 0 | 2 |
| 2329: | 3 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 2337: | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 1 |
| 2345: | 3 | 4 | 0 | 0 | 0 | 3 | 1 | 0 |
| 2353: | 0 | 1 | 2 | 0 | 1 | 3 | 1 | 1 |
| 2361: | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| 2369: | 0 | 0 | 0 | 1 | 3 | 1 | 1 | 1 |
| 2377: | 0 | 3 | 1 | 0 | 0 | 2 | 0 | 0 |
| 2385: | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 |
| 2393: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2401: | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 2 |
| 2409: | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 0 |
| 2417: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2425: | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| 2433: | 0 | 2 | 0 | 1 | 1 | 2 | 0 | 1 |
| 2441: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2449: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2457: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2473: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2481: | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| 2489: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2497: | 0 | 1 | 0 | 0 | 0 | 2 | 8 | 18 |
| 2505: | 16 | 20 | 13 | 3 | 1 | 0 | 0 | 0 |
| 2513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: GAS-1402

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2545: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2553: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2569: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2577: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2585: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2601: | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 |
| 2609: | 0 | 0 | 2 | 1 | 4 | 4 | 1 | 3 |
| 2617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2625: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2633: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2761: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2801: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2817: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2841: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2865: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2873: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2897: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2921: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Sample Title: GAS-1402

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3017: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3073: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3081: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3193: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3233: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3241: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3385: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

Sample Title: GAS-1402

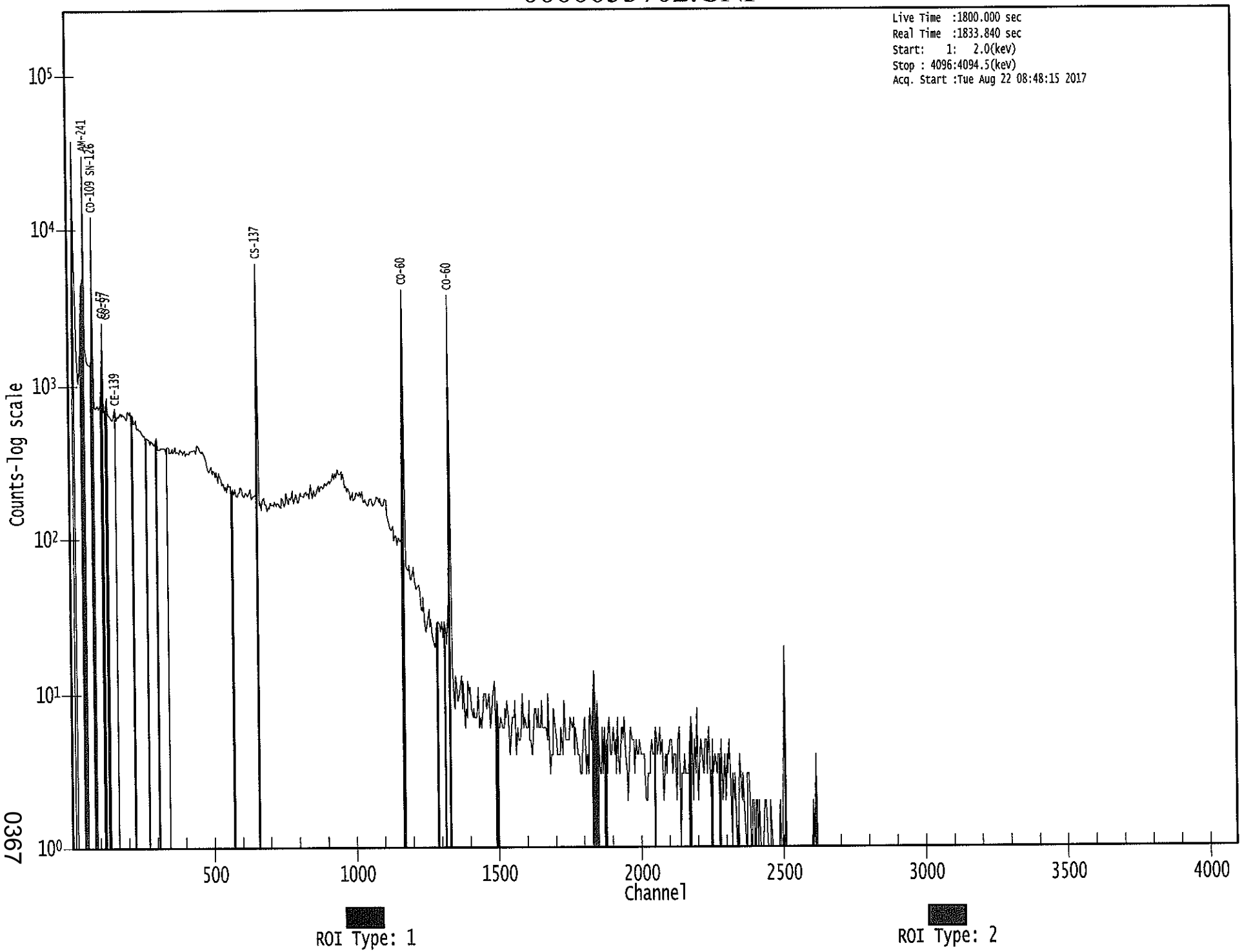
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3489: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3505: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3657: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3673: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: GAS-1402

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3841: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3873: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3889: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |

# 0000055702.CNF

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Apex-Gamma

8/22

Analysis Report for 1707087-02

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# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-02 |
| Sample Description | : BLANK |
| Sample Type | : SOIL |
| Sample Size | : 7.834E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 8/22/2017 5:40:36AM |
| Acquisition Started | : 8/22/2017 9:20:11AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE4 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3613.2 seconds |
| Dead Time | : 0.37 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 15 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55707 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

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8/23/17

Analysis Report for 1707087-02

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# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 10:20:25AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 93.86 | 92.93 | 0.0000 | 0.00 |
| 2 | 240.01 | 239.12 | 0.0000 | 0.00 |
| 3 | 349.81 | 348.96 | 0.0000 | 0.00 |
| 4 | 360.83 | 359.98 | 0.0000 | 0.00 |
| 5 | 488.49 | 487.68 | 0.0000 | 0.00 |
| 6 | 509.92 | 509.12 | 0.0000 | 0.00 |
| 7 | 610.16 | 609.40 | 0.0000 | 0.00 |
| 8 | 769.28 | 768.59 | 0.0000 | 0.00 |
| 9 | 824.44 | 823.77 | 0.0000 | 0.00 |
| 10 | 960.04 | 959.42 | 0.0000 | 0.00 |
| 11 | 1001.72 | 1001.13 | 0.0000 | 0.00 |
| 12 | 1071.22 | 1070.66 | 0.0000 | 0.00 |
| 13 | 1141.65 | 1141.12 | 0.0000 | 0.00 |
| 14 | 1222.40 | 1221.90 | 0.0000 | 0.00 |
| 15 | 1235.18 | 1234.69 | 0.0000 | 0.00 |
| 16 | 1509.35 | 1509.00 | 0.0000 | 0.00 |
| 17 | 1707.05 | 1706.80 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-02

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# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 10:20:25AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|
| 1 | 93.86 | 89 - | 99 | 92.93 | 6.70E+01 | 45.93 | 2.40E+02 | 2.25 |
| 2 | 240.01 | 235 - | 244 | 239.12 | 2.70E+01 | 31.91 | 1.30E+02 | 4.85 |
| 3 | 349.81 | 344 - | 354 | 348.96 | 2.61E+01 | 22.77 | 5.58E+01 | 5.43 |
| 4 | 360.83 | 356 - | 362 | 359.98 | 1.38E+01 | 16.33 | 3.84E+01 | 1.59 |
| 5 | 488.49 | 484 - | 491 | 487.68 | 1.13E+01 | 14.56 | 2.74E+01 | 2.83 |
| 6 | 509.92 | 503 - | 514 | 509.12 | 5.66E+01 | 23.58 | 3.88E+01 | 2.90 |
| 7 | 610.16 | 604 - | 613 | 609.40 | 2.41E+01 | 15.36 | 1.97E+01 | 5.89 |
| 8 | 769.28 | 763 - | 772 | 768.59 | 1.60E+01 | 11.58 | 1.00E+01 | 4.85 |
| 9 | 824.44 | 821 - | 826 | 823.77 | 6.63E+00 | 6.40 | 2.75E+00 | 2.46 |
| 10 | 960.04 | 955 - | 963 | 959.42 | 1.19E+01 | 10.22 | 8.13E+00 | 4.22 |
| 11 | 1001.72 | 998 - | 1003 | 1001.13 | 8.00E+00 | 5.66 | 0.00E+00 | 1.77 |
| 12 | 1071.22 | 1068 - | 1073 | 1070.66 | 7.72E+00 | 6.71 | 2.56E+00 | 1.98 |
| 13 | 1141.65 | 1138 - | 1143 | 1141.12 | 7.00E+00 | 7.62 | 6.00E+00 | 2.76 |
| 14 | 1222.40 | 1219 - | 1224 | 1221.90 | 5.57E+00 | 6.08 | 2.86E+00 | 1.53 |
| 15 | 1235.18 | 1232 - | 1237 | 1234.69 | 4.67E+00 | 5.74 | 2.67E+00 | 1.89 |
| 16 | 1509.35 | 1505 - | 1511 | 1509.00 | 5.00E+00 | 4.47 | 0.00E+00 | 2.98 |
| 17 | 1707.05 | 1703 - | 1709 | 1706.80 | 5.00E+00 | 4.47 | 0.00E+00 | 2.75 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 10:20:25AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Analysis Report for 1707087-02

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| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 1 | 93.86 | 89 - | 99 | 6.70E+01 | 45.93 | 2.40E+02 | 3.53E+01 |
| 2 | 240.01 | 235 - | 244 | 2.70E+01 | 31.91 | 1.30E+02 | 2.48E+01 |
| 3 | 349.81 | 344 - | 354 | 2.61E+01 | 22.77 | 5.58E+01 | 1.67E+01 |
| 4 | 360.83 | 356 - | 362 | 1.38E+01 | 16.33 | 3.84E+01 | 1.20E+01 |
| 5 | 488.49 | 484 - | 491 | 1.13E+01 | 14.56 | 2.74E+01 | 1.06E+01 |
| 6 | 509.92 | 503 - | 514 | 5.66E+01 | 23.58 | 3.88E+01 | 1.49E+01 |
| 7 | 610.16 | 604 - | 613 | 2.41E+01 | 15.36 | 1.97E+01 | 9.71E+00 |
| 8 | 769.28 | 763 - | 772 | 1.60E+01 | 11.58 | 1.00E+01 | 6.88E+00 |
| 9 | 824.44 | 821 - | 826 | 6.63E+00 | 6.40 | 2.75E+00 | 3.13E+00 |
| 10 | 960.04 | 955 - | 963 | 1.19E+01 | 10.22 | 8.13E+00 | 6.19E+00 |
| 11 | 1001.72 | 998 - | 1003 | 8.00E+00 | 5.66 | 0.00E+00 | 0.00E+00 |
| 12 | 1071.22 | 1068 - | 1073 | 7.72E+00 | 6.71 | 2.56E+00 | 3.09E+00 |
| 13 | 1141.65 | 1138 - | 1143 | 7.00E+00 | 7.62 | 6.00E+00 | 4.50E+00 |
| 14 | 1222.40 | 1219 - | 1224 | 5.57E+00 | 6.08 | 2.86E+00 | 3.15E+00 |
| 15 | 1235.18 | 1232 - | 1237 | 4.67E+00 | 5.74 | 2.67E+00 | 3.11E+00 |
| 16 | 1509.35 | 1505 - | 1511 | 5.00E+00 | 4.47 | 0.00E+00 | 0.00E+00 |
| 17 | 1707.05 | 1703 - | 1709 | 5.00E+00 | 4.47 | 0.00E+00 | 0.00E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 10:20:25AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|
| 1 | 93.86 | 89 - | 99 | 92.93 | 6.70E+01 | 45.93 | 2.40E+02 | GA-67 |
| 2 | 240.01 | 235 - | 244 | 239.12 | 2.70E+01 | 31.91 | 1.30E+02 | RA-224 |
| 3 | 349.81 | 344 - | 354 | 348.96 | 2.61E+01 | 22.77 | 5.58E+01 | ..... |
| 4 | 360.83 | 356 - | 362 | 359.98 | 1.38E+01 | 16.33 | 3.84E+01 | ..... |
| 5 | 488.49 | 484 - | 491 | 487.68 | 1.13E+01 | 14.56 | 2.74E+01 | ..... |
| 6 | 509.92 | 503 - | 514 | 509.12 | 5.66E+01 | 23.58 | 3.88E+01 | ..... |
| 7 | 610.16 | 604 - | 613 | 609.40 | 2.41E+01 | 15.36 | 1.97E+01 | BI-214 |
| 8 | 769.28 | 763 - | 772 | 768.59 | 1.60E+01 | 11.58 | 1.00E+01 | ..... |

Analysis Report for 1707087-02

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| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|
| 9 | 824.44 | 821 - | 826 | 823.77 | 6.63E+00 | 6.40 | 2.75E+00 | ..... |
| 10 | 960.04 | 955 - | 963 | 959.42 | 1.19E+01 | 10.22 | 8.13E+00 | ..... |
| 11 | 1001.72 | 998 - | 1003 | 1001.13 | 8.00E+00 | 5.66 | 0.00E+00 | PA-234M |
| 12 | 1071.22 | 1068 - | 1073 | 1070.66 | 7.72E+00 | 6.71 | 2.56E+00 | ..... |
| 13 | 1141.65 | 1138 - | 1143 | 1141.12 | 7.00E+00 | 7.62 | 6.00E+00 | ..... |
| 14 | 1222.40 | 1219 - | 1224 | 1221.90 | 5.57E+00 | 6.08 | 2.86E+00 | TA-182 |
| 15 | 1235.18 | 1232 - | 1237 | 1234.69 | 4.67E+00 | 5.74 | 2.67E+00 | CS-136 |
| 16 | 1509.35 | 1505 - | 1511 | 1509.00 | 5.00E+00 | 4.47 | 0.00E+00 | ..... |
| 17 | 1707.05 | 1703 - | 1709 | 1706.80 | 5.00E+00 | 4.47 | 0.00E+00 | ..... |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 10:20:25AM

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 1 | 93.86 | 6.70E+01 | 45.93 | 2.36E-02 | 2.08E-03 |
| 2 | 240.01 | 2.70E+01 | 31.91 | 1.35E-02 | 1.14E-03 |
| 3 | 349.81 | 2.61E+01 | 22.77 | 9.27E-03 | 7.99E-04 |
| 4 | 360.83 | 1.38E+01 | 16.33 | 8.98E-03 | 7.75E-04 |
| 5 | 488.49 | 1.13E+01 | 14.56 | 6.58E-03 | 6.70E-04 |
| 6 | 509.92 | 5.66E+01 | 23.58 | 6.30E-03 | 6.62E-04 |
| 7 | 610.16 | 2.41E+01 | 15.36 | 5.27E-03 | 6.20E-04 |
| 8 | 769.28 | 1.60E+01 | 11.58 | 4.22E-03 | 4.64E-04 |
| 9 | 824.44 | 6.63E+00 | 6.40 | 3.96E-03 | 3.94E-04 |
| 10 | 960.04 | 1.19E+01 | 10.22 | 3.45E-03 | 2.87E-04 |
| 11 | 1001.72 | 8.00E+00 | 5.66 | 3.33E-03 | 2.78E-04 |
| 12 | 1071.22 | 7.72E+00 | 6.71 | 3.14E-03 | 2.61E-04 |
| 13 | 1141.65 | 7.00E+00 | 7.62 | 2.97E-03 | 2.45E-04 |
| 14 | 1222.40 | 5.57E+00 | 6.08 | 2.79E-03 | 2.34E-04 |
| 15 | 1235.18 | 4.67E+00 | 5.74 | 2.77E-03 | 2.33E-04 |
| 16 | 1509.35 | 5.00E+00 | 4.47 | 2.32E-03 | 2.00E-04 |
| 17 | 1707.05 | 5.00E+00 | 4.47 | 2.06E-03 | 1.71E-04 |

Analysis Report for 1707087-02

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 10:20:25AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|
| 1 | 93.86 | 6.70E+01 | 45.93 | | | 6.70E+01 | 4.59E+01 |
| 2 | 240.01 | 2.70E+01 | 31.91 | | | 2.70E+01 | 3.19E+01 |
| 3 | 349.81 | 2.61E+01 | 22.77 | | | 2.61E+01 | 2.28E+01 |
| 4 | 360.83 | 1.38E+01 | 16.33 | | | 1.38E+01 | 1.63E+01 |
| 5 | 488.49 | 1.13E+01 | 14.56 | | | 1.13E+01 | 1.46E+01 |
| 6 | 509.92 | 5.66E+01 | 23.58 | | | 5.66E+01 | 2.36E+01 |
| 7 | 610.16 | 2.41E+01 | 15.36 | | | 2.41E+01 | 1.54E+01 |
| 8 | 769.28 | 1.60E+01 | 11.58 | | | 1.60E+01 | 1.16E+01 |
| 9 | 824.44 | 6.63E+00 | 6.40 | | | 6.63E+00 | 6.40E+00 |
| 10 | 960.04 | 1.19E+01 | 10.22 | | | 1.19E+01 | 1.02E+01 |
| 11 | 1001.72 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| 12 | 1071.22 | 7.72E+00 | 6.71 | | | 7.72E+00 | 6.71E+00 |
| 13 | 1141.65 | 7.00E+00 | 7.62 | | | 7.00E+00 | 7.62E+00 |
| 14 | 1222.40 | 5.57E+00 | 6.08 | | | 5.57E+00 | 6.08E+00 |
| 15 | 1235.18 | 4.67E+00 | 5.74 | | | 4.67E+00 | 5.74E+00 |
| 16 | 1509.35 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |
| 17 | 1707.05 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |

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

Analysis Report for 1707087-02

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# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 10:20:25AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

Corrected Area is: Original * Peak Ratio - Background

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 1 | 93.86 | 6.70E+01 | 45.93 | | | 6.70E+01 | 4.59E+01 |
| 2 | 240.01 | 2.70E+01 | 31.91 | | | 2.70E+01 | 3.19E+01 |
| 3 | 349.81 | 2.61E+01 | 22.77 | | | 2.61E+01 | 2.28E+01 |
| 4 | 360.83 | 1.38E+01 | 16.33 | | | 1.38E+01 | 1.63E+01 |
| 5 | 488.49 | 1.13E+01 | 14.56 | | | 1.13E+01 | 1.46E+01 |
| 6 | 509.92 | 5.66E+01 | 23.58 | | | 5.66E+01 | 2.36E+01 |
| 7 | 610.16 | 2.41E+01 | 15.36 | | | 2.41E+01 | 1.54E+01 |
| 8 | 769.28 | 1.60E+01 | 11.58 | | | 1.60E+01 | 1.16E+01 |
| 9 | 824.44 | 6.63E+00 | 6.40 | | | 6.63E+00 | 6.40E+00 |
| 10 | 960.04 | 1.19E+01 | 10.22 | | | 1.19E+01 | 1.02E+01 |
| 11 | 1001.72 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| 12 | 1071.22 | 7.72E+00 | 6.71 | | | 7.72E+00 | 6.71E+00 |
| 13 | 1141.65 | 7.00E+00 | 7.62 | | | 7.00E+00 | 7.62E+00 |
| 14 | 1222.40 | 5.57E+00 | 6.08 | | | 5.57E+00 | 6.08E+00 |
| 15 | 1235.18 | 4.67E+00 | 5.74 | | | 4.67E+00 | 5.74E+00 |
| 16 | 1509.35 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |
| 17 | 1707.05 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| GA-67 | 0.550 | 93.31 | * | 35.70 | 7.90E-02 | 1.04E-01 |

Analysis Report for 1707087-02

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| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| GA-67 | 0.550 | 208.95 | | 2.24 | | |
| | | 300.22 | | 16.00 | | |
| BI-214 | 0.393 | 609.31 | * | 46.30 | 9.49E-02 | 6.14E-02 |
| | | 1120.29 | | 15.10 | | |
| | | 1764.49 | | 15.80 | | |
| | | 2204.22 | | 4.98 | | |
| RA-224 | 0.861 | 240.98 | * | 3.95 | 4.85E-01 | 5.74E-01 |
| PA-234M | 0.926 | 1001.03 | * | 0.92 | 2.51E+00 | 1.78E+00 |

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 10:20:25AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 3 | 349.81 | 7.25309E-03 | 43.60 | | |
| 4 | 360.83 | 3.83838E-03 | 59.10 | | |
| 5 | 488.49 | 3.14444E-03 | 64.31 | | |
| 6 | 509.92 | 1.57255E-02 | 20.83 | | |
| 8 | 769.28 | 4.44444E-03 | 36.17 | | |
| 9 | 824.44 | 1.84028E-03 | 48.33 | | |
| 10 | 960.04 | 3.31597E-03 | 42.82 | | |
| 12 | 1071.22 | 2.14506E-03 | 43.43 | | |
| 13 | 1141.65 | 1.94444E-03 | 54.40 | | |
| 14 | 1222.40 | 1.54762E-03 | 54.59 | Tol. | TA-182 |
| 15 | 1235.18 | 1.29630E-03 | 61.55 | Tol. | CS-136 |
| 16 | 1509.35 | 1.38889E-03 | 44.72 | | |
| 17 | 1707.05 | 1.38889E-03 | 44.72 | | |

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

Analysis Report for 1707087-02
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# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| GA-67 | 0.55 | 93.31 | * | 35.70 | 7.90E-02 | 1.04E-01 |
| | | 208.95 | | 2.24 | | |
| | | 300.22 | | 16.00 | | |
| BI-214 | 0.39 | 609.31 | * | 46.30 | 9.49E-02 | 6.14E-02 |
| | | 1120.29 | | 15.10 | | |
| | | 1764.49 | | 15.80 | | |
| | | 2204.22 | | 4.98 | | |
| RA-224 | 0.86 | 240.98 | * | 3.95 | 4.85E-01 | 5.74E-01 |
| PA-234M | 0.92 | 1001.03 | * | 0.92 | 2.51E+00 | 1.78E+00 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| GA-67 | 0.550 | 7.90E-02 | 1.04E-01 | |
| BI-214 | 0.393 | 9.49E-02 | 6.14E-02 | |
| RA-224 | 0.861 | 4.85E-01 | 5.74E-01 | |
| PA-234M | 0.926 | 2.51E+00 | 1.78E+00 | |

Analysis Report for 1707087-02

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? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-02

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## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 10:20:25AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 3 | 349.81 | 7.25309E-03 | 43.60 | | |
| 4 | 360.83 | 3.83838E-03 | 59.10 | | |
| 5 | 488.49 | 3.14444E-03 | 64.31 | | |
| 6 | 509.92 | 1.57255E-02 | 20.83 | | |
| 8 | 769.28 | 4.44444E-03 | 36.17 | | |
| 9 | 824.44 | 1.84028E-03 | 48.33 | | |
| 10 | 960.04 | 3.31597E-03 | 42.82 | | |
| 12 | 1071.22 | 2.14506E-03 | 43.43 | | |
| 13 | 1141.65 | 1.94444E-03 | 54.40 | | |
| 14 | 1222.40 | 1.54762E-03 | 54.59 | Tol. | TA-182 |
| 15 | 1235.18 | 1.29630E-03 | 61.55 | Tol. | CS-136 |
| 16 | 1509.35 | 1.38889E-03 | 44.72 | | |
| 17 | 1707.05 | 1.38889E-03 | 44.72 | | |

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

## NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | 10.42 | -4.45E-02 | 3.22E-01 | 3.22E-01 |
| + | NA-22 | 1274.54 | 99.94 | 9.10E-03 | 5.02E-02 | 5.02E-02 |
| + | NA-24 | 1368.53 | 99.99 | 3.06E-04 | 2.64E-02 | 6.02E-02 |
| | | 2754.09 | 99.86 | 0.00E+00 | | 2.64E-02 |

Analysis Report for 1707087-02

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | AL-26 | 1808.65 | | 99.76 | 9.85E-03 | 6.46E-02 | 6.46E-02 |
| + | K-40 | 1460.81 | | 10.67 | 1.13E-01 | 5.31E-01 | 5.31E-01 |
| + | AR-41 | 1293.64 | | 99.16 | 8.53E-02 | 3.05E-01 | 3.05E-01 |
| + | TI-44 | 67.88 | | 94.40 | -3.62E-02 | 2.26E-02 | 2.37E-02 |
| | | 78.34 | | 96.00 | -4.76E-04 | | 2.26E-02 |
| + | SC-46 | 889.25 | | 99.98 | -1.69E-02 | 4.52E-02 | 4.52E-02 |
| | | 1120.51 | | 99.99 | 3.31E-02 | | 7.15E-02 |
| + | V-48 | 983.52 | | 99.98 | 6.07E-03 | 4.53E-02 | 4.53E-02 |
| | | 1312.10 | | 97.50 | -2.34E-03 | | 5.67E-02 |
| + | CR-51 | 320.08 | | 9.83 | 3.85E-02 | 3.06E-01 | 3.06E-01 |
| + | MN-54 | 834.83 | | 99.97 | -9.08E-03 | 4.61E-02 | 4.61E-02 |
| + | CO-56 | 846.75 | | 99.96 | 3.72E-03 | 5.15E-02 | 5.15E-02 |
| | | 1037.75 | | 14.03 | 1.27E-01 | | 4.40E-01 |
| | | 1238.25 | | 67.00 | -1.30E-02 | | 9.04E-02 |
| | | 1771.40 | | 15.51 | -1.40E-01 | | 2.89E-01 |
| | | 2598.48 | | 16.90 | 2.20E-01 | | 5.77E-01 |
| + | CO-57 | 122.06 | | 85.51 | -3.20E-03 | 2.07E-02 | 2.07E-02 |
| | | 136.48 | | 10.60 | 2.81E-02 | | 1.87E-01 |
| + | CO-58 | 810.76 | | 99.40 | -2.04E-02 | 4.52E-02 | 4.52E-02 |
| + | FE-59 | 1099.22 | | 56.50 | 4.48E-02 | 1.12E-01 | 1.12E-01 |
| | | 1291.56 | | 43.20 | 3.09E-02 | | 1.52E-01 |
| + | CO-60 | 1173.22 | | 100.00 | -3.31E-03 | 4.85E-02 | 5.25E-02 |
| | | 1332.49 | | 100.00 | 4.69E-03 | | 4.85E-02 |
| + | ZN-65 | 1115.52 | | 50.75 | -3.12E-03 | 1.09E-01 | 1.09E-01 |
| + | GA-67 | 93.31 | * | 35.70 | 7.90E-02 | 8.64E-02 | 8.64E-02 |
| | | 208.95 | | 2.24 | -3.15E-01 | | 1.12E+00 |
| | | 300.22 | | 16.00 | 2.54E-02 | | 1.86E-01 |
| + | SE-75 | 121.11 | | 16.70 | 7.03E-03 | 3.36E-02 | 1.08E-01 |
| | | 136.00 | | 59.20 | 3.30E-03 | | 3.36E-02 |
| | | 264.65 | | 59.80 | -2.68E-02 | | 3.94E-02 |
| | | 279.53 | | 25.20 | 5.30E-02 | | 1.07E-01 |
| | | 400.65 | | 11.40 | 1.37E-03 | | 2.40E-01 |
| + | RB-82 | 776.52 | | 13.00 | -2.12E-01 | 2.81E-01 | 2.81E-01 |
| + | RB-83 | 520.41 | | 46.00 | -2.89E-02 | 7.40E-02 | 7.40E-02 |
| | | 529.64 | | 30.30 | -5.49E-02 | | 1.05E-01 |
| | | 552.65 | | 16.40 | -4.79E-02 | | 2.26E-01 |
| + | KR-85 | 513.99 | | 0.43 | 4.20E-01 | 1.28E+01 | 1.28E+01 |
| + | SR-85 | 513.99 | | 99.27 | 1.84E-03 | 5.62E-02 | 5.62E-02 |
| + | Y-88 | 898.02 | | 93.40 | 1.88E-02 | 5.64E-02 | 5.64E-02 |
| | | 1836.01 | | 99.38 | 0.00E+00 | | 7.08E-02 |
| + | MO-93 | 263.06 | | 56.72 | -5.50E-03 | 4.44E-02 | 4.44E-02 |
| | | 684.67 | | 99.68 | 1.28E-03 | | 4.80E-02 |
| | | 1477.11 | | 99.08 | -8.19E-03 | | 4.92E-02 |
| + | NB-93M | 16.57 | | 9.43 | 7.05E+00 | 4.31E+00 | 4.31E+00 |
| + | NB-94 | 702.63 | | 100.00 | -1.80E-02 | 4.79E-02 | 5.32E-02 |
| | | 871.10 | | 100.00 | 1.80E-02 | | 4.79E-02 |
| + | NB-95 | 765.79 | | 99.81 | 1.70E-03 | 4.84E-02 | 4.84E-02 |

Analysis Report for 1707087-02

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| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | NB-95M | 235.69 | 25.00 | 2.31E-02 | 1.05E-01 | 1.05E-01 |
| + | ZR-95 | 724.18 | 43.70 | 7.85E-02 | 8.63E-02 | 1.23E-01 |
| | | 756.72 | 55.30 | 4.05E-02 | | 8.63E-02 |
| + | MO-99 | 181.06 | 6.20 | -4.64E-01 | 3.67E-01 | 3.67E-01 |
| | | 739.58 | 12.80 | 8.33E-03 | | 3.70E-01 |
| | | 778.00 | 4.50 | -5.06E-01 | | 9.66E-01 |
| + | RU-103 | 497.08 | 89.00 | -5.28E-04 | 3.84E-02 | 3.84E-02 |
| + | RU-106 | 621.84 | 9.80 | 1.03E-01 | 3.69E-01 | 3.69E-01 |
| + | AG-108M | 433.93 | 89.90 | -3.98E-03 | 2.80E-02 | 2.80E-02 |
| | | 614.37 | 90.40 | -5.50E-03 | | 4.44E-02 |
| | | 722.95 | 90.50 | 1.68E-02 | | 5.69E-02 |
| + | CD-109 | 88.03 | 3.72 | 7.86E-02 | 5.53E-01 | 5.53E-01 |
| + | AG-110M | 657.75 | 93.14 | -1.55E-02 | 4.60E-02 | 4.60E-02 |
| | | 677.61 | 10.53 | 2.49E-02 | | 4.50E-01 |
| | | 706.67 | 16.46 | 1.16E-01 | | 3.31E-01 |
| | | 763.93 | 21.98 | 1.28E-03 | | 1.93E-01 |
| | | 884.67 | 71.63 | 3.64E-02 | | 8.47E-02 |
| | | 1384.27 | 23.94 | -5.44E-02 | | 2.10E-01 |
| + | CD-113M | 263.70 | 0.02 | 1.22E+01 | 1.12E+02 | 1.12E+02 |
| + | SN-113 | 255.12 | 1.93 | 7.92E-01 | 4.65E-02 | 1.53E+00 |
| | | 391.69 | 64.90 | 6.09E-04 | | 4.65E-02 |
| + | TE123M | 159.00 | 84.10 | -2.18E-03 | 2.43E-02 | 2.43E-02 |
| + | SB-124 | 602.71 | 97.87 | -4.60E-03 | 3.34E-02 | 3.34E-02 |
| | | 645.85 | 7.26 | -1.66E-02 | | 5.00E-01 |
| | | 722.78 | 11.10 | 1.37E-01 | | 4.64E-01 |
| | | 1691.02 | 49.00 | -3.66E-02 | | 1.01E-01 |
| + | I-125 | 35.49 | 6.49 | -1.64E-01 | 6.41E-01 | 6.41E-01 |
| + | SB-125 | 176.33 | 6.89 | -1.28E-01 | 8.99E-02 | 3.03E-01 |
| | | 427.89 | 29.33 | -2.13E-02 | | 8.99E-02 |
| | | 463.38 | 10.35 | -1.21E-02 | | 3.27E-01 |
| | | 600.56 | 17.80 | 1.15E-02 | | 2.03E-01 |
| | | 635.90 | 11.32 | -7.39E-02 | | 3.15E-01 |
| + | SB-126 | 414.70 | 83.30 | 8.16E-03 | 4.08E-02 | 4.08E-02 |
| | | 666.33 | 99.60 | 1.80E-02 | | 5.40E-02 |
| | | 695.00 | 99.60 | -1.13E-03 | | 5.53E-02 |
| | | 720.50 | 53.80 | 3.61E-02 | | 9.42E-02 |
| + | SN-126 | 87.57 | 37.00 | 7.91E-03 | 5.56E-02 | 5.56E-02 |
| + | SB-127 | 473.00 | 25.00 | -4.74E-02 | 1.38E-01 | 1.43E-01 |
| | | 685.20 | 35.70 | 3.68E-03 | | 1.38E-01 |
| | | 783.80 | 14.70 | 4.46E-02 | | 3.45E-01 |
| + | I-129 | 29.78 | 57.00 | 2.39E-02 | 1.19E-01 | 1.19E-01 |
| | | 33.60 | 13.20 | -2.37E-02 | | 3.73E-01 |
| | | 39.58 | 7.52 | -1.63E-01 | | 4.42E-01 |
| + | I-131 | 284.30 | 6.05 | -8.52E-02 | 3.97E-02 | 4.61E-01 |
| | | 364.48 | 81.20 | -5.48E-03 | | 3.97E-02 |
| | | 636.97 | 7.26 | -2.09E-01 | | 4.99E-01 |
| | | 722.89 | 1.80 | 8.57E-01 | | 2.90E+00 |
| + | TE-132 | 49.72 | 13.10 | -4.99E-02 | 2.79E-02 | 1.96E-01 |

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| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | TE-132 | 228.16 | 88.00 | -7.97E-04 | 2.79E-02 | 2.79E-02 |
| + | BA-133 | 81.00 | 33.00 | -3.46E-02 | 4.47E-02 | 6.22E-02 |
| | | 302.84 | 17.80 | 4.71E-02 | | 1.51E-01 |
| | | 356.01 | 60.00 | -3.67E-02 | | 4.47E-02 |
| + | I-133 | 529.87 | 86.30 | -2.21E-02 | 4.24E-02 | 4.24E-02 |
| + | XE-133 | 81.00 | 38.00 | -3.07E-02 | 5.53E-02 | 5.53E-02 |
| + | CS-134 | 563.23 | 8.38 | -2.07E-01 | 3.94E-02 | 4.16E-01 |
| | | 569.32 | 15.43 | -1.69E-02 | | 2.41E-01 |
| | | 604.70 | 97.60 | 9.24E-04 | | 3.94E-02 |
| | | 795.84 | 85.40 | 1.66E-02 | | 5.34E-02 |
| | | 801.93 | 8.73 | 1.66E-01 | | 6.35E-01 |
| + | CS-135 | 268.24 | 16.00 | 6.38E-03 | 1.60E-01 | 1.60E-01 |
| + | I-135 | 1131.51 | 22.50 | -5.97E-02 | 1.40E-01 | 3.50E-01 |
| | | 1260.41 | 28.60 | -3.81E-02 | | 1.40E-01 |
| | | 1678.03 | 9.54 | 3.29E-02 | | 7.97E-01 |
| + | CS-136 | 153.22 | 7.46 | -2.38E-02 | 3.86E-02 | 2.73E-01 |
| | | 163.89 | 4.61 | 5.29E-02 | | 4.78E-01 |
| | | 176.55 | 13.56 | -9.74E-02 | | 1.50E-01 |
| | | 273.65 | 12.66 | -4.45E-02 | | 1.94E-01 |
| | | 340.57 | 48.50 | 4.52E-02 | | 6.56E-02 |
| | | 818.50 | 99.70 | 1.67E-02 | | 3.86E-02 |
| | | 1048.07 | 79.60 | 2.98E-02 | | 7.41E-02 |
| | | 1235.34 | 19.70 | -5.15E-02 | | 2.66E-01 |
| + | CS-137 | 661.65 | 85.12 | 1.20E-02 | 5.90E-02 | 5.90E-02 |
| + | LA-138 | 788.74 | 34.00 | 1.54E-02 | 9.51E-02 | 1.29E-01 |
| | | 1435.80 | 66.00 | 3.25E-02 | | 9.51E-02 |
| + | CE-139 | 165.85 | 80.35 | 7.57E-03 | 2.85E-02 | 2.85E-02 |
| + | BA-140 | 162.64 | 6.70 | -8.99E-02 | 1.49E-01 | 3.16E-01 |
| | | 304.84 | 4.50 | -3.56E-01 | | 5.67E-01 |
| | | 423.70 | 3.20 | 3.56E-01 | | 9.75E-01 |
| | | 437.55 | 2.00 | 1.57E-01 | | 1.48E+00 |
| | | 537.32 | 25.00 | -1.94E-02 | | 1.49E-01 |
| + | LA-140 | 328.77 | 20.50 | 3.34E-02 | 6.92E-02 | 1.57E-01 |
| | | 487.03 | 45.50 | 1.20E-02 | | 8.07E-02 |
| | | 815.85 | 23.50 | 4.63E-02 | | 1.71E-01 |
| | | 1596.49 | 95.49 | 4.61E-03 | | 6.92E-02 |
| + | CE-141 | 145.44 | 48.40 | 6.44E-03 | 4.13E-02 | 4.13E-02 |
| + | CE-143 | 57.36 | 11.80 | -7.84E-03 | 7.37E-02 | 1.94E-01 |
| | | 293.26 | 42.00 | -3.54E-02 | | 7.37E-02 |
| | | 664.55 | 5.20 | -3.87E-01 | | 1.04E+00 |
| + | CE-144 | 133.54 | 10.80 | 8.29E-02 | 1.82E-01 | 1.82E-01 |
| + | PM-144 | 476.78 | 42.00 | -3.05E-02 | 3.76E-02 | 7.78E-02 |
| | | 618.01 | 98.60 | -6.41E-03 | | 3.76E-02 |
| | | 696.49 | 99.49 | 2.71E-02 | | 5.77E-02 |
| + | PM-145 | 36.85 | 21.70 | 6.02E-02 | 9.67E-02 | 1.81E-01 |
| | | 37.36 | 39.70 | 3.21E-02 | | 9.67E-02 |
| | | 42.30 | 15.10 | -2.54E-01 | | 2.03E-01 |
| | | 72.40 | 2.31 | 3.69E-01 | | 1.02E+00 |
| + | PM-146 | 453.90 | 39.94 | 3.14E-03 | 8.13E-02 | 8.13E-02 |

Analysis Report for 1707087-02

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| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | PM-146 | 735.90 | 14.01 | 3.89E-02 | 8.13E-02 | 3.31E-01 |
| | | 747.13 | 13.10 | -1.08E-01 | | 2.94E-01 |
| + | ND-147 | 91.11 | 28.90 | -4.96E-03 | 8.12E-02 | 8.12E-02 |
| | | 531.02 | 13.10 | 3.19E-02 | | 2.81E-01 |
| + | PM-149 | 285.90 | 3.10 | 2.44E-01 | 9.72E-01 | 9.72E-01 |
| + | EU-152 | 121.78 | 20.50 | -1.33E-02 | 8.62E-02 | 8.62E-02 |
| | | 244.69 | 5.40 | 7.36E-02 | | 5.18E-01 |
| | | 344.27 | 19.13 | 3.07E-02 | | 1.45E-01 |
| | | 778.89 | 9.20 | 8.94E-02 | | 4.70E-01 |
| | | 964.01 | 10.40 | 0.00E+00 | | 5.39E-01 |
| | | 1085.78 | 7.22 | -1.82E-01 | | 6.04E-01 |
| | | 1112.02 | 9.60 | -1.32E-01 | | 4.31E-01 |
| | | 1407.95 | 14.94 | 1.73E-02 | | 3.41E-01 |
| + | GD-153 | 97.43 | 31.30 | 1.22E-03 | 6.53E-02 | 6.53E-02 |
| | | 103.18 | 22.20 | 3.06E-03 | | 8.21E-02 |
| + | EU-154 | 123.07 | 40.50 | 4.03E-04 | 4.53E-02 | 4.53E-02 |
| | | 723.30 | 19.70 | 1.74E-01 | | 2.72E-01 |
| | | 873.19 | 11.50 | 1.12E-01 | | 4.02E-01 |
| | | 996.32 | 10.30 | 0.00E+00 | | 3.34E-01 |
| | | 1004.76 | 17.90 | -7.26E-02 | | 2.81E-01 |
| | | 1274.45 | 35.50 | 2.56E-02 | | 1.41E-01 |
| + | EU-155 | 86.50 | 30.90 | 5.47E-03 | 6.66E-02 | 6.66E-02 |
| | | 105.30 | 20.70 | 8.69E-03 | | 9.00E-02 |
| + | EU-156 | 811.77 | 10.40 | 5.12E-02 | 4.65E-01 | 4.65E-01 |
| | | 1153.47 | 7.20 | 9.64E-02 | | 6.44E-01 |
| | | 1230.71 | 8.90 | 6.08E-02 | | 6.51E-01 |
| + | HO-166M | 184.41 | 72.60 | 3.11E-02 | 3.78E-02 | 3.78E-02 |
| | | 280.45 | 29.60 | 6.45E-03 | | 8.96E-02 |
| | | 410.94 | 11.10 | 3.00E-02 | | 2.91E-01 |
| | | 711.69 | 54.10 | 2.24E-02 | | 8.97E-02 |
| + | TM-171 | 66.72 | 0.14 | -3.11E+00 | 1.75E+01 | 1.75E+01 |
| + | HF-172 | 67.35 | 5.31 | -8.17E-02 | 1.51E-01 | 4.61E-01 |
| | | 125.81 | 11.30 | -9.96E-02 | | 1.51E-01 |
| + | LU-172 | 181.53 | 20.60 | -1.02E-01 | 8.04E-02 | 1.13E-01 |
| | | 900.72 | 29.81 | 5.88E-02 | | 1.80E-01 |
| | | 1093.66 | 62.50 | 7.29E-03 | | 8.04E-02 |
| + | LU-173 | 100.72 | 5.24 | 1.63E-02 | 1.23E-01 | 3.48E-01 |
| | | 272.11 | 21.20 | 2.63E-02 | | 1.23E-01 |
| + | HF-175 | 343.40 | 84.00 | 6.99E-03 | 3.30E-02 | 3.30E-02 |
| + | LU-176 | 88.34 | 13.30 | 2.20E-02 | 2.87E-02 | 1.55E-01 |
| | | 201.83 | 86.00 | 5.69E-03 | | 2.91E-02 |
| | | 306.78 | 94.00 | -8.20E-03 | | 2.87E-02 |
| + | HF-181 | 133.02 | 41.70 | 2.10E-02 | 3.71E-02 | 4.76E-02 |
| | | 345.85 | 17.20 | 1.49E-02 | | 1.63E-01 |
| | | 482.03 | 82.80 | -5.85E-03 | | 3.71E-02 |
| + | TA-182 | 67.75 | 41.20 | -8.30E-02 | 5.45E-02 | 5.45E-02 |
| | | 1121.30 | 34.90 | 1.10E-01 | | 2.05E-01 |
| | | 1189.05 | 16.23 | -1.76E-01 | | 2.48E-01 |
| | | 1221.41 | 26.98 | -3.23E-02 | | 2.02E-01 |

Analysis Report for 1707087-02

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | TA-182 | 1231.02 | | 11.44 | 7.05E-02 | 5.45E-02 | 5.48E-01 |
| + | IR-192 | 308.46 | | 29.68 | 1.21E-02 | 6.98E-02 | 9.74E-02 |
| | | 468.07 | | 48.10 | -2.03E-02 | | 6.98E-02 |
| + | HG-203 | 279.19 | | 77.30 | 9.47E-03 | 3.38E-02 | 3.38E-02 |
| + | TL-204 | 374.74 | | 94.11 | -2.36E-03 | 3.12E-02 | 3.12E-02 |
| | | 899.15 | | 99.16 | 1.47E-02 | | 5.31E-02 |
| | | 911.74 | | 91.10 | -2.70E-03 | | 5.85E-02 |
| + | BI-207 | 569.67 | | 97.72 | -2.66E-03 | 3.81E-02 | 3.81E-02 |
| | | 1063.62 | | 74.90 | 6.59E-03 | | 6.43E-02 |
| + | TL-208 | 583.14 | | 30.22 | -1.21E-02 | 1.16E-01 | 1.16E-01 |
| | | 860.37 | | 4.48 | 3.45E-01 | | 1.13E+00 |
| | | 2614.66 | | 35.85 | 2.51E-01 | | 3.93E-01 |
| + | BI-210M | 262.00 | | 45.00 | -1.85E-02 | 5.63E-02 | 5.63E-02 |
| | | 300.00 | | 23.00 | 1.70E-02 | | 1.25E-01 |
| + | PB-210 | 46.50 | | 4.25 | 2.37E-01 | 7.00E-01 | 7.00E-01 |
| + | PB-211 | 404.84 | | 2.90 | -1.55E-01 | 9.53E-01 | 9.53E-01 |
| | | 831.96 | | 2.90 | -1.61E-01 | | 1.53E+00 |
| + | BI-212 | 727.17 | | 11.80 | -9.88E-02 | 4.10E-01 | 4.10E-01 |
| | | 1620.62 | | 2.75 | 4.59E-02 | | 2.41E+00 |
| + | PB-212 | 238.63 | | 44.60 | 3.67E-02 | 6.67E-02 | 6.67E-02 |
| | | 300.09 | | 3.41 | 1.15E-01 | | 8.42E-01 |
| + | BI-214 | 609.31 | * | 46.30 | 9.49E-02 | 8.70E-02 | 8.70E-02 |
| | | 1120.29 | | 15.10 | 2.19E-01 | | 4.73E-01 |
| | | 1764.49 | | 15.80 | 6.07E-02 | | 3.98E-01 |
| | | 2204.22 | | 4.98 | -1.22E-01 | | 8.95E-01 |
| + | PB-214 | 295.21 | | 19.19 | 8.46E-02 | 8.67E-02 | 1.63E-01 |
| | | 351.92 | | 37.19 | 1.99E-02 | | 8.67E-02 |
| + | RN-219 | 401.80 | | 6.50 | 6.55E-03 | 4.41E-01 | 4.41E-01 |
| + | RA-223 | 323.87 | | 3.88 | 1.29E-01 | 7.72E-01 | 7.72E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 4.85E-01 | 9.39E-01 | 9.39E-01 |
| + | RA-225 | 40.00 | | 31.00 | -3.93E-02 | 1.06E-01 | 1.06E-01 |
| + | RA-226 | 186.21 | | 3.28 | 7.44E-01 | 8.50E-01 | 8.50E-01 |
| + | TH-227 | 50.10 | | 8.40 | -7.43E-02 | 2.20E-01 | 2.93E-01 |
| | | 236.00 | | 11.50 | 4.87E-02 | | 2.20E-01 |
| | | 256.20 | | 6.30 | 2.29E-01 | | 4.82E-01 |
| + | AC-228 | 338.32 | | 11.40 | 3.50E-02 | 1.80E-01 | 2.78E-01 |
| | | 911.07 | | 27.70 | 1.19E-03 | | 1.80E-01 |
| | | 969.11 | | 16.60 | -7.87E-02 | | 2.81E-01 |
| + | TH-230 | 48.44 | | 16.90 | 1.20E-01 | 1.70E-01 | 1.70E-01 |
| | | 62.85 | | 4.60 | 5.90E-01 | | 5.76E-01 |
| | | 67.67 | | 0.37 | -9.24E+00 | | 6.06E+00 |
| + | PA-231 | 283.67 | | 1.60 | -3.17E-01 | 1.17E+00 | 1.71E+00 |
| | | 302.67 | | 2.30 | 3.64E-01 | | 1.17E+00 |
| + | TH-231 | 25.64 | | 14.70 | -4.30E-01 | 3.33E-01 | 6.67E-01 |
| | | 84.21 | | 6.40 | 1.62E-01 | | 3.33E-01 |
| + | PA-233 | 311.98 | | 38.60 | -8.43E-03 | 7.86E-02 | 7.86E-02 |
| + | PA-234 | 131.20 | | 20.40 | -3.16E-02 | 9.03E-02 | 9.03E-02 |
| | | 733.99 | | 8.80 | 5.40E-03 | | 5.26E-01 |

Analysis Report for 1707087-02

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | PA-234 | 946.00 | | 12.00 | 6.85E-02 | 9.03E-02 | 4.30E-01 |
| + | PA-234M | 1001.03 | * | 0.92 | 2.51E+00 | 8.47E-01 | 8.47E-01 |
| + | TH-234 | 63.29 | | 3.80 | 7.12E-01 | 6.95E-01 | 6.95E-01 |
| + | U-235 | 143.76 | | 10.50 | -2.69E-02 | 1.86E-01 | 1.86E-01 |
| | | 163.35 | | 4.70 | -1.27E-01 | | 4.48E-01 |
| | | 205.31 | | 4.70 | -7.70E-02 | | 5.11E-01 |
| + | NP-237 | 86.50 | | 12.60 | 1.34E-02 | 1.63E-01 | 1.63E-01 |
| + | NP-239 | 106.10 | | 22.70 | 5.53E-02 | 8.94E-02 | 8.94E-02 |
| | | 228.18 | | 10.70 | -6.65E-03 | | 2.32E-01 |
| | | 277.60 | | 14.10 | 3.31E-02 | | 1.94E-01 |
| + | AM-241 | 59.54 | | 35.90 | 1.19E-02 | 6.75E-02 | 6.75E-02 |
| + | AM-243 | 74.67 | | 66.00 | 2.40E-02 | 3.54E-02 | 3.54E-02 |
| + | CM-243 | 209.75 | | 3.29 | -1.24E-01 | 1.85E-01 | 7.38E-01 |
| | | 228.14 | | 10.60 | -6.38E-03 | | 2.23E-01 |
| | | 277.60 | | 14.00 | 3.16E-02 | | 1.85E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| BE-7 | 477.59 | 10.42 | 3.22E-01 | 3.22E-01 | -4.45E-02 | 1.43E-01 |
| NA-22 | 1274.54 | 99.94 | 5.02E-02 | 5.02E-02 | 9.10E-03 | 2.03E-02 |
| NA-24 | 1368.53 | 99.99 | 6.02E-02 | 2.64E-02 | 3.06E-04 | 2.39E-02 |
| | 2754.09 | 99.86 | 2.64E-02 | | 0.00E+00 | 0.00E+00 |
| AL-26 | 1808.65 | 99.76 | 6.46E-02 | 6.46E-02 | 9.85E-03 | 2.56E-02 |
| K-40 | 1460.81 | 10.67 | 5.31E-01 | 5.31E-01 | 1.13E-01 | 2.15E-01 |
| AR-41 | 1293.64 | 99.16 | 3.05E-01 | 3.05E-01 | 8.53E-02 | 1.29E-01 |

Analysis Report for 1707087-02

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| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TI-44 | 67.88 | | 94.40 | 2.37E-02 | 2.26E-02 | -3.62E-02 | 1.12E-02 |
| | | 78.34 | | 96.00 | 2.26E-02 | | -4.76E-04 | 1.07E-02 |
| | SC-46 | 889.25 | | 99.98 | 4.52E-02 | 4.52E-02 | -1.69E-02 | 1.91E-02 |
| | | 1120.51 | | 99.99 | 7.15E-02 | | 3.31E-02 | 3.14E-02 |
| | V-48 | 983.52 | | 99.98 | 4.53E-02 | 4.53E-02 | 6.07E-03 | 1.88E-02 |
| | | 1312.10 | | 97.50 | 5.67E-02 | | -2.34E-03 | 2.32E-02 |
| | CR-51 | 320.08 | | 9.83 | 3.06E-01 | 3.06E-01 | 3.85E-02 | 1.40E-01 |
| | MN-54 | 834.83 | | 99.97 | 4.61E-02 | 4.61E-02 | -9.08E-03 | 1.97E-02 |
| | CO-56 | 846.75 | | 99.96 | 5.15E-02 | 5.15E-02 | 3.72E-03 | 2.24E-02 |
| | | 1037.75 | | 14.03 | 4.40E-01 | | 1.27E-01 | 1.91E-01 |
| | | 1238.25 | | 67.00 | 9.04E-02 | | -1.30E-02 | 3.82E-02 |
| | | 1771.40 | | 15.51 | 2.89E-01 | | -1.40E-01 | 1.02E-01 |
| | | 2598.48 | | 16.90 | 5.77E-01 | | 2.20E-01 | 2.29E-01 |
| | CO-57 | 122.06 | | 85.51 | 2.07E-02 | 2.07E-02 | -3.20E-03 | 9.66E-03 |
| | | 136.48 | | 10.60 | 1.87E-01 | | 2.81E-02 | 8.76E-02 |
| | CO-58 | 810.76 | | 99.40 | 4.52E-02 | 4.52E-02 | -2.04E-02 | 1.93E-02 |
| | FE-59 | 1099.22 | | 56.50 | 1.12E-01 | 1.12E-01 | 4.48E-02 | 4.83E-02 |
| | | 1291.56 | | 43.20 | 1.52E-01 | | 3.09E-02 | 6.45E-02 |
| | CO-60 | 1173.22 | | 100.00 | 5.25E-02 | 4.85E-02 | -3.31E-03 | 2.18E-02 |
| | | 1332.49 | | 100.00 | 4.85E-02 | | 4.69E-03 | 1.93E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 1.09E-01 | 1.09E-01 | -3.12E-03 | 4.59E-02 |
| + | GA-67 | 93.31 | * | 35.70 | 8.64E-02 | 8.64E-02 | 7.90E-02 | 4.16E-02 |
| | | 208.95 | | 2.24 | 1.12E+00 | | -3.15E-01 | 5.21E-01 |
| | | 300.22 | | 16.00 | 1.86E-01 | | 2.54E-02 | 8.54E-02 |
| | SE-75 | 121.11 | | 16.70 | 1.08E-01 | 3.36E-02 | 7.03E-03 | 5.04E-02 |
| | | 136.00 | | 59.20 | 3.36E-02 | | 3.30E-03 | 1.58E-02 |
| | | 264.65 | | 59.80 | 3.94E-02 | | -2.68E-02 | 1.79E-02 |
| | | 279.53 | | 25.20 | 1.07E-01 | | 5.30E-02 | 4.93E-02 |
| | | 400.65 | | 11.40 | 2.40E-01 | | 1.37E-03 | 1.06E-01 |
| | RB-82 | 776.52 | | 13.00 | 2.81E-01 | 2.81E-01 | -2.12E-01 | 1.16E-01 |
| | RB-83 | 520.41 | | 46.00 | 7.40E-02 | 7.40E-02 | -2.89E-02 | 3.24E-02 |
| | | 529.64 | | 30.30 | 1.05E-01 | | -5.49E-02 | 4.55E-02 |
| | | 552.65 | | 16.40 | 2.26E-01 | | -4.79E-02 | 9.95E-02 |
| | KR-85 | 513.99 | | 0.43 | 1.28E+01 | 1.28E+01 | 4.20E-01 | 5.93E+00 |
| | SR-85 | 513.99 | | 99.27 | 5.62E-02 | 5.62E-02 | 1.84E-03 | 2.60E-02 |
| | Y-88 | 898.02 | | 93.40 | 5.64E-02 | 5.64E-02 | 1.88E-02 | 2.44E-02 |
| | | 1836.01 | | 99.38 | 7.08E-02 | | 0.00E+00 | 2.86E-02 |
| | MO-93 | 263.06 | | 56.72 | 4.44E-02 | 4.44E-02 | -5.50E-03 | 2.03E-02 |
| | | 684.67 | | 99.68 | 4.80E-02 | | 1.28E-03 | 2.12E-02 |
| | | 1477.11 | | 99.08 | 4.92E-02 | | -8.19E-03 | 1.91E-02 |
| | NB-93M | 16.57 | | 9.43 | 4.31E+00 | 4.31E+00 | 7.05E+00 | 2.06E+00 |
| | NB-94 | 702.63 | | 100.00 | 5.32E-02 | 4.79E-02 | -1.80E-02 | 2.38E-02 |
| | | 871.10 | | 100.00 | 4.79E-02 | | 1.80E-02 | 2.05E-02 |
| | NB-95 | 765.79 | | 99.81 | 4.84E-02 | 4.84E-02 | 1.70E-03 | 2.11E-02 |
| | NB-95M | 235.69 | | 25.00 | 1.05E-01 | 1.05E-01 | 2.31E-02 | 4.84E-02 |
| | ZR-95 | 724.18 | | 43.70 | 1.23E-01 | 8.63E-02 | 7.85E-02 | 5.49E-02 |
| | | 756.72 | | 55.30 | 8.63E-02 | | 4.05E-02 | 3.77E-02 |
| | MO-99 | 181.06 | | 6.20 | 3.67E-01 | 3.67E-01 | -4.64E-01 | 1.71E-01 |
| | | 739.58 | | 12.80 | 3.70E-01 | | 8.33E-03 | 1.61E-01 |
| | | 778.00 | | 4.50 | 9.66E-01 | | -5.06E-01 | 4.11E-01 |
| | RU-103 | 497.08 | | 89.00 | 3.84E-02 | 3.84E-02 | -5.28E-04 | 1.70E-02 |
| | RU-106 | 621.84 | | 9.80 | 3.69E-01 | 3.69E-01 | 1.03E-01 | 1.59E-01 |
| | AG-108M | 433.93 | | 89.90 | 2.80E-02 | 2.80E-02 | -3.98E-03 | 1.20E-02 |

Analysis Report for 1707087-02

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| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| AG-108M | 614.37 | 90.40 | 4.44E-02 | 2.80E-02 | -5.50E-03 | 1.94E-02 |
| | 722.95 | 90.50 | 5.69E-02 | | 1.68E-02 | 2.52E-02 |
| CD-109 | 88.03 | 3.72 | 5.53E-01 | 5.53E-01 | 7.86E-02 | 2.62E-01 |
| AG-110M | 657.75 | 93.14 | 4.60E-02 | 4.60E-02 | -1.55E-02 | 2.02E-02 |
| | 677.61 | 10.53 | 4.50E-01 | | 2.49E-02 | 1.99E-01 |
| | 706.67 | 16.46 | 3.31E-01 | | 1.16E-01 | 1.48E-01 |
| | 763.93 | 21.98 | 1.93E-01 | | 1.28E-03 | 8.27E-02 |
| | 884.67 | 71.63 | 8.47E-02 | | 3.64E-02 | 3.75E-02 |
| | 1384.27 | 23.94 | 2.10E-01 | | -5.44E-02 | 8.32E-02 |
| CD-113M | 263.70 | 0.02 | 1.12E+02 | 1.12E+02 | 1.22E+01 | 5.15E+01 |
| SN-113 | 255.12 | 1.93 | 1.53E+00 | 4.65E-02 | 7.92E-01 | 7.14E-01 |
| | 391.69 | 64.90 | 4.65E-02 | | 6.09E-04 | 2.08E-02 |
| TE123M | 159.00 | 84.10 | 2.43E-02 | 2.43E-02 | -2.18E-03 | 1.13E-02 |
| SB-124 | 602.71 | 97.87 | 3.34E-02 | 3.34E-02 | -4.60E-03 | 1.42E-02 |
| | 645.85 | 7.26 | 5.00E-01 | | -1.66E-02 | 2.14E-01 |
| | 722.78 | 11.10 | 4.64E-01 | | 1.37E-01 | 2.06E-01 |
| | 1691.02 | 49.00 | 1.01E-01 | | -3.66E-02 | 3.79E-02 |
| I-125 | 35.49 | 6.49 | 6.41E-01 | 6.41E-01 | -1.64E-01 | 3.02E-01 |
| SB-125 | 176.33 | 6.89 | 3.03E-01 | 8.99E-02 | -1.28E-01 | 1.41E-01 |
| | 427.89 | 29.33 | 8.99E-02 | | -2.13E-02 | 3.91E-02 |
| | 463.38 | 10.35 | 3.27E-01 | | -1.21E-02 | 1.46E-01 |
| | 600.56 | 17.80 | 2.03E-01 | | 1.15E-02 | 8.76E-02 |
| | 635.90 | 11.32 | 3.15E-01 | | -7.39E-02 | 1.35E-01 |
| SB-126 | 414.70 | 83.30 | 4.08E-02 | 4.08E-02 | 8.16E-03 | 1.84E-02 |
| | 666.33 | 99.60 | 5.40E-02 | | 1.80E-02 | 2.43E-02 |
| | 695.00 | 99.60 | 5.53E-02 | | -1.13E-03 | 2.48E-02 |
| | 720.50 | 53.80 | 9.42E-02 | | 3.61E-02 | 4.17E-02 |
| SN-126 | 87.57 | 37.00 | 5.56E-02 | 5.56E-02 | 7.91E-03 | 2.63E-02 |
| SB-127 | 473.00 | 25.00 | 1.43E-01 | 1.38E-01 | -4.74E-02 | 6.35E-02 |
| | 685.20 | 35.70 | 1.38E-01 | | 3.68E-03 | 6.12E-02 |
| | 783.80 | 14.70 | 3.45E-01 | | 4.46E-02 | 1.51E-01 |
| I-129 | 29.78 | 57.00 | 1.19E-01 | 1.19E-01 | 2.39E-02 | 5.64E-02 |
| | 33.60 | 13.20 | 3.73E-01 | | -2.37E-02 | 1.77E-01 |
| | 39.58 | 7.52 | 4.42E-01 | | -1.63E-01 | 2.08E-01 |
| I-131 | 284.30 | 6.05 | 4.61E-01 | 3.97E-02 | -8.52E-02 | 2.12E-01 |
| | 364.48 | 81.20 | 3.97E-02 | | -5.48E-03 | 1.80E-02 |
| | 636.97 | 7.26 | 4.99E-01 | | -2.09E-01 | 2.14E-01 |
| | 722.89 | 1.80 | 2.90E+00 | | 8.57E-01 | 1.29E+00 |
| TE-132 | 49.72 | 13.10 | 1.96E-01 | 2.79E-02 | -4.99E-02 | 9.24E-02 |
| | 228.16 | 88.00 | 2.79E-02 | | -7.97E-04 | 1.29E-02 |
| BA-133 | 81.00 | 33.00 | 6.22E-02 | 4.47E-02 | -3.46E-02 | 2.94E-02 |
| | 302.84 | 17.80 | 1.51E-01 | | 4.71E-02 | 6.89E-02 |
| | 356.01 | 60.00 | 4.47E-02 | | -3.67E-02 | 2.00E-02 |
| I-133 | 529.87 | 86.30 | 4.24E-02 | 4.24E-02 | -2.21E-02 | 1.83E-02 |
| XE-133 | 81.00 | 38.00 | 5.53E-02 | 5.53E-02 | -3.07E-02 | 2.62E-02 |
| CS-134 | 563.23 | 8.38 | 4.16E-01 | 3.94E-02 | -2.07E-01 | 1.81E-01 |
| | 569.32 | 15.43 | 2.41E-01 | | -1.69E-02 | 1.06E-01 |
| | 604.70 | 97.60 | 3.94E-02 | | 9.24E-04 | 1.72E-02 |
| | 795.84 | 85.40 | 5.34E-02 | | 1.66E-02 | 2.30E-02 |
| | 801.93 | 8.73 | 6.35E-01 | | 1.66E-01 | 2.81E-01 |
| CS-135 | 268.24 | 16.00 | 1.60E-01 | 1.60E-01 | 6.38E-03 | 7.35E-02 |
| I-135 | 1131.51 | 22.50 | 3.50E-01 | 1.40E-01 | -5.97E-02 | 1.45E-01 |
| | 1260.41 | 28.60 | 1.40E-01 | | -3.81E-02 | 4.43E-02 |

Analysis Report for 1707087-02

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| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| I-135 | 1678.03 | 9.54 | 7.97E-01 | 1.40E-01 | 3.29E-02 | 2.98E-01 |
| CS-136 | 153.22 | 7.46 | 2.73E-01 | 3.86E-02 | -2.38E-02 | 1.27E-01 |
| | 163.89 | 4.61 | 4.78E-01 | | 5.29E-02 | 2.24E-01 |
| | 176.55 | 13.56 | 1.50E-01 | | -9.74E-02 | 6.98E-02 |
| | 273.65 | 12.66 | 1.94E-01 | | -4.45E-02 | 8.83E-02 |
| | 340.57 | 48.50 | 6.56E-02 | | 4.52E-02 | 3.00E-02 |
| | 818.50 | 99.70 | 3.86E-02 | | 1.67E-02 | 1.60E-02 |
| | 1048.07 | 79.60 | 7.41E-02 | | 2.98E-02 | 3.19E-02 |
| | 1235.34 | 19.70 | 2.66E-01 | | -5.15E-02 | 1.09E-01 |
| CS-137 | 661.65 | 85.12 | 5.90E-02 | 5.90E-02 | 1.20E-02 | 2.64E-02 |
| LA-138 | 788.74 | 34.00 | 1.29E-01 | 9.51E-02 | 1.54E-02 | 5.50E-02 |
| | 1435.80 | 66.00 | 9.51E-02 | | 3.25E-02 | 3.94E-02 |
| CE-139 | 165.85 | 80.35 | 2.85E-02 | 2.85E-02 | 7.57E-03 | 1.34E-02 |
| BA-140 | 162.64 | 6.70 | 3.16E-01 | 1.49E-01 | -8.99E-02 | 1.48E-01 |
| | 304.84 | 4.50 | 5.67E-01 | | -3.56E-01 | 2.57E-01 |
| | 423.70 | 3.20 | 9.75E-01 | | 3.56E-01 | 4.34E-01 |
| | 437.55 | 2.00 | 1.48E+00 | | 1.57E-01 | 6.49E-01 |
| | 537.32 | 25.00 | 1.49E-01 | | -1.94E-02 | 6.57E-02 |
| LA-140 | 328.77 | 20.50 | 1.57E-01 | 6.92E-02 | 3.34E-02 | 7.20E-02 |
| | 487.03 | 45.50 | 8.07E-02 | | 1.20E-02 | 3.60E-02 |
| | 815.85 | 23.50 | 1.71E-01 | | 4.63E-02 | 7.18E-02 |
| | 1596.49 | 95.49 | 6.92E-02 | | 4.61E-03 | 2.84E-02 |
| CE-141 | 145.44 | 48.40 | 4.13E-02 | 4.13E-02 | 6.44E-03 | 1.93E-02 |
| CE-143 | 57.36 | 11.80 | 1.94E-01 | 7.37E-02 | -7.84E-03 | 9.09E-02 |
| | 293.26 | 42.00 | 7.37E-02 | | -3.54E-02 | 3.38E-02 |
| | 664.55 | 5.20 | 1.04E+00 | | -3.87E-01 | 4.63E-01 |
| CE-144 | 133.54 | 10.80 | 1.82E-01 | 1.82E-01 | 8.29E-02 | 8.56E-02 |
| PM-144 | 476.78 | 42.00 | 7.78E-02 | 3.76E-02 | -3.05E-02 | 3.43E-02 |
| | 618.01 | 98.60 | 3.76E-02 | | -6.41E-03 | 1.63E-02 |
| | 696.49 | 99.49 | 5.77E-02 | | 2.71E-02 | 2.60E-02 |
| PM-145 | 36.85 | 21.70 | 1.81E-01 | 9.67E-02 | 6.02E-02 | 8.55E-02 |
| | 37.36 | 39.70 | 9.67E-02 | | 3.21E-02 | 4.56E-02 |
| | 42.30 | 15.10 | 2.03E-01 | | -2.54E-01 | 9.57E-02 |
| | 72.40 | 2.31 | 1.02E+00 | | 3.69E-01 | 4.86E-01 |
| PM-146 | 453.90 | 39.94 | 8.13E-02 | 8.13E-02 | 3.14E-03 | 3.61E-02 |
| | 735.90 | 14.01 | 3.31E-01 | | 3.89E-02 | 1.45E-01 |
| | 747.13 | 13.10 | 2.94E-01 | | -1.08E-01 | 1.24E-01 |
| ND-147 | 91.11 | 28.90 | 8.12E-02 | 8.12E-02 | -4.96E-03 | 3.87E-02 |
| | 531.02 | 13.10 | 2.81E-01 | | 3.19E-02 | 1.24E-01 |
| PM-149 | 285.90 | 3.10 | 9.72E-01 | 9.72E-01 | 2.44E-01 | 4.47E-01 |
| EU-152 | 121.78 | 20.50 | 8.62E-02 | 8.62E-02 | -1.33E-02 | 4.02E-02 |
| | 244.69 | 5.40 | 5.18E-01 | | 7.36E-02 | 2.41E-01 |
| | 344.27 | 19.13 | 1.45E-01 | | 3.07E-02 | 6.54E-02 |
| | 778.89 | 9.20 | 4.70E-01 | | 8.94E-02 | 2.01E-01 |
| | 964.01 | 10.40 | 5.39E-01 | | 0.00E+00 | 2.33E-01 |
| | 1085.78 | 7.22 | 6.04E-01 | | -1.82E-01 | 2.44E-01 |
| | 1112.02 | 9.60 | 4.31E-01 | | -1.32E-01 | 1.71E-01 |
| | 1407.95 | 14.94 | 3.41E-01 | | 1.73E-02 | 1.35E-01 |
| GD-153 | 97.43 | 31.30 | 6.53E-02 | 6.53E-02 | 1.22E-03 | 3.09E-02 |
| | 103.18 | 22.20 | 8.21E-02 | | 3.06E-03 | 3.85E-02 |
| EU-154 | 123.07 | 40.50 | 4.53E-02 | 4.53E-02 | 4.03E-04 | 2.12E-02 |
| | 723.30 | 19.70 | 2.72E-01 | | 1.74E-01 | 1.21E-01 |
| | 873.19 | 11.50 | 4.02E-01 | | 1.12E-01 | 1.71E-01 |

Analysis Report for 1707087-02

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| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| EU-154 | 996.32 | 10.30 | 3.34E-01 | 4.53E-02 | 0.00E+00 | 1.30E-01 |
| | 1004.76 | 17.90 | 2.81E-01 | | -7.26E-02 | 1.19E-01 |
| | 1274.45 | 35.50 | 1.41E-01 | | 2.56E-02 | 5.71E-02 |
| EU-155 | 86.50 | 30.90 | 6.66E-02 | 6.66E-02 | 5.47E-03 | 3.15E-02 |
| | 105.30 | 20.70 | 9.00E-02 | | 8.69E-03 | 4.23E-02 |
| EU-156 | 811.77 | 10.40 | 4.65E-01 | 4.65E-01 | 5.12E-02 | 2.01E-01 |
| | 1153.47 | 7.20 | 6.44E-01 | | 9.64E-02 | 2.60E-01 |
| | 1230.71 | 8.90 | 6.51E-01 | | 6.08E-02 | 2.73E-01 |
| HO-166M | 184.41 | 72.60 | 3.78E-02 | 3.78E-02 | 3.11E-02 | 1.78E-02 |
| | 280.45 | 29.60 | 8.96E-02 | | 6.45E-03 | 4.10E-02 |
| | 410.94 | 11.10 | 2.91E-01 | | 3.00E-02 | 1.30E-01 |
| | 711.69 | 54.10 | 8.97E-02 | | 2.24E-02 | 3.95E-02 |
| TM-171 | 66.72 | 0.14 | 1.75E+01 | 1.75E+01 | -3.11E+00 | 8.36E+00 |
| HF-172 | 67.35 | 5.31 | 4.61E-01 | 1.51E-01 | -8.17E-02 | 2.19E-01 |
| | 125.81 | 11.30 | 1.51E-01 | | -9.96E-02 | 7.01E-02 |
| LU-172 | 181.53 | 20.60 | 1.13E-01 | 8.04E-02 | -1.02E-01 | 5.30E-02 |
| | 900.72 | 29.81 | 1.80E-01 | | 5.88E-02 | 7.79E-02 |
| | 1093.66 | 62.50 | 8.04E-02 | | 7.29E-03 | 3.34E-02 |
| LU-173 | 100.72 | 5.24 | 3.48E-01 | 1.23E-01 | 1.63E-02 | 1.64E-01 |
| | 272.11 | 21.20 | 1.23E-01 | | 2.63E-02 | 5.63E-02 |
| HF-175 | 343.40 | 84.00 | 3.30E-02 | 3.30E-02 | 6.99E-03 | 1.49E-02 |
| LU-176 | 88.34 | 13.30 | 1.55E-01 | 2.87E-02 | 2.20E-02 | 7.32E-02 |
| | 201.83 | 86.00 | 2.91E-02 | | 5.69E-03 | 1.36E-02 |
| | 306.78 | 94.00 | 2.87E-02 | | -8.20E-03 | 1.30E-02 |
| HF-181 | 133.02 | 41.70 | 4.76E-02 | 3.71E-02 | 2.10E-02 | 2.23E-02 |
| | 345.85 | 17.20 | 1.63E-01 | | 1.49E-02 | 7.33E-02 |
| | 482.03 | 82.80 | 3.71E-02 | | -5.85E-03 | 1.62E-02 |
| TA-182 | 67.75 | 41.20 | 5.45E-02 | 5.45E-02 | -8.30E-02 | 2.58E-02 |
| | 1121.30 | 34.90 | 2.05E-01 | | 1.10E-01 | 9.01E-02 |
| | 1189.05 | 16.23 | 2.48E-01 | | -1.76E-01 | 9.61E-02 |
| | 1221.41 | 26.98 | 2.02E-01 | | -3.23E-02 | 8.37E-02 |
| | 1231.02 | 11.44 | 5.48E-01 | | 7.05E-02 | 2.33E-01 |
| IR-192 | 308.46 | 29.68 | 9.74E-02 | 6.98E-02 | 1.21E-02 | 4.45E-02 |
| | 468.07 | 48.10 | 6.98E-02 | | -2.03E-02 | 3.10E-02 |
| HG-203 | 279.19 | 77.30 | 3.38E-02 | 3.38E-02 | 9.47E-03 | 1.55E-02 |
| TL-204 | 374.74 | 94.11 | 3.12E-02 | 3.12E-02 | -2.36E-03 | 1.40E-02 |
| | 899.15 | 99.16 | 5.31E-02 | | 1.47E-02 | 2.30E-02 |
| | 911.74 | 91.10 | 5.85E-02 | | -2.70E-03 | 2.53E-02 |
| BI-207 | 569.67 | 97.72 | 3.81E-02 | 3.81E-02 | -2.66E-03 | 1.67E-02 |
| | 1063.62 | 74.90 | 6.43E-02 | | 6.59E-03 | 2.67E-02 |
| TL-208 | 583.14 | 30.22 | 1.16E-01 | 1.16E-01 | -1.21E-02 | 5.01E-02 |
| | 860.37 | 4.48 | 1.13E+00 | | 3.45E-01 | 4.89E-01 |
| | 2614.66 | 35.85 | 3.93E-01 | | 2.51E-01 | 1.68E-01 |
| BI-210M | 262.00 | 45.00 | 5.63E-02 | 5.63E-02 | -1.85E-02 | 2.58E-02 |
| | 300.00 | 23.00 | 1.25E-01 | | 1.70E-02 | 5.72E-02 |
| PB-210 | 46.50 | 4.25 | 7.00E-01 | 7.00E-01 | 2.37E-01 | 3.31E-01 |
| PB-211 | 404.84 | 2.90 | 9.53E-01 | 9.53E-01 | -1.55E-01 | 4.20E-01 |
| | 831.96 | 2.90 | 1.53E+00 | | -1.61E-01 | 6.49E-01 |
| BI-212 | 727.17 | 11.80 | 4.10E-01 | 4.10E-01 | -9.88E-02 | 1.80E-01 |
| | 1620.62 | 2.75 | 2.41E+00 | | 4.59E-02 | 9.89E-01 |
| PB-212 | 238.63 | 44.60 | 6.67E-02 | 6.67E-02 | 3.67E-02 | 3.12E-02 |
| | 300.09 | 3.41 | 8.42E-01 | | 1.15E-01 | 3.86E-01 |
| + BI-214 | 609.31 * | 46.30 | 8.70E-02 | 8.70E-02 | 9.49E-02 | 3.82E-02 |

Analysis Report for 1707087-02

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| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BI-214 | 1120.29 | | 15.10 | 4.73E-01 | 8.70E-02 | 2.19E-01 | 2.08E-01 |
| | | 1764.49 | | 15.80 | 3.98E-01 | | 6.07E-02 | 1.58E-01 |
| | | 2204.22 | | 4.98 | 8.95E-01 | | -1.22E-01 | 2.83E-01 |
| | PB-214 | 295.21 | | 19.19 | 1.63E-01 | 8.67E-02 | 8.46E-02 | 7.52E-02 |
| | | 351.92 | | 37.19 | 8.67E-02 | | 1.99E-02 | 3.96E-02 |
| | RN-219 | 401.80 | | 6.50 | 4.41E-01 | 4.41E-01 | 6.55E-03 | 1.96E-01 |
| | RA-223 | 323.87 | | 3.88 | 7.72E-01 | 7.72E-01 | 1.29E-01 | 3.53E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 9.39E-01 | 9.39E-01 | 4.85E-01 | 4.45E-01 |
| | RA-225 | 40.00 | | 31.00 | 1.06E-01 | 1.06E-01 | -3.93E-02 | 5.01E-02 |
| | RA-226 | 186.21 | | 3.28 | 8.50E-01 | 8.50E-01 | 7.44E-01 | 4.02E-01 |
| | TH-227 | 50.10 | | 8.40 | 2.93E-01 | 2.20E-01 | -7.43E-02 | 1.38E-01 |
| | | 236.00 | | 11.50 | 2.20E-01 | | 4.87E-02 | 1.02E-01 |
| | | 256.20 | | 6.30 | 4.82E-01 | | 2.29E-01 | 2.25E-01 |
| | AC-228 | 338.32 | | 11.40 | 2.78E-01 | 1.80E-01 | 3.50E-02 | 1.27E-01 |
| | | 911.07 | | 27.70 | 1.80E-01 | | 1.19E-03 | 7.70E-02 |
| | | 969.11 | | 16.60 | 2.81E-01 | | -7.87E-02 | 1.18E-01 |
| | TH-230 | 48.44 | | 16.90 | 1.70E-01 | 1.70E-01 | 1.20E-01 | 8.07E-02 |
| | | 62.85 | | 4.60 | 5.76E-01 | | 5.90E-01 | 2.75E-01 |
| | | 67.67 | | 0.37 | 6.06E+00 | | -9.24E+00 | 2.87E+00 |
| | PA-231 | 283.67 | | 1.60 | 1.71E+00 | 1.17E+00 | -3.17E-01 | 7.86E-01 |
| | | 302.67 | | 2.30 | 1.17E+00 | | 3.64E-01 | 5.33E-01 |
| | TH-231 | 25.64 | | 14.70 | 6.67E-01 | 3.33E-01 | -4.30E-01 | 3.17E-01 |
| | | 84.21 | | 6.40 | 3.33E-01 | | 1.62E-01 | 1.58E-01 |
| | PA-233 | 311.98 | | 38.60 | 7.86E-02 | 7.86E-02 | -8.43E-03 | 3.60E-02 |
| | PA-234 | 131.20 | | 20.40 | 9.03E-02 | 9.03E-02 | -3.16E-02 | 4.22E-02 |
| | | 733.99 | | 8.80 | 5.26E-01 | | 5.40E-03 | 2.30E-01 |
| | | 946.00 | | 12.00 | 4.30E-01 | | 6.85E-02 | 1.84E-01 |
| + | PA-234M | 1001.03 | * | 0.92 | 8.47E-01 | 8.47E-01 | 2.51E+00 | 0.00E+00 |
| | TH-234 | 63.29 | | 3.80 | 6.95E-01 | 6.95E-01 | 7.12E-01 | 3.31E-01 |
| | U-235 | 143.76 | | 10.50 | 1.86E-01 | 1.86E-01 | -2.69E-02 | 8.68E-02 |
| | | 163.35 | | 4.70 | 4.48E-01 | | -1.27E-01 | 2.09E-01 |
| | | 205.31 | | 4.70 | 5.11E-01 | | -7.70E-02 | 2.38E-01 |
| | NP-237 | 86.50 | | 12.60 | 1.63E-01 | 1.63E-01 | 1.34E-02 | 7.73E-02 |
| | NP-239 | 106.10 | | 22.70 | 8.94E-02 | 8.94E-02 | 5.53E-02 | 4.21E-02 |
| | | 228.18 | | 10.70 | 2.32E-01 | | -6.65E-03 | 1.07E-01 |
| | | 277.60 | | 14.10 | 1.94E-01 | | 3.31E-02 | 8.86E-02 |
| | AM-241 | 59.54 | | 35.90 | 6.75E-02 | 6.75E-02 | 1.19E-02 | 3.20E-02 |
| | AM-243 | 74.67 | | 66.00 | 3.54E-02 | 3.54E-02 | 2.40E-02 | 1.69E-02 |
| | CM-243 | 209.75 | | 3.29 | 7.38E-01 | 1.85E-01 | -1.24E-01 | 3.43E-01 |
| | | 228.14 | | 10.60 | 2.23E-01 | | -6.38E-03 | 1.03E-01 |
| | | 277.60 | | 14.00 | 1.85E-01 | | 3.16E-02 | 8.48E-02 |

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

Analysis Report for 1707087-02

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No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: BLANK

Elapsed Live time: 3600
Elapsed Real Time: 3613

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 44 |
| 17: | 48 | 31 | 39 | 23 | 26 | 21 | 21 | 31 |
| 25: | 9 | 16 | 13 | 22 | 24 | 24 | 14 | 14 |
| 33: | 14 | 14 | 13 | 16 | 12 | 11 | 16 | 9 |
| 41: | 10 | 12 | 12 | 19 | 26 | 28 | 12 | 6 |
| 49: | 5 | 15 | 13 | 7 | 15 | 4 | 10 | 7 |
| 57: | 8 | 18 | 17 | 8 | 18 | 38 | 34 | 16 |
| 65: | 17 | 12 | 12 | 26 | 18 | 12 | 20 | 22 |
| 73: | 13 | 22 | 20 | 18 | 18 | 13 | 12 | 14 |
| 81: | 18 | 15 | 15 | 19 | 19 | 15 | 13 | 13 |
| 89: | 13 | 15 | 21 | 34 | 29 | 14 | 14 | 13 |
| 97: | 11 | 12 | 11 | 8 | 8 | 15 | 16 | 10 |
| 105: | 12 | 12 | 10 | 14 | 11 | 7 | 10 | 15 |
| 113: | 9 | 5 | 13 | 9 | 9 | 6 | 10 | 12 |
| 121: | 16 | 10 | 7 | 6 | 11 | 12 | 12 | 2 |
| 129: | 11 | 11 | 8 | 13 | 11 | 9 | 15 | 10 |
| 137: | 9 | 10 | 12 | 10 | 9 | 9 | 12 | 9 |
| 145: | 13 | 7 | 16 | 5 | 9 | 9 | 8 | 11 |
| 153: | 10 | 8 | 13 | 12 | 8 | 10 | 9 | 8 |
| 161: | 6 | 12 | 9 | 12 | 12 | 14 | 13 | 7 |
| 169: | 13 | 10 | 17 | 10 | 8 | 6 | 6 | 8 |
| 177: | 10 | 11 | 6 | 11 | 8 | 9 | 7 | 17 |
| 185: | 27 | 14 | 16 | 10 | 6 | 8 | 11 | 13 |
| 193: | 16 | 7 | 8 | 11 | 7 | 11 | 13 | 11 |
| 201: | 5 | 7 | 13 | 9 | 10 | 7 | 10 | 8 |
| 209: | 7 | 11 | 7 | 10 | 9 | 10 | 13 | 8 |
| 217: | 7 | 9 | 9 | 6 | 9 | 8 | 6 | 8 |
| 225: | 10 | 6 | 7 | 8 | 6 | 3 | 8 | 6 |
| 233: | 4 | 9 | 4 | 1 | 16 | 12 | 13 | 11 |
| 241: | 15 | 9 | 6 | 5 | 8 | 9 | 8 | 5 |
| 249: | 9 | 5 | 2 | 10 | 12 | 11 | 6 | 10 |
| 257: | 11 | 5 | 5 | 12 | 6 | 3 | 5 | 6 |
| 265: | 4 | 7 | 4 | 8 | 7 | 5 | 7 | 7 |
| 273: | 4 | 3 | 2 | 7 | 7 | 3 | 6 | 11 |
| 281: | 3 | 5 | 5 | 4 | 8 | 6 | 9 | 8 |
| 289: | 2 | 5 | 4 | 8 | 10 | 6 | 7 | 12 |
| 297: | 4 | 2 | 9 | 4 | 7 | 3 | 6 | 3 |
| 305: | 3 | 6 | 2 | 9 | 5 | 7 | 7 | 3 |
| 313: | 8 | 3 | 7 | 9 | 9 | 2 | 3 | 6 |
| 321: | 2 | 8 | 4 | 6 | 5 | 7 | 8 | 5 |
| 329: | 6 | 9 | 2 | 7 | 3 | 6 | 5 | 1 |
| 337: | 8 | 6 | 6 | 7 | 4 | 6 | 1 | 3 |
| 345: | 1 | 6 | 7 | 4 | 9 | 3 | 11 | 6 |
| 353: | 2 | 2 | 4 | 2 | 4 | 4 | 5 | 7 |
| 361: | 10 | 1 | 4 | 3 | 6 | 4 | 5 | 5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 5 | 3 | 5 | 3 | 5 | 4 | 4 | 2 |

Sample Title: BLANK

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 3 | 4 | 4 | 3 | 3 | 5 | 2 | 6 |
| 385: | 4 | 4 | 5 | 7 | 4 | 2 | 3 | 4 |
| 393: | 2 | 3 | 2 | 4 | 3 | 3 | 4 | 3 |
| 401: | 1 | 2 | 3 | 5 | 0 | 5 | 3 | 4 |
| 409: | 2 | 6 | 2 | 6 | 3 | 2 | 6 | 2 |
| 417: | 7 | 3 | 2 | 7 | 1 | 2 | 3 | 4 |
| 425: | 4 | 1 | 2 | 1 | 1 | 2 | 4 | 2 |
| 433: | 0 | 1 | 2 | 2 | 3 | 3 | 5 | 2 |
| 441: | 4 | 3 | 5 | 4 | 4 | 7 | 5 | 6 |
| 449: | 3 | 4 | 3 | 5 | 3 | 2 | 3 | 1 |
| 457: | 3 | 1 | 3 | 3 | 4 | 5 | 3 | 2 |
| 465: | 5 | 0 | 5 | 3 | 6 | 0 | 4 | 4 |
| 473: | 2 | 4 | 2 | 5 | 4 | 2 | 0 | 3 |
| 481: | 5 | 2 | 2 | 2 | 1 | 6 | 3 | 7 |
| 489: | 2 | 4 | 0 | 3 | 2 | 1 | 3 | 2 |
| 497: | 5 | 3 | 3 | 5 | 3 | 0 | 0 | 3 |
| 505: | 3 | 2 | 6 | 3 | 15 | 17 | 19 | 4 |
| 513: | 4 | 0 | 7 | 1 | 2 | 5 | 4 | 2 |
| 521: | 4 | 0 | 0 | 5 | 2 | 1 | 0 | 2 |
| 529: | 2 | 3 | 4 | 2 | 6 | 1 | 6 | 2 |
| 537: | 2 | 2 | 3 | 3 | 2 | 3 | 4 | 5 |
| 545: | 2 | 2 | 2 | 5 | 3 | 1 | 2 | 2 |
| 553: | 2 | 4 | 4 | 0 | 6 | 3 | 1 | 1 |
| 561: | 7 | 2 | 0 | 2 | 2 | 2 | 4 | 3 |
| 569: | 4 | 1 | 2 | 1 | 5 | 1 | 5 | 3 |
| 577: | 1 | 1 | 1 | 1 | 3 | 4 | 0 | 2 |
| 585: | 3 | 5 | 2 | 1 | 3 | 0 | 7 | 7 |
| 593: | 1 | 2 | 3 | 2 | 5 | 1 | 2 | 1 |
| 601: | 1 | 3 | 1 | 2 | 1 | 3 | 5 | 3 |
| 609: | 5 | 5 | 4 | 6 | 0 | 1 | 2 | 2 |
| 617: | 2 | 2 | 2 | 3 | 1 | 3 | 0 | 2 |
| 625: | 0 | 1 | 2 | 0 | 2 | 2 | 4 | 4 |
| 633: | 0 | 2 | 1 | 4 | 0 | 1 | 4 | 0 |
| 641: | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 1 |
| 649: | 2 | 2 | 1 | 4 | 0 | 0 | 2 | 1 |
| 657: | 4 | 2 | 3 | 2 | 3 | 4 | 2 | 1 |
| 665: | 3 | 1 | 4 | 3 | 5 | 4 | 3 | 0 |
| 673: | 1 | 5 | 1 | 2 | 2 | 1 | 6 | 2 |
| 681: | 0 | 4 | 1 | 4 | 4 | 1 | 2 | 2 |
| 689: | 2 | 0 | 5 | 1 | 2 | 2 | 4 | 5 |
| 697: | 4 | 3 | 5 | 3 | 0 | 2 | 1 | 5 |
| 705: | 4 | 1 | 3 | 3 | 4 | 2 | 3 | 1 |
| 713: | 1 | 2 | 0 | 2 | 0 | 1 | 2 | 2 |
| 721: | 5 | 1 | 3 | 4 | 2 | 1 | 3 | 1 |
| 729: | 1 | 2 | 2 | 2 | 0 | 2 | 2 | 1 |
| 737: | 4 | 0 | 3 | 2 | 1 | 1 | 1 | 3 |
| 745: | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 4 |
| 753: | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 0 |
| 761: | 1 | 1 | 0 | 1 | 2 | 1 | 4 | 1 |
| 769: | 5 | 2 | 5 | 0 | 1 | 0 | 0 | 1 |
| 777: | 4 | 0 | 2 | 0 | 3 | 2 | 2 | 1 |
| 785: | 2 | 1 | 3 | 1 | 1 | 1 | 2 | 0 |
| 793: | 0 | 1 | 2 | 2 | 1 | 3 | 2 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 0 | 3 | 3 | 2 | 5 | 1 | 1 | 5 |

Sample Title: BLANK

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 1 | 0 | 1 | 0 | 1 | 2 | 3 | 0 |
| 817: | 0 | 1 | 1 | 1 | 0 | 0 | 4 | 2 |
| 825: | 2 | 0 | 0 | 1 | 2 | 0 | 1 | 1 |
| 833: | 2 | 2 | 2 | 0 | 4 | 0 | 3 | 1 |
| 841: | 2 | 2 | 2 | 1 | 0 | 2 | 2 | 3 |
| 849: | 1 | 2 | 2 | 1 | 1 | 3 | 0 | 2 |
| 857: | 1 | 2 | 2 | 3 | 1 | 2 | 1 | 0 |
| 865: | 0 | 1 | 1 | 1 | 1 | 3 | 2 | 1 |
| 873: | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 2 |
| 881: | 2 | 3 | 3 | 3 | 2 | 3 | 1 | 1 |
| 889: | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 3 |
| 897: | 3 | 0 | 2 | 2 | 1 | 2 | 1 | 0 |
| 905: | 1 | 0 | 2 | 1 | 1 | 4 | 0 | 2 |
| 913: | 2 | 0 | 2 | 2 | 3 | 1 | 0 | 0 |
| 921: | 2 | 3 | 2 | 1 | 6 | 1 | 3 | 1 |
| 929: | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 3 |
| 937: | 1 | 1 | 1 | 1 | 2 | 4 | 1 | 1 |
| 945: | 0 | 0 | 1 | 0 | 3 | 1 | 1 | 2 |
| 953: | 0 | 2 | 0 | 2 | 1 | 3 | 3 | 4 |
| 961: | 1 | 2 | 0 | 0 | 1 | 2 | 1 | 0 |
| 969: | 2 | 1 | 1 | 1 | 2 | 2 | 0 | 0 |
| 977: | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 1 |
| 985: | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 2 |
| 993: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1001: | 4 | 3 | 0 | 0 | 0 | 1 | 0 | 2 |
| 1009: | 2 | 1 | 0 | 1 | 2 | 3 | 0 | 0 |
| 1017: | 3 | 1 | 1 | 3 | 0 | 2 | 0 | 0 |
| 1025: | 2 | 1 | 3 | 0 | 0 | 0 | 1 | 1 |
| 1033: | 1 | 1 | 0 | 6 | 0 | 0 | 3 | 3 |
| 1041: | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 2 |
| 1049: | 3 | 1 | 3 | 0 | 0 | 2 | 2 | 1 |
| 1057: | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 |
| 1065: | 2 | 0 | 1 | 0 | 1 | 3 | 4 | 1 |
| 1073: | 0 | 0 | 1 | 1 | 0 | 1 | 2 | 2 |
| 1081: | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1089: | 1 | 1 | 0 | 0 | 0 | 0 | 5 | 0 |
| 1097: | 1 | 1 | 1 | 3 | 2 | 1 | 0 | 1 |
| 1105: | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 1113: | 1 | 0 | 1 | 1 | 2 | 0 | 5 | 2 |
| 1121: | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 0 |
| 1129: | 1 | 0 | 3 | 2 | 0 | 1 | 0 | 3 |
| 1137: | 1 | 0 | 0 | 4 | 1 | 5 | 0 | 1 |
| 1145: | 2 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 1153: | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 0 |
| 1161: | 1 | 0 | 2 | 1 | 1 | 0 | 1 | 2 |
| 1169: | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 1177: | 1 | 1 | 2 | 0 | 3 | 2 | 1 | 2 |
| 1185: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 1193: | 0 | 0 | 2 | 1 | 0 | 3 | 0 | 0 |
| 1201: | 0 | 2 | 0 | 1 | 1 | 0 | 1 | 1 |
| 1209: | 2 | 0 | 1 | 0 | 1 | 1 | 2 | 0 |
| 1217: | 0 | 1 | 0 | 0 | 2 | 4 | 1 | 0 |
| 1225: | 0 | 0 | 3 | 1 | 0 | 1 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 0 | 3 | 2 | 1 | 0 | 0 | 0 | 1 |

Sample Title: BLANK

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 3 | 0 | 2 | 1 | 2 | 3 | 0 | 0 |
| 1249: | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1257: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1265: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 1273: | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 1 |
| 1281: | 0 | 2 | 0 | 0 | 2 | 1 | 2 | 0 |
| 1289: | 1 | 1 | 3 | 0 | 3 | 0 | 1 | 1 |
| 1297: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1305: | 0 | 2 | 0 | 0 | 0 | 1 | 3 | 0 |
| 1313: | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 0 |
| 1321: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 1329: | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 |
| 1337: | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 2 |
| 1345: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 1353: | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 1 |
| 1361: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 1369: | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 1 |
| 1377: | 0 | 2 | 2 | 0 | 1 | 0 | 0 | 1 |
| 1385: | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 2 |
| 1393: | 0 | 0 | 2 | 0 | 0 | 1 | 2 | 0 |
| 1401: | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 1409: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 1417: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 2 |
| 1425: | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 2 |
| 1433: | 1 | 0 | 0 | 0 | 2 | 1 | 1 | 0 |
| 1441: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1449: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1457: | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 2 |
| 1465: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 1473: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1481: | 1 | 0 | 2 | 0 | 2 | 0 | 1 | 3 |
| 1489: | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 |
| 1497: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 1505: | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 0 |
| 1513: | 0 | 2 | 1 | 1 | 1 | 0 | 0 | 1 |
| 1521: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 |
| 1529: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1537: | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 0 |
| 1545: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1553: | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1561: | 0 | 2 | 2 | 0 | 1 | 0 | 2 | 1 |
| 1569: | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 1577: | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1585: | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 2 |
| 1593: | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 |
| 1601: | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |
| 1609: | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 |
| 1617: | 2 | 1 | 2 | 0 | 1 | 0 | 0 | 0 |
| 1625: | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 1633: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1641: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 1649: | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 |
| 1657: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |

Sample Title: BLANK

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| 1681: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1689: | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1697: | 0 | 3 | 2 | 1 | 0 | 0 | 0 | 0 |
| 1705: | 0 | 3 | 0 | 2 | 0 | 0 | 0 | 0 |
| 1713: | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 1721: | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 0 |
| 1729: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 1737: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 1745: | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 1 |
| 1753: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 1761: | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| 1769: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 1777: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1793: | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |
| 1801: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 1809: | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 1817: | 1 | 1 | 3 | 1 | 1 | 0 | 1 | 0 |
| 1825: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1833: | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 0 |
| 1841: | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| 1849: | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1857: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 1865: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 1873: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1881: | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 1889: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1897: | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 1905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1913: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1921: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1929: | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 |
| 1937: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 1945: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1953: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1961: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1969: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1977: | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 0 |
| 1985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1993: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2001: | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| 2009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2025: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2049: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2057: | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 |
| 2065: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2073: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2081: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |

Sample Title: BLANK

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2113: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2121: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2129: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2137: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2145: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2153: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2169: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2177: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2201: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2209: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2217: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2233: | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2249: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2257: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2265: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2281: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2289: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2305: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2345: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2353: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2369: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2377: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2385: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2393: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2401: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2417: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2425: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2449: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2457: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2465: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 2473: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2481: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2489: | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2497: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2505: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2513: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2521: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: BLANK

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2545: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2553: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2561: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2569: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2585: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2593: | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 |
| 2601: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2609: | 0 | 0 | 0 | 1 | 3 | 1 | 2 | 4 |
| 2617: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2633: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2641: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2649: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2665: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 2673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2689: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2713: | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2721: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 |
| 2737: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2745: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2761: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2785: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2793: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2801: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2809: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2865: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2889: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2897: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2913: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2921: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2945: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2953: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: BLANK

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2977: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2985: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3001: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3009: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3017: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3081: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3097: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3121: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3145: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3169: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3193: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3233: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3273: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3297: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: BLANK

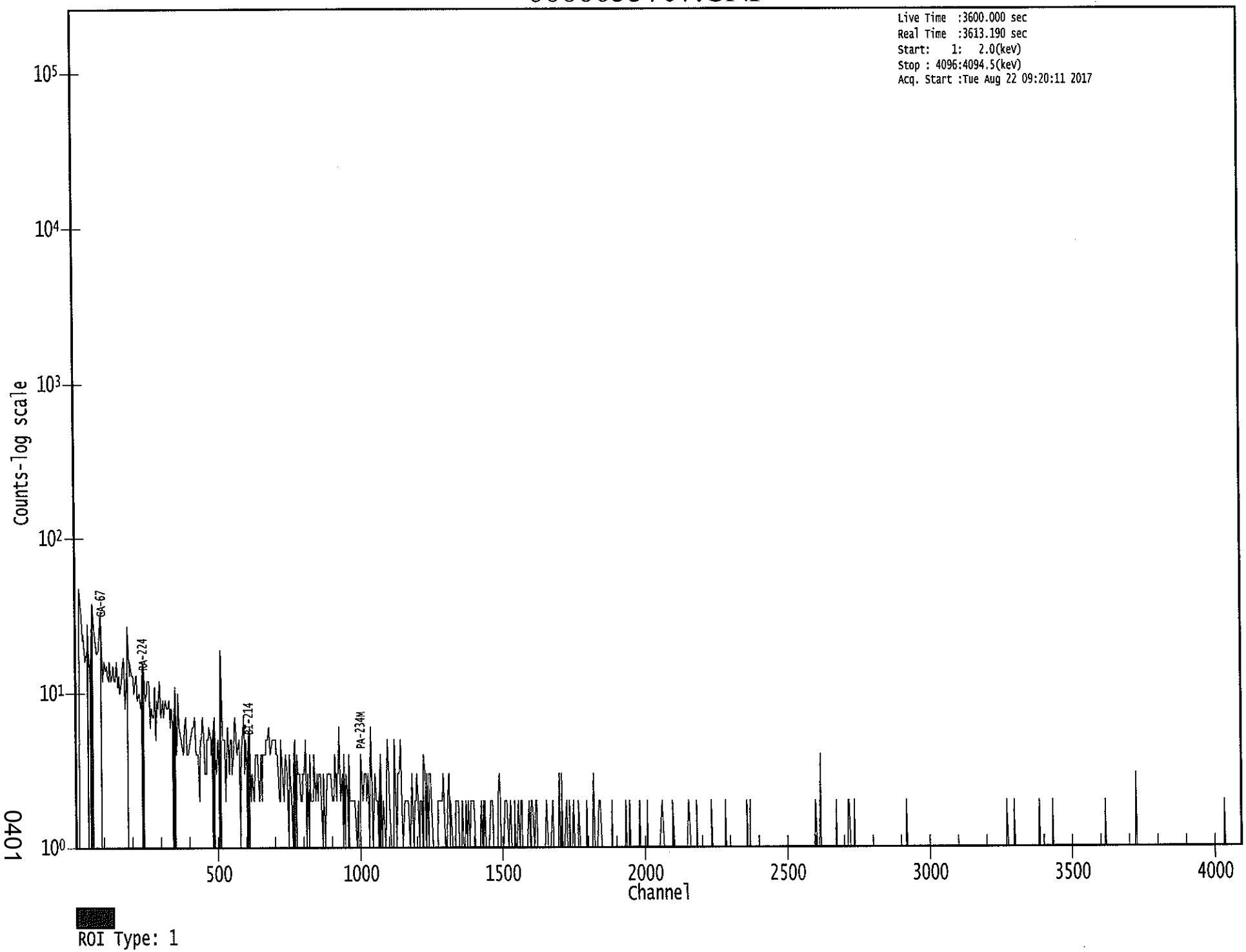
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3505: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3617: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3721: | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3793: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: BLANK

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3905: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3961: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3969: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4033: | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |

# 0000055707.CNF




0401

Apex-Gamma

8/22

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-03 |
| Sample Description | : HTC-A03-S003-1218-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.958E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:41:01AM |
| Acquisition Started | : 8/22/2017 9:01:05AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE1 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.2 seconds |
| Dead Time | : 0.03 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 19 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55704 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 10:01:09AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 75.89 | 76.48 | 0.0000 | 0.00 |
| 2 | 87.43 | 88.01 | 0.0000 | 0.00 |
| 3 | 92.27 | 92.85 | 0.0000 | 0.00 |
| 4 | 186.23 | 186.71 | 0.0000 | 0.00 |
| 5 | 238.60 | 239.03 | 0.0000 | 0.00 |
| 6 | 241.85 | 242.27 | 0.0000 | 0.00 |
| 7 | 270.43 | 270.83 | 0.0000 | 0.00 |
| 8 | 291.63 | 292.00 | 0.0000 | 0.00 |
| 9 | 295.29 | 295.66 | 0.0000 | 0.00 |
| 10 | 300.32 | 300.68 | 0.0000 | 0.00 |
| 11 | 338.18 | 338.51 | 0.0000 | 0.00 |
| 12 | 352.00 | 352.31 | 0.0000 | 0.00 |
| 13 | 410.22 | 410.47 | 0.0000 | 0.00 |
| 14 | 462.60 | 462.80 | 0.0000 | 0.00 |
| 15 | 496.28 | 496.44 | 0.0000 | 0.00 |
| 16 | 511.40 | 511.55 | 0.0000 | 0.00 |
| 17 | 559.66 | 559.76 | 0.0000 | 0.00 |
| 18 | 583.35 | 583.43 | 0.0000 | 0.00 |
| 19 | 587.93 | 588.00 | 0.0000 | 0.00 |
| 20 | 606.13 | 606.19 | 0.0000 | 0.00 |
| 21 | 609.76 | 609.81 | 0.0000 | 0.00 |
| 22 | 717.76 | 717.70 | 0.0000 | 0.00 |
| 23 | 726.86 | 726.79 | 0.0000 | 0.00 |
| 24 | 767.94 | 767.83 | 0.0000 | 0.00 |
| 25 | 795.25 | 795.11 | 0.0000 | 0.00 |
| 26 | 881.77 | 881.55 | 0.0000 | 0.00 |
| 27 | 911.85 | 911.60 | 0.0000 | 0.00 |
| 28 | 935.22 | 934.95 | 0.0000 | 0.00 |
| 29 | 965.51 | 965.20 | 0.0000 | 0.00 |
| 30 | 969.34 | 969.03 | 0.0000 | 0.00 |
| 31 | 1084.74 | 1084.32 | 0.0000 | 0.00 |
| 32 | 1120.29 | 1119.83 | 0.0000 | 0.00 |
| 33 | 1220.65 | 1220.09 | 0.0000 | 0.00 |
| 34 | 1320.68 | 1320.02 | 0.0000 | 0.00 |
| 35 | 1378.00 | 1377.29 | 0.0000 | 0.00 |
| 36 | 1384.16 | 1383.44 | 0.0000 | 0.00 |
| 37 | 1461.51 | 1460.72 | 0.0000 | 0.00 |
| 38 | 1509.82 | 1508.97 | 0.0000 | 0.00 |
| 39 | 1591.87 | 1590.94 | 0.0000 | 0.00 |
| 40 | 1629.21 | 1628.25 | 0.0000 | 0.00 |
| 41 | 1675.37 | 1674.36 | 0.0000 | 0.00 |
| 42 | 1679.48 | 1678.47 | 0.0000 | 0.00 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1705.18 | 1704.15 | 0.0000 | 0.00 |
| 44 | 1730.16 | 1729.10 | 0.0000 | 0.00 |
| 45 | 1747.41 | 1746.33 | 0.0000 | 0.00 |
| 46 | 1765.64 | 1764.54 | 0.0000 | 0.00 |
| 47 | 1797.41 | 1796.29 | 0.0000 | 0.00 |
| 48 | 1849.65 | 1848.48 | 0.0000 | 0.00 |
| 49 | 1890.08 | 1888.86 | 0.0000 | 0.00 |
| 50 | 1974.69 | 1973.40 | 0.0000 | 0.00 |
| 51 | 2104.74 | 2103.32 | 0.0000 | 0.00 |
| 52 | 2204.76 | 2203.24 | 0.0000 | 0.00 |
| 53 | 2207.76 | 2206.24 | 0.0000 | 0.00 |
| 54 | 2244.80 | 2243.25 | 0.0000 | 0.00 |
| 55 | 2308.18 | 2306.57 | 0.0000 | 0.00 |
| 56 | 2615.79 | 2613.88 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 10:01:09AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 75.89 | 71 - | 81 | 76.48 | 9.68E+02 | 150.28 | 2.49E+03 | 3.93 |
| M | 2 | 87.43 | 82 - | 100 | 88.01 | 1.72E+02 | 72.48 | 9.70E+02 | 1.67 |
| m | 3 | 92.27 | 82 - | 100 | 92.85 | 3.09E+02 | 76.22 | 8.91E+02 | 1.67 |
| | 4 | 186.23 | 182 - | 192 | 186.71 | 2.59E+02 | 98.23 | 1.13E+03 | 1.87 |
| M | 5 | 238.60 | 234 - | 246 | 239.03 | 7.19E+02 | 68.17 | 4.33E+02 | 1.72 |
| m | 6 | 241.85 | 234 - | 246 | 242.27 | 2.15E+02 | 90.91 | 6.77E+02 | 2.94 |
| | 7 | 270.43 | 268 - | 276 | 270.83 | 6.16E+01 | 63.91 | 5.93E+02 | 1.72 |
| M | 8 | 291.63 | 291 - | 299 | 292.00 | 2.12E+01 | 12.25 | 5.64E+01 | 1.69 |
| m | 9 | 295.29 | 291 - | 299 | 295.66 | 2.44E+02 | 49.25 | 3.42E+02 | 1.64 |
| | 10 | 300.32 | 299 - | 304 | 300.68 | 3.99E+01 | 43.67 | 3.38E+02 | 2.00 |
| | 11 | 338.18 | 334 - | 342 | 338.51 | 1.09E+02 | 57.42 | 4.39E+02 | 1.52 |
| | 12 | 352.00 | 347 - | 357 | 352.31 | 4.78E+02 | 73.04 | 4.56E+02 | 1.93 |
| | 13 | 410.22 | 408 - | 414 | 410.47 | 3.39E+01 | 35.70 | 2.08E+02 | 1.48 |
| | 14 | 462.60 | 459 - | 466 | 462.80 | 5.27E+01 | 40.35 | 2.37E+02 | 1.77 |
| | 15 | 496.28 | 493 - | 500 | 496.44 | 4.32E+01 | 34.06 | 1.66E+02 | 4.97 |
| | 16 | 511.40 | 506 - | 519 | 511.55 | 1.87E+02 | 64.61 | 3.66E+02 | 2.73 |
| | 17 | 559.66 | 555 - | 566 | 559.76 | 6.28E+01 | 41.81 | 1.90E+02 | 4.76 |
| M | 18 | 583.35 | 581 - | 594 | 583.43 | 2.32E+02 | 32.43 | 6.33E+01 | 2.07 |
| m | 19 | 587.93 | 581 - | 594 | 588.00 | 2.40E+01 | 25.26 | 8.27E+01 | 1.86 |
| M | 20 | 606.13 | 604 - | 620 | 606.19 | 3.45E+01 | 18.65 | 6.06E+01 | 2.06 |
| m | 21 | 609.76 | 604 - | 620 | 609.81 | 3.57E+02 | 44.55 | 9.89E+01 | 2.06 |
| | 22 | 717.76 | 713 - | 722 | 717.70 | 3.03E+01 | 31.05 | 1.21E+02 | 1.75 |
| | 23 | 726.86 | 723 - | 732 | 726.79 | 6.34E+01 | 39.46 | 1.89E+02 | 2.13 |
| | 24 | 767.94 | 762 - | 773 | 767.83 | 6.88E+01 | 40.84 | 1.75E+02 | 2.02 |
| | 25 | 795.25 | 792 - | 799 | 795.11 | 2.81E+01 | 28.98 | 1.16E+02 | 1.46 |
| | 26 | 881.77 | 879 - | 884 | 881.55 | 1.76E+01 | 17.66 | 4.89E+01 | 2.15 |
| | 27 | 911.85 | 906 - | 920 | 911.60 | 1.75E+02 | 46.14 | 1.53E+02 | 2.22 |
| | 28 | 935.22 | 930 - | 939 | 934.95 | 3.54E+01 | 28.98 | 9.92E+01 | 1.15 |
| M | 29 | 965.51 | 962 - | 974 | 965.20 | 3.78E+01 | 27.02 | 8.56E+01 | 2.22 |
| m | 30 | 969.34 | 962 - | 974 | 969.03 | 1.07E+02 | 30.70 | 8.86E+01 | 2.22 |
| | 31 | 1084.74 | 1080 - | 1087 | 1084.32 | 2.90E+01 | 21.73 | 5.79E+01 | 3.35 |
| | 32 | 1120.29 | 1113 - | 1127 | 1119.83 | 8.98E+01 | 43.97 | 1.68E+02 | 2.93 |
| | 33 | 1220.65 | 1217 - | 1223 | 1220.09 | 1.90E+01 | 24.39 | 9.41E+01 | 1.21 |
| | 34 | 1320.68 | 1315 - | 1325 | 1320.02 | 2.01E+01 | 23.08 | 5.98E+01 | 5.91 |
| | 35 | 1378.00 | 1372 - | 1380 | 1377.29 | 2.51E+01 | 15.66 | 2.18E+01 | 2.21 |
| | 36 | 1384.16 | 1381 - | 1386 | 1383.44 | 9.25E+00 | 10.00 | 1.35E+01 | 3.26 |
| | 37 | 1461.51 | 1455 - | 1466 | 1460.72 | 8.42E+02 | 65.08 | 1.10E+02 | 2.15 |
| | 38 | 1509.82 | 1504 - | 1512 | 1508.97 | 1.53E+01 | 17.15 | 3.54E+01 | 3.99 |
| | 39 | 1591.87 | 1586 - | 1595 | 1590.94 | 1.83E+01 | 15.65 | 2.34E+01 | 6.51 |
| | 40 | 1629.21 | 1623 - | 1631 | 1628.25 | 1.81E+01 | 11.51 | 9.74E+00 | 3.83 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| M | 41 | 1675.37 | 1671 - | 1683 | 1674.36 | 9.03E+00 | 7.00 | 1.21E+00 | 2.72 |
| m | 42 | 1679.48 | 1671 - | 1683 | 1678.47 | 6.14E+00 | 9.17 | 5.05E+00 | 2.72 |
| | 43 | 1705.18 | 1701 - | 1707 | 1704.15 | 1.05E+01 | 7.76 | 2.92E+00 | 1.81 |
| | 44 | 1730.16 | 1725 - | 1733 | 1729.10 | 1.36E+01 | 10.61 | 8.89E+00 | 3.98 |
| | 45 | 1747.41 | 1743 - | 1749 | 1746.33 | 7.10E+00 | 8.03 | 5.80E+00 | 2.34 |
| | 46 | 1765.64 | 1760 - | 1772 | 1764.54 | 7.48E+01 | 18.93 | 8.32E+00 | 3.20 |
| | 47 | 1797.41 | 1792 - | 1799 | 1796.29 | 8.00E+00 | 7.48 | 4.00E+00 | 1.56 |
| | 48 | 1849.65 | 1842 - | 1855 | 1848.48 | 1.99E+01 | 11.87 | 6.22E+00 | 9.95 |
| | 49 | 1890.08 | 1885 - | 1893 | 1888.86 | 8.57E+00 | 10.99 | 1.29E+01 | 1.52 |
| | 50 | 1974.69 | 1970 - | 1976 | 1973.40 | 6.25E+00 | 6.65 | 3.50E+00 | 1.27 |
| | 51 | 2104.74 | 2097 - | 2110 | 2103.32 | 2.80E+01 | 10.58 | 0.00E+00 | 3.69 |
| M | 52 | 2204.76 | 2199 - | 2209 | 2203.24 | 1.48E+01 | 12.65 | 1.77E+01 | 2.63 |
| m | 53 | 2207.76 | 2199 - | 2209 | 2206.24 | 1.08E+01 | 12.81 | 1.21E+01 | 2.63 |
| | 54 | 2244.80 | 2240 - | 2246 | 2243.25 | 8.45E+00 | 7.23 | 3.10E+00 | 2.78 |
| | 55 | 2308.18 | 2304 - | 2308 | 2306.57 | 5.79E+00 | 5.85 | 2.43E+00 | 1.06 |
| | 56 | 2615.79 | 2609 - | 2619 | 2613.88 | 7.96E+01 | 18.93 | 4.83E+00 | 2.17 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 10:01:09AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 75.89 | 71 - | 81 | 9.68E+02 | 150.28 | 2.49E+03 | 1.12E+02 |
| M | 2 | 87.43 | 82 - | 100 | 1.72E+02 | 72.48 | 9.70E+02 | 5.12E+01 |
| m | 3 | 92.27 | 82 - | 100 | 3.09E+02 | 76.22 | 8.91E+02 | 4.91E+01 |
| | 4 | 186.23 | 182 - | 192 | 2.59E+02 | 98.23 | 1.13E+03 | 7.63E+01 |
| M | 5 | 238.60 | 234 - | 246 | 7.19E+02 | 68.17 | 4.33E+02 | 3.42E+01 |
| m | 6 | 241.85 | 234 - | 246 | 2.15E+02 | 90.91 | 6.77E+02 | 4.28E+01 |
| | 7 | 270.43 | 268 - | 276 | 6.16E+01 | 63.91 | 5.93E+02 | 5.09E+01 |
| M | 8 | 291.63 | 291 - | 299 | 2.12E+01 | 12.25 | 5.64E+01 | 1.23E+01 |
| m | 9 | 295.29 | 291 - | 299 | 2.44E+02 | 49.25 | 3.42E+02 | 3.04E+01 |
| | 10 | 300.32 | 299 - | 304 | 3.99E+01 | 43.67 | 3.38E+02 | 3.44E+01 |
| | 11 | 338.18 | 334 - | 342 | 1.09E+02 | 57.42 | 4.39E+02 | 4.40E+01 |
| | 12 | 352.00 | 347 - | 357 | 4.78E+02 | 73.04 | 4.56E+02 | 4.81E+01 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 13 | 410.22 | 408 - | 414 | 3.39E+01 | 35.70 | 2.08E+02 | 2.77E+01 |
| | 14 | 462.60 | 459 - | 466 | 5.27E+01 | 40.35 | 2.37E+02 | 3.09E+01 |
| | 15 | 496.28 | 493 - | 500 | 4.32E+01 | 34.06 | 1.66E+02 | 2.58E+01 |
| | 16 | 511.40 | 506 - | 519 | 1.87E+02 | 64.61 | 3.66E+02 | 4.81E+01 |
| | 17 | 559.66 | 555 - | 566 | 6.28E+01 | 41.81 | 1.90E+02 | 3.18E+01 |
| M | 18 | 583.35 | 581 - | 594 | 2.32E+02 | 32.43 | 6.33E+01 | 1.31E+01 |
| m | 19 | 587.93 | 581 - | 594 | 2.40E+01 | 25.26 | 8.27E+01 | 1.50E+01 |
| M | 20 | 606.13 | 604 - | 620 | 3.45E+01 | 18.65 | 6.06E+01 | 1.28E+01 |
| m | 21 | 609.76 | 604 - | 620 | 3.57E+02 | 44.55 | 9.89E+01 | 1.64E+01 |
| | 22 | 717.76 | 713 - | 722 | 3.03E+01 | 31.05 | 1.21E+02 | 2.39E+01 |
| | 23 | 726.86 | 723 - | 732 | 6.34E+01 | 39.46 | 1.89E+02 | 2.97E+01 |
| | 24 | 767.94 | 762 - | 773 | 6.88E+01 | 40.84 | 1.75E+02 | 3.07E+01 |
| | 25 | 795.25 | 792 - | 799 | 2.81E+01 | 28.98 | 1.16E+02 | 2.22E+01 |
| | 26 | 881.77 | 879 - | 884 | 1.76E+01 | 17.66 | 4.89E+01 | 1.28E+01 |
| | 27 | 911.85 | 906 - | 920 | 1.75E+02 | 46.14 | 1.53E+02 | 1.37E+01 |
| | 28 | 935.22 | 930 - | 939 | 3.54E+01 | 28.98 | 9.92E+01 | 2.17E+01 |
| M | 29 | 965.51 | 962 - | 974 | 3.78E+01 | 27.02 | 8.56E+01 | 1.52E+01 |
| m | 30 | 969.34 | 962 - | 974 | 1.07E+02 | 30.70 | 8.86E+01 | 1.55E+01 |
| | 31 | 1084.74 | 1080 - | 1087 | 2.90E+01 | 21.73 | 5.79E+01 | 1.55E+01 |
| | 32 | 1120.29 | 1113 - | 1127 | 8.98E+01 | 43.97 | 1.68E+02 | 3.26E+01 |
| | 33 | 1220.65 | 1217 - | 1223 | 1.90E+01 | 24.39 | 9.41E+01 | 1.87E+01 |
| | 34 | 1320.68 | 1315 - | 1325 | 2.01E+01 | 23.08 | 5.98E+01 | 1.75E+01 |
| | 35 | 1378.00 | 1372 - | 1380 | 2.51E+01 | 15.66 | 2.18E+01 | 9.89E+00 |
| | 36 | 1384.16 | 1381 - | 1386 | 9.25E+00 | 10.00 | 1.35E+01 | 6.52E+00 |
| | 37 | 1461.51 | 1455 - | 1466 | 8.42E+02 | 65.08 | 1.10E+02 | 2.42E+01 |
| | 38 | 1509.82 | 1504 - | 1512 | 1.53E+01 | 17.15 | 3.54E+01 | 1.25E+01 |
| | 39 | 1591.87 | 1586 - | 1595 | 1.83E+01 | 15.65 | 2.34E+01 | 1.08E+01 |
| | 40 | 1629.21 | 1623 - | 1631 | 1.81E+01 | 11.51 | 9.74E+00 | 6.37E+00 |
| M | 41 | 1675.37 | 1671 - | 1683 | 9.03E+00 | 7.00 | 1.21E+00 | 1.81E+00 |
| m | 42 | 1679.48 | 1671 - | 1683 | 6.14E+00 | 9.17 | 5.05E+00 | 3.70E+00 |
| | 43 | 1705.18 | 1701 - | 1707 | 1.05E+01 | 7.76 | 2.92E+00 | 3.50E+00 |
| | 44 | 1730.16 | 1725 - | 1733 | 1.36E+01 | 10.61 | 8.89E+00 | 6.28E+00 |
| | 45 | 1747.41 | 1743 - | 1749 | 7.10E+00 | 8.03 | 5.80E+00 | 4.94E+00 |
| | 46 | 1765.64 | 1760 - | 1772 | 7.48E+01 | 18.93 | 8.32E+00 | 6.31E+00 |
| | 47 | 1797.41 | 1792 - | 1799 | 8.00E+00 | 7.48 | 4.00E+00 | 4.03E+00 |
| | 48 | 1849.65 | 1842 - | 1855 | 1.99E+01 | 11.87 | 6.22E+00 | 6.44E+00 |
| | 49 | 1890.08 | 1885 - | 1893 | 8.57E+00 | 10.99 | 1.29E+01 | 7.64E+00 |
| | 50 | 1974.69 | 1970 - | 1976 | 6.25E+00 | 6.65 | 3.50E+00 | 3.61E+00 |
| | 51 | 2104.74 | 2097 - | 2110 | 2.80E+01 | 10.58 | 0.00E+00 | 0.00E+00 |
| M | 52 | 2204.76 | 2199 - | 2209 | 1.48E+01 | 12.65 | 1.77E+01 | 6.92E+00 |
| m | 53 | 2207.76 | 2199 - | 2209 | 1.08E+01 | 12.81 | 1.21E+01 | 5.73E+00 |
| | 54 | 2244.80 | 2240 - | 2246 | 8.45E+00 | 7.23 | 3.10E+00 | 3.53E+00 |
| | 55 | 2308.18 | 2304 - | 2308 | 5.79E+00 | 5.85 | 2.43E+00 | 2.74E+00 |
| | 56 | 2615.79 | 2609 - | 2619 | 7.96E+01 | 18.93 | 4.83E+00 | 5.19E+00 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 10:01:09AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 75.89 | 71 - | 81 | 76.48 | 9.68E+02 | 150.28 | 2.49E+03 | ..... |
| M | 2 | 87.43 | 82 - | 100 | 88.01 | 1.72E+02 | 72.48 | 9.70E+02 | SN-126 |
| | | | | | | | | | CD-109 |
| | | | | | | | | | LU-176 |
| | | | | | | | | | NP-237 |
| | | | | | | | | | EU-155 |
| m | 3 | 92.27 | 82 - | 100 | 92.85 | 3.09E+02 | 76.22 | 8.91E+02 | ..... |
| | 4 | 186.23 | 182 - | 192 | 186.71 | 2.59E+02 | 98.23 | 1.13E+03 | RA-226 |
| M | 5 | 238.60 | 234 - | 246 | 239.03 | 7.19E+02 | 68.17 | 4.33E+02 | PB-212 |
| m | 6 | 241.85 | 234 - | 246 | 242.27 | 2.15E+02 | 90.91 | 6.77E+02 | RA-224 |
| | 7 | 270.43 | 268 - | 276 | 270.83 | 6.16E+01 | 63.91 | 5.93E+02 | ..... |
| M | 8 | 291.63 | 291 - | 299 | 292.00 | 2.12E+01 | 12.25 | 5.64E+01 | ..... |
| m | 9 | 295.29 | 291 - | 299 | 295.66 | 2.44E+02 | 49.25 | 3.42E+02 | PB-214 |
| | 10 | 300.32 | 299 - | 304 | 300.68 | 3.99E+01 | 43.67 | 3.38E+02 | GA-67 |
| | | | | | | | | | PB-212 |
| | | | | | | | | | BI-210M |
| | 11 | 338.18 | 334 - | 342 | 338.51 | 1.09E+02 | 57.42 | 4.39E+02 | AC-228 |
| | 12 | 352.00 | 347 - | 357 | 352.31 | 4.78E+02 | 73.04 | 4.56E+02 | PB-214 |
| | 13 | 410.22 | 408 - | 414 | 410.47 | 3.39E+01 | 35.70 | 2.08E+02 | HO-166M |
| | 14 | 462.60 | 459 - | 466 | 462.80 | 5.27E+01 | 40.35 | 2.37E+02 | SB-125 |
| | 15 | 496.28 | 493 - | 500 | 496.44 | 4.32E+01 | 34.06 | 1.66E+02 | RU-103 |
| | 16 | 511.40 | 506 - | 519 | 511.55 | 1.87E+02 | 64.61 | 3.66E+02 | ..... |
| | 17 | 559.66 | 555 - | 566 | 559.76 | 6.28E+01 | 41.81 | 1.90E+02 | ..... |
| M | 18 | 583.35 | 581 - | 594 | 583.43 | 2.32E+02 | 32.43 | 6.33E+01 | TL-208 |
| m | 19 | 587.93 | 581 - | 594 | 588.00 | 2.40E+01 | 25.26 | 8.27E+01 | ..... |
| M | 20 | 606.13 | 604 - | 620 | 606.19 | 3.45E+01 | 18.65 | 6.06E+01 | ..... |
| m | 21 | 609.76 | 604 - | 620 | 609.81 | 3.57E+02 | 44.55 | 9.89E+01 | BI-214 |
| | 22 | 717.76 | 713 - | 722 | 717.70 | 3.03E+01 | 31.05 | 1.21E+02 | ..... |
| | 23 | 726.86 | 723 - | 732 | 726.79 | 6.34E+01 | 39.46 | 1.89E+02 | BI-212 |
| | 24 | 767.94 | 762 - | 773 | 767.83 | 6.88E+01 | 40.84 | 1.75E+02 | ..... |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 25 | 795.25 | 792 - | 799 | 795.11 | 2.81E+01 | 28.98 | 1.16E+02 | CS-134 |
| | 26 | 881.77 | 879 - | 884 | 881.55 | 1.76E+01 | 17.66 | 4.89E+01 | ..... |
| | 27 | 911.85 | 906 - | 920 | 911.60 | 1.75E+02 | 46.14 | 1.53E+02 | TL-204<br>AC-228 |
| | 28 | 935.22 | 930 - | 939 | 934.95 | 3.54E+01 | 28.98 | 9.92E+01 | ..... |
| M | 29 | 965.51 | 962 - | 974 | 965.20 | 3.78E+01 | 27.02 | 8.56E+01 | ..... |
| m | 30 | 969.34 | 962 - | 974 | 969.03 | 1.07E+02 | 30.70 | 8.86E+01 | AC-228 |
| | 31 | 1084.74 | 1080 - | 1087 | 1084.32 | 2.90E+01 | 21.73 | 5.79E+01 | ..... |
| | 32 | 1120.29 | 1113 - | 1127 | 1119.83 | 8.98E+01 | 43.97 | 1.68E+02 | BI-214<br>SC-46 |
| | 33 | 1220.65 | 1217 - | 1223 | 1220.09 | 1.90E+01 | 24.39 | 9.41E+01 | TA-182 |
| | 34 | 1320.68 | 1315 - | 1325 | 1320.02 | 2.01E+01 | 23.08 | 5.98E+01 | ..... |
| | 35 | 1378.00 | 1372 - | 1380 | 1377.29 | 2.51E+01 | 15.66 | 2.18E+01 | ..... |
| | 36 | 1384.16 | 1381 - | 1386 | 1383.44 | 9.25E+00 | 10.00 | 1.35E+01 | AG-110M |
| | 37 | 1461.51 | 1455 - | 1466 | 1460.72 | 8.42E+02 | 65.08 | 1.10E+02 | K-40 |
| | 38 | 1509.82 | 1504 - | 1512 | 1508.97 | 1.53E+01 | 17.15 | 3.54E+01 | ..... |
| | 39 | 1591.87 | 1586 - | 1595 | 1590.94 | 1.83E+01 | 15.65 | 2.34E+01 | ..... |
| | 40 | 1629.21 | 1623 - | 1631 | 1628.25 | 1.81E+01 | 11.51 | 9.74E+00 | ..... |
| M | 41 | 1675.37 | 1671 - | 1683 | 1674.36 | 9.03E+00 | 7.00 | 1.21E+00 | ..... |
| m | 42 | 1679.48 | 1671 - | 1683 | 1678.47 | 6.14E+00 | 9.17 | 5.05E+00 | ..... |
| | 43 | 1705.18 | 1701 - | 1707 | 1704.15 | 1.05E+01 | 7.76 | 2.92E+00 | ..... |
| | 44 | 1730.16 | 1725 - | 1733 | 1729.10 | 1.36E+01 | 10.61 | 8.89E+00 | ..... |
| | 45 | 1747.41 | 1743 - | 1749 | 1746.33 | 7.10E+00 | 8.03 | 5.80E+00 | ..... |
| | 46 | 1765.64 | 1760 - | 1772 | 1764.54 | 7.48E+01 | 18.93 | 8.32E+00 | ..... |
| | 47 | 1797.41 | 1792 - | 1799 | 1796.29 | 8.00E+00 | 7.48 | 4.00E+00 | ..... |
| | 48 | 1849.65 | 1842 - | 1855 | 1848.48 | 1.99E+01 | 11.87 | 6.22E+00 | ..... |
| | 49 | 1890.08 | 1885 - | 1893 | 1888.86 | 8.57E+00 | 10.99 | 1.29E+01 | ..... |
| | 50 | 1974.69 | 1970 - | 1976 | 1973.40 | 6.25E+00 | 6.65 | 3.50E+00 | ..... |
| | 51 | 2104.74 | 2097 - | 2110 | 2103.32 | 2.80E+01 | 10.58 | 0.00E+00 | ..... |
| M | 52 | 2204.76 | 2199 - | 2209 | 2203.24 | 1.48E+01 | 12.65 | 1.77E+01 | BI-214 |
| m | 53 | 2207.76 | 2199 - | 2209 | 2206.24 | 1.08E+01 | 12.81 | 1.21E+01 | ..... |
| | 54 | 2244.80 | 2240 - | 2246 | 2243.25 | 8.45E+00 | 7.23 | 3.10E+00 | ..... |
| | 55 | 2308.18 | 2304 - | 2308 | 2306.57 | 5.79E+00 | 5.85 | 2.43E+00 | ..... |
| | 56 | 2615.79 | 2609 - | 2619 | 2613.88 | 7.96E+01 | 18.93 | 4.83E+00 | ..... |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 10:01:09AM

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 75.89 | 9.68E+02 | 150.28 | 2.75E-02 | 2.39E-03 |
| M | 2 | 87.43 | 1.72E+02 | 72.48 | 2.74E-02 | 2.51E-03 |
| m | 3 | 92.27 | 3.09E+02 | 76.22 | 2.73E-02 | 2.45E-03 |
| | 4 | 186.23 | 2.59E+02 | 98.23 | 2.17E-02 | 1.68E-03 |
| M | 5 | 238.60 | 7.19E+02 | 68.17 | 1.89E-02 | 1.53E-03 |
| m | 6 | 241.85 | 2.15E+02 | 90.91 | 1.87E-02 | 1.52E-03 |
| | 7 | 270.43 | 6.16E+01 | 63.91 | 1.74E-02 | 1.43E-03 |
| M | 8 | 291.63 | 2.12E+01 | 12.25 | 1.66E-02 | 1.38E-03 |
| m | 9 | 295.29 | 2.44E+02 | 49.25 | 1.64E-02 | 1.37E-03 |
| | 10 | 300.32 | 3.99E+01 | 43.67 | 1.62E-02 | 1.36E-03 |
| | 11 | 338.18 | 1.09E+02 | 57.42 | 1.50E-02 | 1.27E-03 |
| | 12 | 352.00 | 4.78E+02 | 73.04 | 1.45E-02 | 1.24E-03 |
| | 13 | 410.22 | 3.39E+01 | 35.70 | 1.30E-02 | 1.13E-03 |
| | 14 | 462.60 | 5.27E+01 | 40.35 | 1.19E-02 | 1.10E-03 |
| | 15 | 496.28 | 4.32E+01 | 34.06 | 1.13E-02 | 1.08E-03 |
| | 16 | 511.40 | 1.87E+02 | 64.61 | 1.10E-02 | 1.07E-03 |
| | 17 | 559.66 | 6.28E+01 | 41.81 | 1.03E-02 | 1.04E-03 |
| M | 18 | 583.35 | 2.32E+02 | 32.43 | 9.96E-03 | 1.02E-03 |
| m | 19 | 587.93 | 2.40E+01 | 25.26 | 9.90E-03 | 1.02E-03 |
| M | 20 | 606.13 | 3.45E+01 | 18.65 | 9.67E-03 | 1.01E-03 |
| m | 21 | 609.76 | 3.57E+02 | 44.55 | 9.63E-03 | 1.01E-03 |
| | 22 | 717.76 | 3.03E+01 | 31.05 | 8.50E-03 | 8.83E-04 |
| | 23 | 726.86 | 6.34E+01 | 39.46 | 8.41E-03 | 8.68E-04 |
| | 24 | 767.94 | 6.88E+01 | 40.84 | 8.07E-03 | 8.03E-04 |
| | 25 | 795.25 | 2.81E+01 | 28.98 | 7.86E-03 | 7.60E-04 |
| | 26 | 881.77 | 1.76E+01 | 17.66 | 7.26E-03 | 6.22E-04 |
| | 27 | 911.85 | 1.75E+02 | 46.14 | 7.08E-03 | 5.91E-04 |
| | 28 | 935.22 | 3.54E+01 | 28.98 | 6.95E-03 | 5.82E-04 |
| M | 29 | 965.51 | 3.78E+01 | 27.02 | 6.78E-03 | 5.71E-04 |
| m | 30 | 969.34 | 1.07E+02 | 30.70 | 6.76E-03 | 5.69E-04 |
| | 31 | 1084.74 | 2.90E+01 | 21.73 | 6.22E-03 | 5.25E-04 |
| | 32 | 1120.29 | 8.98E+01 | 43.97 | 6.07E-03 | 5.11E-04 |
| | 33 | 1220.65 | 1.90E+01 | 24.39 | 5.70E-03 | 4.80E-04 |
| | 34 | 1320.68 | 2.01E+01 | 23.08 | 5.38E-03 | 4.57E-04 |
| | 35 | 1378.00 | 2.51E+01 | 15.66 | 5.22E-03 | 4.44E-04 |
| | 36 | 1384.16 | 9.25E+00 | 10.00 | 5.20E-03 | 4.42E-04 |
| | 37 | 1461.51 | 8.42E+02 | 65.08 | 5.00E-03 | 4.25E-04 |
| | 38 | 1509.82 | 1.53E+01 | 17.15 | 4.89E-03 | 4.13E-04 |
| | 39 | 1591.87 | 1.83E+01 | 15.65 | 4.71E-03 | 3.94E-04 |
| | 40 | 1629.21 | 1.81E+01 | 11.51 | 4.63E-03 | 3.86E-04 |
| M | 41 | 1675.37 | 9.03E+00 | 7.00 | 4.54E-03 | 3.75E-04 |
| m | 42 | 1679.48 | 6.14E+00 | 9.17 | 4.53E-03 | 3.74E-04 |
| | 43 | 1705.18 | 1.05E+01 | 7.76 | 4.48E-03 | 3.68E-04 |
| | 44 | 1730.16 | 1.36E+01 | 10.61 | 4.44E-03 | 3.62E-04 |
| | 45 | 1747.41 | 7.10E+00 | 8.03 | 4.41E-03 | 3.58E-04 |
| | 46 | 1765.64 | 7.48E+01 | 18.93 | 4.37E-03 | 3.54E-04 |
| | 47 | 1797.41 | 8.00E+00 | 7.48 | 4.32E-03 | 3.47E-04 |
| | 48 | 1849.65 | 1.99E+01 | 11.87 | 4.23E-03 | 3.38E-04 |
| | 49 | 1890.08 | 8.57E+00 | 10.99 | 4.17E-03 | 3.38E-04 |
| | 50 | 1974.69 | 6.25E+00 | 6.65 | 4.04E-03 | 3.38E-04 |
| | 51 | 2104.74 | 2.80E+01 | 10.58 | 3.86E-03 | 3.38E-04 |
| M | 52 | 2204.76 | 1.48E+01 | 12.65 | 3.74E-03 | 3.38E-04 |
| m | 53 | 2207.76 | 1.08E+01 | 12.81 | 3.73E-03 | 3.38E-04 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 54 | 2244.80 | 8.45E+00 | 7.23 | 3.69E-03 | 3.38E-04 |
| 55 | 2308.18 | 5.79E+00 | 5.85 | 3.62E-03 | 3.38E-04 |
| 56 | 2615.79 | 7.96E+01 | 18.93 | 3.30E-03 | 3.38E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 10:01:09AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 75.89 | 9.68E+02 | 150.28 | | | 9.68E+02 | 1.50E+02 |
| M | 2 | 87.43 | 1.72E+02 | 72.48 | | | 1.72E+02 | 7.25E+01 |
| m | 3 | 92.27 | 3.09E+02 | 76.22 | 1.38E+02 | 1.72E+01 | 1.72E+02 | 7.81E+01 |
| | 4 | 186.23 | 2.59E+02 | 98.23 | 5.22E+01 | 7.59E+00 | 2.06E+02 | 9.85E+01 |
| M | 5 | 238.60 | 7.19E+02 | 68.17 | 2.13E+01 | 6.33E+00 | 6.97E+02 | 6.85E+01 |
| m | 6 | 241.85 | 2.15E+02 | 90.91 | | | 2.15E+02 | 9.09E+01 |
| | 7 | 270.43 | 6.16E+01 | 63.91 | 1.23E+00 | 4.98E+00 | 6.04E+01 | 6.41E+01 |
| M | 8 | 291.63 | 2.12E+01 | 12.25 | | | 2.12E+01 | 1.22E+01 |
| m | 9 | 295.29 | 2.44E+02 | 49.25 | | | 2.44E+02 | 4.93E+01 |
| | 10 | 300.32 | 3.99E+01 | 43.67 | | | 3.99E+01 | 4.37E+01 |
| | 11 | 338.18 | 1.09E+02 | 57.42 | | | 1.09E+02 | 5.74E+01 |
| | 12 | 352.00 | 4.78E+02 | 73.04 | 5.79E+00 | 4.49E+00 | 4.72E+02 | 7.32E+01 |
| | 13 | 410.22 | 3.39E+01 | 35.70 | | | 3.39E+01 | 3.57E+01 |
| | 14 | 462.60 | 5.27E+01 | 40.35 | | | 5.27E+01 | 4.03E+01 |
| | 15 | 496.28 | 4.32E+01 | 34.06 | | | 4.32E+01 | 3.41E+01 |
| | 16 | 511.40 | 1.87E+02 | 64.61 | 7.28E+01 | 5.30E+00 | 1.14E+02 | 6.48E+01 |
| | 17 | 559.66 | 6.28E+01 | 41.81 | | | 6.28E+01 | 4.18E+01 |
| M | 18 | 583.35 | 2.32E+02 | 32.43 | 2.72E+00 | 3.05E+00 | 2.30E+02 | 3.26E+01 |
| m | 19 | 587.93 | 2.40E+01 | 25.26 | | | 2.40E+01 | 2.53E+01 |
| M | 20 | 606.13 | 3.45E+01 | 18.65 | | | 3.45E+01 | 1.87E+01 |
| m | 21 | 609.76 | 3.57E+02 | 44.55 | 6.35E+00 | 4.02E+00 | 3.51E+02 | 4.47E+01 |
| | 22 | 717.76 | 3.03E+01 | 31.05 | | | 3.03E+01 | 3.10E+01 |
| | 23 | 726.86 | 6.34E+01 | 39.46 | | | 6.34E+01 | 3.95E+01 |
| | 24 | 767.94 | 6.88E+01 | 40.84 | | | 6.88E+01 | 4.08E+01 |
| | 25 | 795.25 | 2.81E+01 | 28.98 | | | 2.81E+01 | 2.90E+01 |
| | 26 | 881.77 | 1.76E+01 | 17.66 | | | 1.76E+01 | 1.77E+01 |
| | 27 | 911.85 | 1.75E+02 | 46.14 | 5.31E+00 | 3.00E+00 | 1.69E+02 | 4.62E+01 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 28 | 935.22 | 3.54E+01 | 28.98 | | | 3.54E+01 | 2.90E+01 |
| M | 29 | 965.51 | 3.78E+01 | 27.02 | | | 3.78E+01 | 2.70E+01 |
| m | 30 | 969.34 | 1.07E+02 | 30.70 | | | 1.07E+02 | 3.07E+01 |
| | 31 | 1084.74 | 2.90E+01 | 21.73 | | | 2.90E+01 | 2.17E+01 |
| | 32 | 1120.29 | 8.98E+01 | 43.97 | | | 8.98E+01 | 4.40E+01 |
| | 33 | 1220.65 | 1.90E+01 | 24.39 | | | 1.90E+01 | 2.44E+01 |
| | 34 | 1320.68 | 2.01E+01 | 23.08 | | | 2.01E+01 | 2.31E+01 |
| | 35 | 1378.00 | 2.51E+01 | 15.66 | | | 2.51E+01 | 1.57E+01 |
| | 36 | 1384.16 | 9.25E+00 | 10.00 | | | 9.25E+00 | 1.00E+01 |
| | 37 | 1461.51 | 8.42E+02 | 65.08 | 8.09E+00 | 2.23E+00 | 8.34E+02 | 6.51E+01 |
| | 38 | 1509.82 | 1.53E+01 | 17.15 | | | 1.53E+01 | 1.71E+01 |
| | 39 | 1591.87 | 1.83E+01 | 15.65 | | | 1.83E+01 | 1.57E+01 |
| | 40 | 1629.21 | 1.81E+01 | 11.51 | | | 1.81E+01 | 1.15E+01 |
| M | 41 | 1675.37 | 9.03E+00 | 7.00 | | | 9.03E+00 | 7.00E+00 |
| m | 42 | 1679.48 | 6.14E+00 | 9.17 | | | 6.14E+00 | 9.17E+00 |
| | 43 | 1705.18 | 1.05E+01 | 7.76 | | | 1.05E+01 | 7.76E+00 |
| | 44 | 1730.16 | 1.36E+01 | 10.61 | | | 1.36E+01 | 1.06E+01 |
| | 45 | 1747.41 | 7.10E+00 | 8.03 | | | 7.10E+00 | 8.03E+00 |
| | 46 | 1765.64 | 7.48E+01 | 18.93 | | | 7.48E+01 | 1.89E+01 |
| | 47 | 1797.41 | 8.00E+00 | 7.48 | | | 8.00E+00 | 7.48E+00 |
| | 48 | 1849.65 | 1.99E+01 | 11.87 | | | 1.99E+01 | 1.19E+01 |
| | 49 | 1890.08 | 8.57E+00 | 10.99 | | | 8.57E+00 | 1.10E+01 |
| | 50 | 1974.69 | 6.25E+00 | 6.65 | | | 6.25E+00 | 6.65E+00 |
| | 51 | 2104.74 | 2.80E+01 | 10.58 | | | 2.80E+01 | 1.06E+01 |
| M | 52 | 2204.76 | 1.48E+01 | 12.65 | | | 1.48E+01 | 1.26E+01 |
| m | 53 | 2207.76 | 1.08E+01 | 12.81 | | | 1.08E+01 | 1.28E+01 |
| | 54 | 2244.80 | 8.45E+00 | 7.23 | | | 8.45E+00 | 7.23E+00 |
| | 55 | 2308.18 | 5.79E+00 | 5.85 | | | 5.79E+00 | 5.85E+00 |
| | 56 | 2615.79 | 7.96E+01 | 18.93 | 5.63E+00 | 1.38E+00 | 7.40E+01 | 1.90E+01 |

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 10:01:09AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

Corrected Area is: Original * Peak Ratio - Background

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 75.89 | 9.68E+02 | 150.28 | | | 9.68E+02 | 1.50E+02 |
| M | 2 | 87.43 | 1.72E+02 | 72.48 | | | 1.72E+02 | 7.25E+01 |
| m | 3 | 92.27 | 3.09E+02 | 76.22 | 1.38E+02 | 1.72E+01 | 1.72E+02 | 7.81E+01 |
| | 4 | 186.23 | 2.59E+02 | 98.23 | 5.22E+01 | 7.59E+00 | 2.06E+02 | 9.85E+01 |
| M | 5 | 238.60 | 7.19E+02 | 68.17 | 2.13E+01 | 6.33E+00 | 6.97E+02 | 6.85E+01 |
| m | 6 | 241.85 | 2.15E+02 | 90.91 | | | 2.15E+02 | 9.09E+01 |
| | 7 | 270.43 | 6.16E+01 | 63.91 | 1.23E+00 | 4.98E+00 | 6.04E+01 | 6.41E+01 |
| M | 8 | 291.63 | 2.12E+01 | 12.25 | | | 2.12E+01 | 1.22E+01 |
| m | 9 | 295.29 | 2.44E+02 | 49.25 | | | 2.44E+02 | 4.93E+01 |
| | 10 | 300.32 | 3.99E+01 | 43.67 | | | 3.99E+01 | 4.37E+01 |
| | 11 | 338.18 | 1.09E+02 | 57.42 | | | 1.09E+02 | 5.74E+01 |
| | 12 | 352.00 | 4.78E+02 | 73.04 | 5.79E+00 | 4.49E+00 | 4.72E+02 | 7.32E+01 |
| | 13 | 410.22 | 3.39E+01 | 35.70 | | | 3.39E+01 | 3.57E+01 |
| | 14 | 462.60 | 5.27E+01 | 40.35 | | | 5.27E+01 | 4.03E+01 |
| | 15 | 496.28 | 4.32E+01 | 34.06 | | | 4.32E+01 | 3.41E+01 |
| | 16 | 511.40 | 1.87E+02 | 64.61 | 7.28E+01 | 5.30E+00 | 1.14E+02 | 6.48E+01 |
| | 17 | 559.66 | 6.28E+01 | 41.81 | | | 6.28E+01 | 4.18E+01 |
| M | 18 | 583.35 | 2.32E+02 | 32.43 | 2.72E+00 | 3.05E+00 | 2.30E+02 | 3.26E+01 |
| m | 19 | 587.93 | 2.40E+01 | 25.26 | | | 2.40E+01 | 2.53E+01 |
| M | 20 | 606.13 | 3.45E+01 | 18.65 | | | 3.45E+01 | 1.87E+01 |
| m | 21 | 609.76 | 3.57E+02 | 44.55 | 6.35E+00 | 4.02E+00 | 3.51E+02 | 4.47E+01 |
| | 22 | 717.76 | 3.03E+01 | 31.05 | | | 3.03E+01 | 3.10E+01 |
| | 23 | 726.86 | 6.34E+01 | 39.46 | | | 6.34E+01 | 3.95E+01 |
| | 24 | 767.94 | 6.88E+01 | 40.84 | | | 6.88E+01 | 4.08E+01 |
| | 25 | 795.25 | 2.81E+01 | 28.98 | | | 2.81E+01 | 2.90E+01 |
| | 26 | 881.77 | 1.76E+01 | 17.66 | | | 1.76E+01 | 1.77E+01 |
| | 27 | 911.85 | 1.75E+02 | 46.14 | 5.31E+00 | 3.00E+00 | 1.69E+02 | 4.62E+01 |
| | 28 | 935.22 | 3.54E+01 | 28.98 | | | 3.54E+01 | 2.90E+01 |
| M | 29 | 965.51 | 3.78E+01 | 27.02 | | | 3.78E+01 | 2.70E+01 |
| m | 30 | 969.34 | 1.07E+02 | 30.70 | | | 1.07E+02 | 3.07E+01 |
| | 31 | 1084.74 | 2.90E+01 | 21.73 | | | 2.90E+01 | 2.17E+01 |
| | 32 | 1120.29 | 8.98E+01 | 43.97 | | | 8.98E+01 | 4.40E+01 |
| | 33 | 1220.65 | 1.90E+01 | 24.39 | | | 1.90E+01 | 2.44E+01 |
| | 34 | 1320.68 | 2.01E+01 | 23.08 | | | 2.01E+01 | 2.31E+01 |
| | 35 | 1378.00 | 2.51E+01 | 15.66 | | | 2.51E+01 | 1.57E+01 |
| | 36 | 1384.16 | 9.25E+00 | 10.00 | | | 9.25E+00 | 1.00E+01 |
| | 37 | 1461.51 | 8.42E+02 | 65.08 | 8.09E+00 | 2.23E+00 | 8.34E+02 | 6.51E+01 |
| | 38 | 1509.82 | 1.53E+01 | 17.15 | | | 1.53E+01 | 1.71E+01 |
| | 39 | 1591.87 | 1.83E+01 | 15.65 | | | 1.83E+01 | 1.57E+01 |
| | 40 | 1629.21 | 1.81E+01 | 11.51 | | | 1.81E+01 | 1.15E+01 |
| M | 41 | 1675.37 | 9.03E+00 | 7.00 | | | 9.03E+00 | 7.00E+00 |
| m | 42 | 1679.48 | 6.14E+00 | 9.17 | | | 6.14E+00 | 9.17E+00 |
| | 43 | 1705.18 | 1.05E+01 | 7.76 | | | 1.05E+01 | 7.76E+00 |
| | 44 | 1730.16 | 1.36E+01 | 10.61 | | | 1.36E+01 | 1.06E+01 |
| | 45 | 1747.41 | 7.10E+00 | 8.03 | | | 7.10E+00 | 8.03E+00 |
| | 46 | 1765.64 | 7.48E+01 | 18.93 | | | 7.48E+01 | 1.89E+01 |
| | 47 | 1797.41 | 8.00E+00 | 7.48 | | | 8.00E+00 | 7.48E+00 |
| | 48 | 1849.65 | 1.99E+01 | 11.87 | | | 1.99E+01 | 1.19E+01 |
| | 49 | 1890.08 | 8.57E+00 | 10.99 | | | 8.57E+00 | 1.10E+01 |
| | 50 | 1974.69 | 6.25E+00 | 6.65 | | | 6.25E+00 | 6.65E+00 |
| | 51 | 2104.74 | 2.80E+01 | 10.58 | | | 2.80E+01 | 1.06E+01 |
| M | 52 | 2204.76 | 1.48E+01 | 12.65 | | | 1.48E+01 | 1.26E+01 |
| m | 53 | 2207.76 | 1.08E+01 | 12.81 | | | 1.08E+01 | 1.28E+01 |
| | 54 | 2244.80 | 8.45E+00 | 7.23 | | | 8.45E+00 | 7.23E+00 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 55 | 2308.18 | 5.79E+00 | 5.85 | | | 5.79E+00 | 5.85E+00 |
| 56 | 2615.79 | 7.96E+01 | 18.93 | 5.63E+00 | 1.38E+00 | 7.40E+01 | 1.90E+01 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.924 | 1460.81 | * | 10.67 | 1.69E+01 | 1.97E+00 |
| RU-103 | 0.874 | 497.08 | * | 89.00 | 2.67E-01 | 2.14E-01 |
| CD-109 | 0.943 | 88.03 | * | 3.72 | 2.11E+00 | 9.19E-01 |
| SN-126 | 0.997 | 87.57 | * | 37.00 | 1.83E-01 | 7.89E-02 |
| BI-212 | 0.751 | 727.17 | * | 11.80 | 6.88E-01 | 4.35E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.999 | 238.63 | * | 44.60 | 8.95E-01 | 1.14E-01 |
| | | 300.09 | * | 3.41 | 7.77E-01 | 8.53E-01 |
| BI-214 | 0.743 | 609.31 | * | 46.30 | 8.50E-01 | 1.40E-01 |
| | | 1120.29 | * | 15.10 | 1.06E+00 | 5.25E-01 |
| | | 1764.49 | | 15.80 | | |
| | | 2204.22 | * | 4.98 | 8.61E-01 | 7.38E-01 |
| PB-214 | 0.999 | 295.21 | * | 19.19 | 8.35E-01 | 1.82E-01 |
| | | 351.92 | * | 37.19 | 9.42E-01 | 1.67E-01 |
| RA-224 | 0.887 | 240.98 | * | 3.95 | 3.13E+00 | 1.35E+00 |
| RA-226 | 1.000 | 186.21 | * | 3.28 | 3.13E+00 | 5.92E+00 |
| AC-228 | 0.950 | 338.32 | * | 11.40 | 6.87E-01 | 3.68E-01 |
| | | 911.07 | * | 27.70 | 9.31E-01 | 2.66E-01 |
| | | 969.11 | * | 16.60 | 1.03E+00 | 3.07E-01 |
| NP-237 | 0.872 | 86.50 | * | 12.60 | 5.38E-01 | 2.32E-01 |

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 10:01:09AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 75.89 | 2.68852E-01 | 7.76 | | |
| m | 3 | 92.27 | 4.76557E-02 | 22.77 | | |
| | 7 | 270.43 | 1.67670E-02 | 53.10 | | |
| M | 8 | 291.63 | 5.87807E-03 | 28.94 | | |
| | 13 | 410.22 | 9.41425E-03 | 52.67 | Tol. | HO-166M |
| | 14 | 462.60 | 1.46272E-02 | 38.31 | Tol. | SB-125 |
| | 16 | 511.40 | 3.16909E-02 | 28.41 | | |
| | 17 | 559.66 | 1.74499E-02 | 33.28 | | |
| M | 18 | 583.35 | 6.37819E-02 | 7.09 | Sum | |
| m | 19 | 587.93 | 6.65467E-03 | 52.72 | | |
| M | 20 | 606.13 | 9.57236E-03 | 27.07 | | |
| | 22 | 717.76 | 8.40965E-03 | 51.28 | | |
| | 24 | 767.94 | 1.90972E-02 | 29.70 | | |
| | 25 | 795.25 | 7.81492E-03 | 51.51 | Sum | |
| | 26 | 881.77 | 4.88095E-03 | 50.26 | | |
| | 28 | 935.22 | 9.83333E-03 | 40.94 | | |
| M | 29 | 965.51 | 1.05138E-02 | 35.70 | Sum | |
| | 31 | 1084.74 | 8.06513E-03 | 37.41 | | |
| | 33 | 1220.65 | 5.26936E-03 | 64.28 | Tol. | TA-182 |
| | 34 | 1320.68 | 5.58333E-03 | 57.42 | Sum | |
| | 35 | 1378.00 | 6.97145E-03 | 31.20 | | |
| | 36 | 1384.16 | 2.56944E-03 | 54.05 | Tol. | AG-110M |
| | 38 | 1509.82 | 4.25505E-03 | 55.97 | | |
| | 39 | 1591.87 | 5.08333E-03 | 42.77 | | |
| | 40 | 1629.21 | 5.03623E-03 | 31.74 | | |
| M | 41 | 1675.37 | 2.50734E-03 | 38.77 | | |
| m | 42 | 1679.48 | 1.70633E-03 | 74.60 | | |
| | 43 | 1705.18 | 2.92824E-03 | 36.82 | | |
| | 44 | 1730.16 | 3.76543E-03 | 39.12 | Sum | |
| | 45 | 1747.41 | 1.97222E-03 | 56.56 | | |
| | 46 | 1765.64 | 2.07894E-02 | 12.65 | | |
| | 47 | 1797.41 | 2.22222E-03 | 46.77 | | |
| | 48 | 1849.65 | 5.52536E-03 | 29.85 | | |
| | 49 | 1890.08 | 2.37963E-03 | 64.14 | | |
| | 50 | 1974.69 | 1.73611E-03 | 53.22 | | |
| | 51 | 2104.74 | 7.77778E-03 | 18.90 | | |
| m | 53 | 2207.76 | 3.00214E-03 | 59.25 | | |
| | 54 | 2244.80 | 2.34722E-03 | 42.77 | | |
| | 55 | 2308.18 | 1.60714E-03 | 50.58 | | |
| | 56 | 2615.79 | 2.05445E-02 | 12.83 | | |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.92 | 1460.81 | * | 10.67 | 1.69E+01 | 1.97E+00 |
| RU-103 | 0.87 | 497.08 | * | 89.00 | 2.67E-01 | 2.14E-01 |
| CD-109 | 0.94 | 88.03 | * | 3.72 | 2.11E+00 | 9.19E-01 |
| SN-126 | 0.99 | 87.57 | * | 37.00 | 1.83E-01 | 7.89E-02 |
| BI-212 | 0.75 | 727.17 | * | 11.80 | 6.88E-01 | 4.35E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.99 | 238.63 | * | 44.60 | 8.95E-01 | 1.14E-01 |
| | | 300.09 | * | 3.41 | 7.77E-01 | 8.53E-01 |
| BI-214 | 0.74 | 609.31 | * | 46.30 | 8.50E-01 | 1.40E-01 |
| | | 1120.29 | * | 15.10 | 1.06E+00 | 5.25E-01 |
| | | 1764.49 | | 15.80 | | |
| | | 2204.22 | * | 4.98 | 8.61E-01 | 7.38E-01 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 8.35E-01 | 1.82E-01 |
| | | 351.92 | * | 37.19 | 9.42E-01 | 1.67E-01 |
| RA-224 | 0.88 | 240.98 | * | 3.95 | 3.13E+00 | 1.35E+00 |
| RA-226 | 1.00 | 186.21 | * | 3.28 | 3.13E+00 | 5.92E+00 |
| AC-228 | 0.95 | 338.32 | * | 11.40 | 6.87E-01 | 3.68E-01 |
| | | 911.07 | * | 27.70 | 9.31E-01 | 2.66E-01 |
| | | 969.11 | * | 16.60 | 1.03E+00 | 3.07E-01 |
| NP-237 | 0.87 | 86.50 | * | 12.60 | 5.38E-01 | 2.32E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.924 | 1.69E+01 | 1.97E+00 | |
| | RU-103 | 0.874 | 2.67E-01 | 2.14E-01 | |
| ? | CD-109 | 0.943 | 2.11E+00 | 9.19E-01 | |
| ? | SN-126 | 0.997 | 1.83E-01 | 7.89E-02 | |
| | BI-212 | 0.751 | 6.88E-01 | 4.35E-01 | |
| | PB-212 | 0.999 | 8.93E-01 | 1.13E-01 | |
| | BI-214 | 0.743 | 8.63E-01 | 1.33E-01 | |
| | PB-214 | 0.999 | 8.94E-01 | 1.23E-01 | |
| | RA-224 | 0.887 | 3.13E+00 | 1.35E+00 | |
| | RA-226 | 1.000 | 3.13E+00 | 5.92E+00 | |
| | AC-228 | 0.950 | 9.08E-01 | 1.76E-01 | |
| ? | NP-237 | 0.872 | 5.38E-01 | 2.32E-01 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-03

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# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 10:01:09AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 75.89 | 2.68852E-01 | 7.76 | | |
| m | 3 | 92.27 | 4.76557E-02 | 22.77 | | |
| | 7 | 270.43 | 1.67670E-02 | 53.10 | | |
| M | 8 | 291.63 | 5.87807E-03 | 28.94 | | |
| | 13 | 410.22 | 9.41425E-03 | 52.67 | Tol. | HO-166M |
| | 14 | 462.60 | 1.46272E-02 | 38.31 | Tol. | SB-125 |
| | 16 | 511.40 | 3.16909E-02 | 28.41 | | |
| | 17 | 559.66 | 1.74499E-02 | 33.28 | | |
| M | 18 | 583.35 | 6.37819E-02 | 7.09 | Sum | |
| m | 19 | 587.93 | 6.65467E-03 | 52.72 | | |
| M | 20 | 606.13 | 9.57236E-03 | 27.07 | | |
| | 22 | 717.76 | 8.40965E-03 | 51.28 | | |
| | 24 | 767.94 | 1.90972E-02 | 29.70 | | |
| | 25 | 795.25 | 7.81492E-03 | 51.51 | Sum | |
| | 26 | 881.77 | 4.88095E-03 | 50.26 | | |
| | 28 | 935.22 | 9.83333E-03 | 40.94 | | |
| M | 29 | 965.51 | 1.05138E-02 | 35.70 | Sum | |
| | 31 | 1084.74 | 8.06513E-03 | 37.41 | | |
| | 33 | 1220.65 | 5.26936E-03 | 64.28 | Tol. | TA-182 |
| | 34 | 1320.68 | 5.58333E-03 | 57.42 | Sum | |
| | 35 | 1378.00 | 6.97145E-03 | 31.20 | | |
| | 36 | 1384.16 | 2.56944E-03 | 54.05 | Tol. | AG-110M |
| | 38 | 1509.82 | 4.25505E-03 | 55.97 | | |
| | 39 | 1591.87 | 5.08333E-03 | 42.77 | | |
| | 40 | 1629.21 | 5.03623E-03 | 31.74 | | |
| M | 41 | 1675.37 | 2.50734E-03 | 38.77 | | |
| m | 42 | 1679.48 | 1.70633E-03 | 74.60 | | |
| | 43 | 1705.18 | 2.92824E-03 | 36.82 | | |
| | 44 | 1730.16 | 3.76543E-03 | 39.12 | Sum | |
| | 45 | 1747.41 | 1.97222E-03 | 56.56 | | |
| | 46 | 1765.64 | 2.07894E-02 | 12.65 | | |
| | 47 | 1797.41 | 2.22222E-03 | 46.77 | | |
| | 48 | 1849.65 | 5.52536E-03 | 29.85 | | |
| | 49 | 1890.08 | 2.37963E-03 | 64.14 | | |
| | 50 | 1974.69 | 1.73611E-03 | 53.22 | | |

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| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 51 | 2104.74 | 7.77778E-03 | 18.90 | | |
| m | 53 | 2207.76 | 3.00214E-03 | 59.25 | | |
| | 54 | 2244.80 | 2.34722E-03 | 42.77 | | |
| | 55 | 2308.18 | 1.60714E-03 | 50.58 | | |
| | 56 | 2615.79 | 2.05445E-02 | 12.83 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | | 10.42 | -6.01E-02 | 1.48E+00 | 1.48E+00 |
| + | NA-22 | 1274.54 | | 99.94 | -3.92E-03 | 6.59E-02 | 6.59E-02 |
| + | @ NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | AL-26 | 1808.65 | | 99.76 | -7.55E-03 | 3.30E-02 | 3.30E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.69E+01 | 1.05E+00 | 1.05E+00 |
| + | @ AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | TI-44 | 67.88 | | 94.40 | 1.54E-02 | 5.00E-02 | 5.00E-02 |
| | | 78.34 | | 96.00 | 1.13E-01 | | 6.38E-02 |
| + | SC-46 | 889.25 | | 99.98 | 3.41E-02 | 1.31E-01 | 1.31E-01 |
| | | 1120.51 | | 99.99 | 2.79E-01 | | 2.22E-01 |
| + | V-48 | 983.52 | | 99.98 | -1.03E-01 | 3.96E+00 | 3.96E+00 |
| | | 1312.10 | | 97.50 | 1.04E+00 | | 4.07E+00 |
| + | CR-51 | 320.08 | | 9.83 | -1.64E+00 | 5.36E+00 | 5.36E+00 |
| + | MN-54 | 834.83 | | 99.97 | 2.50E-02 | 7.49E-02 | 7.49E-02 |
| + | CO-56 | 846.75 | | 99.96 | 3.96E-02 | 1.40E-01 | 1.40E-01 |
| | | 1037.75 | | 14.03 | -6.85E-01 | | 1.01E+00 |
| | | 1238.25 | | 67.00 | 2.13E-01 | | 3.01E-01 |
| | | 1771.40 | | 15.51 | -9.38E-01 | | 6.92E-01 |
| | | 2598.48 | | 16.90 | -3.22E-01 | | 4.27E-01 |
| + | CO-57 | 122.06 | | 85.51 | -8.48E-03 | 5.72E-02 | 5.72E-02 |
| | | 136.48 | | 10.60 | -7.69E-02 | | 4.71E-01 |
| + | CO-58 | 810.76 | | 99.40 | 1.95E-02 | 1.42E-01 | 1.42E-01 |
| + | FE-59 | 1099.22 | | 56.50 | -1.78E-01 | 4.86E-01 | 4.86E-01 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | FE-59 | 1291.56 | | 43.20 | -6.39E-02 | 4.86E-01 | 6.76E-01 |
| + | CO-60 | 1173.22 | | 100.00 | 1.12E-02 | 5.33E-02 | 7.03E-02 |
| | | 1332.49 | | 100.00 | 3.14E-03 | | 5.33E-02 |
| + | ZN-65 | 1115.52 | | 50.75 | -2.78E-01 | 1.63E-01 | 1.63E-01 |
| + | GA-67 | 93.31 | | 35.70 | 3.66E+08 | 2.07E+08 | 2.07E+08 |
| | | 208.95 | | 2.24 | 1.62E+09 | | 2.74E+09 |
| | | 300.22 | | 16.00 | -9.26E+08 | | 4.45E+08 |
| + | SE-75 | 121.11 | | 16.70 | 1.86E-02 | 1.16E-01 | 4.02E-01 |
| | | 136.00 | | 59.20 | -1.89E-02 | | 1.16E-01 |
| | | 264.65 | | 59.80 | 5.47E-02 | | 1.38E-01 |
| | | 279.53 | | 25.20 | 1.11E-01 | | 3.25E-01 |
| | | 400.65 | | 11.40 | 1.98E-01 | | 7.67E-01 |
| + | RB-82 | 776.52 | | 13.00 | 1.27E+00 | 6.24E+00 | 6.24E+00 |
| + | RB-83 | 520.41 | | 46.00 | -1.92E-02 | 2.12E-01 | 2.12E-01 |
| | | 529.64 | | 30.30 | 4.51E-02 | | 3.49E-01 |
| | | 552.65 | | 16.40 | 5.39E-02 | | 5.53E-01 |
| + | KR-85 | 513.99 | | 0.43 | 1.89E+01 | 1.65E+01 | 1.65E+01 |
| + | SR-85 | 513.99 | | 99.27 | 2.34E-01 | 2.05E-01 | 2.05E-01 |
| + | Y-88 | 898.02 | | 93.40 | -6.61E-03 | 8.11E-02 | 1.12E-01 |
| | | 1836.01 | | 99.38 | -4.59E-03 | | 8.11E-02 |
| + | MO-93 | 263.06 | | 56.72 | 2.23E-02 | 4.49E-02 | 8.27E-02 |
| | | 684.67 | | 99.68 | -2.77E-02 | | 5.41E-02 |
| | | 1477.11 | | 99.08 | 2.06E-02 | | 4.49E-02 |
| + | NB-93M | 16.57 | | 9.43 | 1.08E-01 | 4.57E-01 | 4.57E-01 |
| + | NB-94 | 702.63 | | 100.00 | 7.42E-03 | 4.99E-02 | 6.18E-02 |
| | | 871.10 | | 100.00 | -8.00E-03 | | 4.99E-02 |
| + | NB-95 | 765.79 | | 99.81 | 4.38E-01 | 4.83E-01 | 4.83E-01 |
| + | NB-95M | 235.69 | | 25.00 | -2.32E+08 | 3.76E+07 | 3.76E+07 |
| + | ZR-95 | 724.18 | | 43.70 | -8.49E-02 | 3.05E-01 | 4.20E-01 |
| | | 756.72 | | 55.30 | 1.71E-01 | | 3.05E-01 |
| + | MO-99 | 181.06 | | 6.20 | 9.44E+09 | 2.96E+10 | 4.69E+10 |
| | | 739.58 | | 12.80 | -1.28E+10 | | 2.96E+10 |
| | | 778.00 | | 4.50 | 1.54E+10 | | 8.32E+10 |
| + | RU-103 | 497.08 | * | 89.00 | 2.67E-01 | 3.36E-01 | 3.36E-01 |
| + | RU-106 | 621.84 | | 9.80 | 2.12E-01 | 6.13E-01 | 6.13E-01 |
| + | AG-108M | 433.93 | | 89.90 | 2.23E-02 | 5.41E-02 | 5.41E-02 |
| | | 614.37 | | 90.40 | -4.47E-01 | | 6.86E-02 |
| | | 722.95 | | 90.50 | -1.20E-01 | | 6.19E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 2.11E+00 | 3.84E+00 | 3.84E+00 |
| + | AG-110M | 657.75 | | 93.14 | -9.02E-02 | 7.61E-02 | 7.61E-02 |
| | | 677.61 | | 10.53 | -3.89E-01 | | 6.41E-01 |
| | | 706.67 | | 16.46 | 2.88E-01 | | 4.94E-01 |
| | | 763.93 | | 21.98 | -4.65E-01 | | 3.30E-01 |
| | | 884.67 | | 71.63 | -3.05E-02 | | 9.66E-02 |
| | | 1384.27 | | 23.94 | 1.32E-01 | | 2.68E-01 |
| + | CD-113M | 263.70 | | 0.02 | 2.45E+01 | 2.01E+02 | 2.01E+02 |
| + | SN-113 | 255.12 | | 1.93 | -3.14E-02 | 1.31E-01 | 3.56E+00 |
| | | 391.69 | | 64.90 | 1.94E-02 | | 1.31E-01 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | TE123M | 159.00 | | 84.10 | -5.30E-02 | 8.03E-02 | 8.03E-02 |
| + | SB-124 | 602.71 | | 97.87 | 7.90E-05 | 1.64E-01 | 1.64E-01 |
| | | 645.85 | | 7.26 | -2.06E-01 | | 2.13E+00 |
| | | 722.78 | | 11.10 | -3.05E+00 | | 1.58E+00 |
| | | 1691.02 | | 49.00 | 6.12E-02 | | 2.77E-01 |
| + | I-125 | 35.49 | | 6.49 | -1.07E+00 | 2.01E+00 | 2.01E+00 |
| + | SB-125 | 176.33 | | 6.89 | -1.02E-01 | 1.70E-01 | 6.14E-01 |
| | | 427.89 | | 29.33 | 3.44E-02 | | 1.70E-01 |
| | | 463.38 | | 10.35 | 4.77E-01 | | 5.86E-01 |
| | | 600.56 | | 17.80 | 7.21E-02 | | 2.93E-01 |
| | | 635.90 | | 11.32 | -2.19E-01 | | 4.43E-01 |
| + | SB-126 | 414.70 | | 83.30 | 1.28E+00 | 1.30E+01 | 1.40E+01 |
| | | 666.33 | | 99.60 | 6.23E+00 | | 1.60E+01 |
| | | 695.00 | | 99.60 | -5.45E+00 | | 1.30E+01 |
| | | 720.50 | | 53.80 | -3.93E+00 | | 2.57E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 1.83E-01 | 3.33E-01 | 3.33E-01 |
| + | SB-127 | 473.00 | | 25.00 | -3.70E+06 | 8.42E+06 | 9.80E+06 |
| | | 685.20 | | 35.70 | -4.30E+06 | | 8.42E+06 |
| | | 783.80 | | 14.70 | 3.25E+06 | | 2.11E+07 |
| + | I-129 | 29.78 | | 57.00 | -1.50E-02 | 8.00E-02 | 8.00E-02 |
| | | 33.60 | | 13.20 | 2.01E-01 | | 3.28E-01 |
| | | 39.58 | | 7.52 | -2.76E-02 | | 5.52E-01 |
| + | I-131 | 284.30 | | 6.05 | -5.62E+01 | 3.18E+02 | 3.81E+03 |
| | | 364.48 | | 81.20 | 1.62E+02 | | 3.18E+02 |
| | | 636.97 | | 7.26 | -1.24E+03 | | 3.36E+03 |
| | | 722.89 | | 1.80 | -3.10E+04 | | 1.60E+04 |
| + | TE-132 | 49.72 | | 13.10 | -5.00E+08 | 6.69E+07 | 4.46E+08 |
| | | 228.16 | | 88.00 | -8.71E+06 | | 6.69E+07 |
| + | BA-133 | 81.00 | | 33.00 | -4.31E-01 | 1.11E-01 | 1.35E-01 |
| | | 302.84 | | 17.80 | -3.78E-03 | | 2.78E-01 |
| | | 356.01 | | 60.00 | -8.45E-03 | | 1.11E-01 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -1.81E+05 | 5.70E+04 | 5.70E+04 |
| + | CS-134 | 563.23 | | 8.38 | -2.11E-01 | 6.30E-02 | 6.59E-01 |
| | | 569.32 | | 15.43 | 1.03E-01 | | 3.65E-01 |
| | | 604.70 | | 97.60 | -2.83E-03 | | 6.30E-02 |
| | | 795.84 | | 85.40 | 6.09E-02 | | 7.77E-02 |
| | | 801.93 | | 8.73 | -3.06E-02 | | 6.00E-01 |
| + | CS-135 | 268.24 | | 16.00 | -1.08E-02 | 3.10E-01 | 3.10E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | 5.45E-01 | 9.55E+00 | 1.02E+02 |
| | | 163.89 | | 4.61 | 2.69E+01 | | 1.58E+02 |
| | | 176.55 | | 13.56 | -9.03E+00 | | 5.41E+01 |
| | | 273.65 | | 12.66 | 2.14E+01 | | 7.31E+01 |
| | | 340.57 | | 48.50 | 2.70E+00 | | 2.21E+01 |
| | | 818.50 | | 99.70 | -1.39E+00 | | 9.55E+00 |
| | | 1048.07 | | 79.60 | 6.71E+00 | | 1.56E+01 |

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| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | CS-136 | 1235.34 | 19.70 | 3.49E+00 | 9.55E+00 | 7.87E+01 |
| + | CS-137 | 661.65 | 85.12 | 1.76E-02 | 7.39E-02 | 7.39E-02 |
| + | LA-138 | 788.74 | 34.00 | 6.15E-02 | 7.24E-02 | 1.75E-01 |
| | | 1435.80 | 66.00 | 6.27E-03 | | 7.24E-02 |
| + | CE-139 | 165.85 | 80.35 | -2.52E-02 | 8.01E-02 | 8.01E-02 |
| + | BA-140 | 162.64 | 6.70 | 3.47E+01 | 4.07E+01 | 1.27E+02 |
| | | 304.84 | 4.50 | 5.07E+01 | | 2.16E+02 |
| | | 423.70 | 3.20 | 4.67E+01 | | 3.15E+02 |
| | | 437.55 | 2.00 | -5.44E+01 | | 5.04E+02 |
| | | 537.32 | 25.00 | 3.10E+00 | | 4.07E+01 |
| + | LA-140 | 328.77 | 20.50 | 9.73E+00 | 9.41E+00 | 5.07E+01 |
| | | 487.03 | 45.50 | 1.21E+01 | | 2.40E+01 |
| | | 815.85 | 23.50 | -2.04E+01 | | 4.58E+01 |
| | | 1596.49 | 95.49 | -7.78E-01 | | 9.41E+00 |
| + | CE-141 | 145.44 | 48.40 | 3.78E-02 | 6.88E-01 | 6.88E-01 |
| + | @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | CE-144 | 133.54 | 10.80 | 3.25E-02 | 4.68E-01 | 4.68E-01 |
| + | PM-144 | 476.78 | 42.00 | -2.14E-02 | 6.29E-02 | 1.21E-01 |
| | | 618.01 | 98.60 | -1.24E-02 | | 6.29E-02 |
| | | 696.49 | 99.49 | 2.70E-03 | | 6.32E-02 |
| + | PM-145 | 36.85 | 21.70 | -1.90E-02 | 1.05E-01 | 1.93E-01 |
| | | 37.36 | 39.70 | -1.51E-02 | | 1.05E-01 |
| | | 42.30 | 15.10 | -5.41E-02 | | 2.72E-01 |
| | | 72.40 | 2.31 | -1.34E+00 | | 2.41E+00 |
| + | PM-146 | 453.90 | 39.94 | 5.11E-02 | 1.23E-01 | 1.23E-01 |
| | | 735.90 | 14.01 | -2.51E-01 | | 3.84E-01 |
| | | 747.13 | 13.10 | 2.62E-02 | | 4.19E-01 |
| + | ND-147 | 91.11 | 28.90 | 2.11E+02 | 1.00E+02 | 1.00E+02 |
| | | 531.02 | 13.10 | -3.48E+01 | | 1.89E+02 |
| + | PM-149 | 285.90 | 3.10 | -6.04E+12 | 4.47E+13 | 4.47E+13 |
| + | EU-152 | 121.78 | 20.50 | 8.65E-03 | 1.87E-01 | 1.87E-01 |
| | | 244.69 | 5.40 | -1.83E-01 | | 8.51E-01 |
| | | 344.27 | 19.13 | 6.13E-03 | | 2.37E-01 |
| | | 778.89 | 9.20 | 1.48E-01 | | 5.82E-01 |
| | | 964.01 | 10.40 | -1.57E+00 | | 6.86E-01 |
| | | 1085.78 | 7.22 | -1.24E-01 | | 8.76E-01 |
| | | 1112.02 | 9.60 | 3.82E-02 | | 5.79E-01 |
| | | 1407.95 | 14.94 | -8.58E-02 | | 3.27E-01 |
| + | GD-153 | 97.43 | 31.30 | -1.23E-01 | 1.67E-01 | 1.67E-01 |
| | | 103.18 | 22.20 | 3.45E-02 | | 2.23E-01 |
| + | EU-154 | 123.07 | 40.50 | -1.05E-02 | 9.51E-02 | 9.51E-02 |
| | | 723.30 | 19.70 | -5.61E-01 | | 2.90E-01 |
| | | 873.19 | 11.50 | 9.77E-02 | | 4.53E-01 |
| | | 996.32 | 10.30 | -1.34E-01 | | 5.80E-01 |
| | | 1004.76 | 17.90 | 1.52E-01 | | 3.57E-01 |
| | | 1274.45 | 35.50 | -1.05E-02 | | 1.76E-01 |
| + | EU-155 | 86.50 | 30.90 | 7.65E-02 | 1.69E-01 | 1.69E-01 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | EU-155 | 105.30 | | 20.70 | -3.63E-02 | 1.69E-01 | 1.84E-01 |
| + | EU-156 | 811.77 | | 10.40 | -4.58E+00 | 4.61E+01 | 4.61E+01 |
| | | 1153.47 | | 7.20 | 2.09E+01 | | 8.87E+01 |
| | | 1230.71 | | 8.90 | -1.76E+00 | | 7.88E+01 |
| + | HO-166M | 184.41 | | 72.60 | 1.28E-01 | 7.19E-02 | 7.19E-02 |
| | | 280.45 | | 29.60 | 2.64E-03 | | 1.52E-01 |
| | | 410.94 | | 11.10 | 2.84E-02 | | 4.29E-01 |
| | | 711.69 | | 54.10 | -2.13E-02 | | 8.46E-02 |
| + | TM-171 | 66.72 | | 0.14 | -4.42E+01 | 3.71E+01 | 3.71E+01 |
| + | HF-172 | 67.35 | | 5.31 | 3.02E-01 | 3.78E-01 | 9.80E-01 |
| | | 125.81 | | 11.30 | -3.18E-01 | | 3.78E-01 |
| + | LU-172 | 181.53 | | 20.60 | 1.14E+03 | 3.23E+03 | 5.68E+03 |
| | | 900.72 | | 29.81 | -1.09E+03 | | 5.14E+03 |
| | | 1093.66 | | 62.50 | 2.94E+03 | | 3.23E+03 |
| + | LU-173 | 100.72 | | 5.24 | -1.75E-02 | 2.78E-01 | 8.37E-01 |
| | | 272.11 | | 21.20 | 1.83E-01 | | 2.78E-01 |
| + | HF-175 | 343.40 | | 84.00 | 3.67E-03 | 1.38E-01 | 1.38E-01 |
| + | LU-176 | 88.34 | | 13.30 | -2.68E-01 | 4.69E-02 | 3.89E-01 |
| | | 201.83 | | 86.00 | 0.00E+00 | | 4.82E-02 |
| | | 306.78 | | 94.00 | 1.76E-02 | | 4.69E-02 |
| + | HF-181 | 133.02 | | 41.70 | 3.34E-02 | 2.72E-01 | 4.80E-01 |
| | | 345.85 | | 17.20 | 3.41E-02 | | 1.33E+00 |
| | | 482.03 | | 82.80 | -1.23E-01 | | 2.72E-01 |
| + | TA-182 | 67.75 | | 41.20 | 6.42E-02 | 2.08E-01 | 2.08E-01 |
| | | 1121.30 | | 34.90 | 8.46E-01 | | 5.20E-01 |
| | | 1189.05 | | 16.23 | -7.68E-02 | | 8.27E-01 |
| | | 1221.41 | | 26.98 | 1.33E-01 | | 5.25E-01 |
| | | 1231.02 | | 11.44 | -2.70E-02 | | 1.21E+00 |
| + | IR-192 | 308.46 | | 29.68 | 9.62E-02 | 2.61E-01 | 3.70E-01 |
| | | 468.07 | | 48.10 | 7.36E-02 | | 2.61E-01 |
| + | HG-203 | 279.19 | | 77.30 | 8.91E-02 | 2.60E-01 | 2.60E-01 |
| + | TL-204 | 374.74 | | 94.11 | 1.92E-02 | 5.37E-02 | 5.37E-02 |
| | | 899.15 | | 99.16 | -3.46E-03 | | 5.95E-02 |
| | | 911.74 | | 91.10 | 3.16E-01 | | 1.23E-01 |
| + | BI-207 | 569.67 | | 97.72 | 3.30E-02 | 5.47E-02 | 5.47E-02 |
| | | 1063.62 | | 74.90 | 9.63E-03 | | 8.10E-02 |
| + | TL-208 | 583.14 | | 30.22 | 6.50E-01 | 2.90E-01 | 2.90E-01 |
| | | 860.37 | | 4.48 | 4.48E-01 | | 1.24E+00 |
| | | 2614.66 | | 35.85 | 6.39E-01 | | 4.01E-01 |
| + | BI-210M | 262.00 | | 45.00 | 5.00E-02 | 1.03E-01 | 1.03E-01 |
| | | 300.00 | | 23.00 | -7.17E-01 | | 2.24E-01 |
| + | PB-210 | 46.50 | | 4.25 | -3.40E-01 | 9.76E-01 | 9.76E-01 |
| + | PB-211 | 404.84 | | 2.90 | 2.36E-01 | 1.58E+00 | 1.58E+00 |
| | | 831.96 | | 2.90 | -1.53E+00 | | 2.00E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 6.88E-01 | 6.75E-01 | 6.75E-01 |
| | | 1620.62 | | 2.75 | 2.28E-01 | | 1.47E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 8.95E-01 | 1.92E-01 | 1.92E-01 |
| | | 300.09 | * | 3.41 | 7.77E-01 | | 1.39E+00 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BI-214 | 609.31 | * | 46.30 | 8.50E-01 | 2.11E-01 | 2.11E-01 |
| | | 1120.29 | * | 15.10 | 1.06E+00 | | 8.00E-01 |
| | | 1764.49 | | 15.80 | 8.68E-01 | | 6.46E-01 |
| | | 2204.22 | * | 4.98 | 8.61E-01 | | 1.35E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 8.35E-01 | 1.99E-01 | 3.39E-01 |
| | | 351.92 | * | 37.19 | 9.42E-01 | | 1.99E-01 |
| + | RN-219 | 401.80 | | 6.50 | 5.59E-02 | 7.46E-01 | 7.46E-01 |
| + | RA-223 | 323.87 | | 3.88 | -4.13E-01 | 1.17E+00 | 1.17E+00 |
| + | RA-224 | 240.98 | * | 3.95 | 3.13E+00 | 2.23E+00 | 2.23E+00 |
| + | RA-225 | 40.00 | | 31.00 | -4.82E+00 | 1.41E+01 | 1.41E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 3.13E+00 | 2.39E+00 | 2.39E+00 |
| + | TH-227 | 50.10 | | 8.40 | 6.72E-02 | 4.41E-01 | 4.85E-01 |
| | | 236.00 | | 11.50 | -2.72E+00 | | 4.41E-01 |
| | | 256.20 | | 6.30 | 1.22E-01 | | 7.13E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 6.87E-01 | 3.61E-01 | 5.74E-01 |
| | | 911.07 | * | 27.70 | 9.31E-01 | | 3.61E-01 |
| | | 969.11 | * | 16.60 | 1.03E+00 | | 5.81E-01 |
| + | TH-230 | 48.44 | | 16.90 | 1.57E-01 | 2.50E-01 | 2.50E-01 |
| | | 62.85 | | 4.60 | 1.07E+00 | | 1.08E+00 |
| | | 67.67 | | 0.37 | 3.92E+00 | | 1.27E+01 |
| + | PA-231 | 283.67 | | 1.60 | -1.27E+00 | 2.11E+00 | 2.73E+00 |
| | | 302.67 | | 2.30 | -2.88E-02 | | 2.11E+00 |
| + | TH-231 | 25.64 | | 14.70 | -2.96E+00 | 3.91E-01 | 3.91E-01 |
| | | 84.21 | | 6.40 | 4.21E-02 | | 7.47E-01 |
| + | PA-233 | 311.98 | | 38.60 | -6.50E-01 | 1.38E+00 | 1.38E+00 |
| + | PA-234 | 131.20 | | 20.40 | -2.22E-02 | 1.96E-01 | 1.96E-01 |
| | | 733.99 | | 8.80 | 1.41E-01 | | 6.31E-01 |
| | | 946.00 | | 12.00 | 4.38E-02 | | 4.69E-01 |
| + | PA-234M | 1001.03 | | 0.92 | -1.08E+00 | 6.77E+00 | 6.77E+00 |
| + | TH-234 | 63.29 | | 3.80 | 1.12E+00 | 1.31E+00 | 1.31E+00 |
| + | U-235 | 143.76 | | 10.50 | -1.07E-02 | 3.77E-01 | 3.77E-01 |
| | | 163.35 | | 4.70 | 1.42E-01 | | 8.36E-01 |
| | | 205.31 | | 4.70 | -6.02E-01 | | 8.70E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 5.38E-01 | 9.77E-01 | 9.77E-01 |
| + | NP-239 | 106.10 | | 22.70 | 7.57E+10 | 7.72E+11 | 7.72E+11 |
| | | 228.18 | | 10.70 | -2.34E+11 | | 1.80E+12 |
| | | 277.60 | | 14.10 | 2.37E+10 | | 1.55E+12 |
| + | AM-241 | 59.54 | | 35.90 | -8.13E-02 | 1.24E-01 | 1.24E-01 |
| + | AM-243 | 74.67 | | 66.00 | -6.83E-02 | 9.82E-02 | 9.82E-02 |
| + | CM-243 | 209.75 | | 3.29 | 7.47E-01 | 3.31E-01 | 1.31E+00 |
| | | 228.14 | | 10.60 | -5.02E-02 | | 3.86E-01 |
| | | 277.60 | | 14.00 | 5.09E-03 | | 3.31E-01 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.48E+00 | 1.48E+00 | -6.01E-02 | 6.97E-01 |
| | NA-22 | 1274.54 | | 99.94 | 6.59E-02 | 6.59E-02 | -3.92E-03 | 3.01E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 3.30E-02 | 3.30E-02 | -7.55E-03 | 1.31E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.05E+00 | 1.05E+00 | 1.69E+01 | 5.00E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 5.00E-02 | 5.00E-02 | 1.54E-02 | 2.44E-02 |
| | | 78.34 | | 96.00 | 6.38E-02 | | 1.13E-01 | 3.13E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.31E-01 | 1.31E-01 | 3.41E-02 | 6.07E-02 |
| | | 1120.51 | | 99.99 | 2.22E-01 | | 2.79E-01 | 1.05E-01 |
| | V-48 | 983.52 | | 99.98 | 3.96E+00 | 3.96E+00 | -1.03E-01 | 1.82E+00 |
| | | 1312.10 | | 97.50 | 4.07E+00 | | 1.04E+00 | 1.83E+00 |
| | CR-51 | 320.08 | | 9.83 | 5.36E+00 | 5.36E+00 | -1.64E+00 | 2.57E+00 |
| | MN-54 | 834.83 | | 99.97 | 7.49E-02 | 7.49E-02 | 2.50E-02 | 3.51E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.40E-01 | 1.40E-01 | 3.96E-02 | 6.52E-02 |
| | | 1037.75 | | 14.03 | 1.01E+00 | | -6.85E-01 | 4.66E-01 |
| | | 1238.25 | | 67.00 | 3.01E-01 | | 2.13E-01 | 1.41E-01 |
| | | 1771.40 | | 15.51 | 6.92E-01 | | -9.38E-01 | 2.94E-01 |
| | | 2598.48 | | 16.90 | 4.27E-01 | | -3.22E-01 | 1.51E-01 |
| | CO-57 | 122.06 | | 85.51 | 5.72E-02 | 5.72E-02 | -8.48E-03 | 2.77E-02 |
| | | 136.48 | | 10.60 | 4.71E-01 | | -7.69E-02 | 2.29E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.42E-01 | 1.42E-01 | 1.95E-02 | 6.62E-02 |
| | FE-59 | 1099.22 | | 56.50 | 4.86E-01 | 4.86E-01 | -1.78E-01 | 2.23E-01 |
| | | 1291.56 | | 43.20 | 6.76E-01 | | -6.39E-02 | 3.09E-01 |
| | CO-60 | 1173.22 | | 100.00 | 7.03E-02 | 5.33E-02 | 1.12E-02 | 3.26E-02 |
| | | 1332.49 | | 100.00 | 5.33E-02 | | 3.14E-03 | 2.38E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 1.63E-01 | 1.63E-01 | -2.78E-01 | 7.53E-02 |
| | GA-67 | 93.31 | | 35.70 | 2.07E+08 | 2.07E+08 | 3.66E+08 | 1.01E+08 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | GA-67 | 208.95 | | 2.24 | 2.74E+09 | 2.07E+08 | 1.62E+09 | 1.33E+09 |
| | | 300.22 | | 16.00 | 4.45E+08 | | -9.26E+08 | 2.14E+08 |
| | SE-75 | 121.11 | | 16.70 | 4.02E-01 | 1.16E-01 | 1.86E-02 | 1.95E-01 |
| | | 136.00 | | 59.20 | 1.16E-01 | | -1.89E-02 | 5.63E-02 |
| | | 264.65 | | 59.80 | 1.38E-01 | | 5.47E-02 | 6.65E-02 |
| | | 279.53 | | 25.20 | 3.25E-01 | | 1.11E-01 | 1.56E-01 |
| | | 400.65 | | 11.40 | 7.67E-01 | | 1.98E-01 | 3.67E-01 |
| | RB-82 | 776.52 | | 13.00 | 6.24E+00 | 6.24E+00 | 1.27E+00 | 2.91E+00 |
| | RB-83 | 520.41 | | 46.00 | 2.12E-01 | 2.12E-01 | -1.92E-02 | 9.97E-02 |
| | | 529.64 | | 30.30 | 3.49E-01 | | 4.51E-02 | 1.64E-01 |
| | | 552.65 | | 16.40 | 5.53E-01 | | 5.39E-02 | 2.58E-01 |
| | KR-85 | 513.99 | | 0.43 | 1.65E+01 | 1.65E+01 | 1.89E+01 | 7.94E+00 |
| | SR-85 | 513.99 | | 99.27 | 2.05E-01 | 2.05E-01 | 2.34E-01 | 9.84E-02 |
| | Y-88 | 898.02 | | 93.40 | 1.12E-01 | 8.11E-02 | -6.61E-03 | 5.20E-02 |
| | | 1836.01 | | 99.38 | 8.11E-02 | | -4.59E-03 | 3.39E-02 |
| | MO-93 | 263.06 | | 56.72 | 8.27E-02 | 4.49E-02 | 2.23E-02 | 3.99E-02 |
| | | 684.67 | | 99.68 | 5.41E-02 | | -2.77E-02 | 2.54E-02 |
| | | 1477.11 | | 99.08 | 4.49E-02 | | 2.06E-02 | 1.94E-02 |
| | NB-93M | 16.57 | | 9.43 | 4.57E-01 | 4.57E-01 | 1.08E-01 | 2.14E-01 |
| | NB-94 | 702.63 | | 100.00 | 6.18E-02 | 4.99E-02 | 7.42E-03 | 2.92E-02 |
| | | 871.10 | | 100.00 | 4.99E-02 | | -8.00E-03 | 2.30E-02 |
| | NB-95 | 765.79 | | 99.81 | 4.83E-01 | 4.83E-01 | 4.38E-01 | 2.29E-01 |
| | NB-95M | 235.69 | | 25.00 | 3.76E+07 | 3.76E+07 | -2.32E+08 | 1.82E+07 |
| | ZR-95 | 724.18 | | 43.70 | 4.20E-01 | 3.05E-01 | -8.49E-02 | 1.98E-01 |
| | | 756.72 | | 55.30 | 3.05E-01 | | 1.71E-01 | 1.43E-01 |
| | MO-99 | 181.06 | | 6.20 | 4.69E+10 | 2.96E+10 | 9.44E+09 | 2.27E+10 |
| | | 739.58 | | 12.80 | 2.96E+10 | | -1.28E+10 | 1.38E+10 |
| | | 778.00 | | 4.50 | 8.32E+10 | | 1.54E+10 | 3.87E+10 |
| + | RU-103 | 497.08 | * | 89.00 | 3.36E-01 | 3.36E-01 | 2.67E-01 | 1.59E-01 |
| | RU-106 | 621.84 | | 9.80 | 6.13E-01 | 6.13E-01 | 2.12E-01 | 2.87E-01 |
| | AG-108M | 433.93 | | 89.90 | 5.41E-02 | 5.41E-02 | 2.23E-02 | 2.58E-02 |
| | | 614.37 | | 90.40 | 6.86E-02 | | -4.47E-01 | 3.26E-02 |
| | | 722.95 | | 90.50 | 6.19E-02 | | -1.20E-01 | 2.90E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 3.84E+00 | 3.84E+00 | 2.11E+00 | 1.90E+00 |
| | AG-110M | 657.75 | | 93.14 | 7.61E-02 | 7.61E-02 | -9.02E-02 | 3.58E-02 |
| | | 677.61 | | 10.53 | 6.41E-01 | | -3.89E-01 | 3.00E-01 |
| | | 706.67 | | 16.46 | 4.94E-01 | | 2.88E-01 | 2.34E-01 |
| | | 763.93 | | 21.98 | 3.30E-01 | | -4.65E-01 | 1.54E-01 |
| | | 884.67 | | 71.63 | 9.66E-02 | | -3.05E-02 | 4.46E-02 |
| | | 1384.27 | | 23.94 | 2.68E-01 | | 1.32E-01 | 1.19E-01 |
| | CD-113M | 263.70 | | 0.02 | 2.01E+02 | 2.01E+02 | 2.45E+01 | 9.69E+01 |
| | SN-113 | 255.12 | | 1.93 | 3.56E+00 | 1.31E-01 | -3.14E-02 | 1.70E+00 |
| | | 391.69 | | 64.90 | 1.31E-01 | | 1.94E-02 | 6.27E-02 |
| | TE123M | 159.00 | | 84.10 | 8.03E-02 | 8.03E-02 | -5.30E-02 | 3.88E-02 |
| | SB-124 | 602.71 | | 97.87 | 1.64E-01 | 1.64E-01 | 7.90E-05 | 7.71E-02 |
| | | 645.85 | | 7.26 | 2.13E+00 | | -2.06E-01 | 9.98E-01 |
| | | 722.78 | | 11.10 | 1.58E+00 | | -3.05E+00 | 7.40E-01 |
| | | 1691.02 | | 49.00 | 2.77E-01 | | 6.12E-02 | 1.18E-01 |
| | I-125 | 35.49 | | 6.49 | 2.01E+00 | 2.01E+00 | -1.07E+00 | 9.70E-01 |
| | SB-125 | 176.33 | | 6.89 | 6.14E-01 | 1.70E-01 | -1.02E-01 | 2.97E-01 |
| | | 427.89 | | 29.33 | 1.70E-01 | | 3.44E-02 | 8.06E-02 |
| | | 463.38 | | 10.35 | 5.86E-01 | | 4.77E-01 | 2.80E-01 |
| | | 600.56 | | 17.80 | 2.93E-01 | | 7.21E-02 | 1.38E-01 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | SB-125 | 635.90 | | 11.32 | 4.43E-01 | 1.70E-01 | -2.19E-01 | 2.07E-01 |
| | SB-126 | 414.70 | | 83.30 | 1.40E+01 | 1.30E+01 | 1.28E+00 | 6.64E+00 |
| | | 666.33 | | 99.60 | 1.60E+01 | | 6.23E+00 | 7.61E+00 |
| | | 695.00 | | 99.60 | 1.30E+01 | | -5.45E+00 | 6.05E+00 |
| | | 720.50 | | 53.80 | 2.57E+01 | | -3.93E+00 | 1.20E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 3.33E-01 | 3.33E-01 | 1.83E-01 | 1.65E-01 |
| | SB-127 | 473.00 | | 25.00 | 9.80E+06 | 8.42E+06 | -3.70E+06 | 4.62E+06 |
| | | 685.20 | | 35.70 | 8.42E+06 | | -4.30E+06 | 3.95E+06 |
| | | 783.80 | | 14.70 | 2.11E+07 | | 3.25E+06 | 9.82E+06 |
| | I-129 | 29.78 | | 57.00 | 8.00E-02 | 8.00E-02 | -1.50E-02 | 3.86E-02 |
| | | 33.60 | | 13.20 | 3.28E-01 | | 2.01E-01 | 1.59E-01 |
| | | 39.58 | | 7.52 | 5.52E-01 | | -2.76E-02 | 2.67E-01 |
| | I-131 | 284.30 | | 6.05 | 3.81E+03 | 3.18E+02 | -5.62E+01 | 1.83E+03 |
| | | 364.48 | | 81.20 | 3.18E+02 | | 1.62E+02 | 1.53E+02 |
| | | 636.97 | | 7.26 | 3.36E+03 | | -1.24E+03 | 1.57E+03 |
| | | 722.89 | | 1.80 | 1.60E+04 | | -3.10E+04 | 7.52E+03 |
| | TE-132 | 49.72 | | 13.10 | 4.46E+08 | 6.69E+07 | -5.00E+08 | 2.16E+08 |
| | | 228.16 | | 88.00 | 6.69E+07 | | -8.71E+06 | 3.22E+07 |
| | BA-133 | 81.00 | | 33.00 | 1.35E-01 | 1.11E-01 | -4.31E-01 | 6.60E-02 |
| | | 302.84 | | 17.80 | 2.78E-01 | | -3.78E-03 | 1.34E-01 |
| | | 356.01 | | 60.00 | 1.11E-01 | | -8.45E-03 | 5.37E-02 |
| @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | XE-133 | 81.00 | | 38.00 | 5.70E+04 | 5.70E+04 | -1.81E+05 | 2.78E+04 |
| | CS-134 | 563.23 | | 8.38 | 6.59E-01 | 6.30E-02 | -2.11E-01 | 3.11E-01 |
| | | 569.32 | | 15.43 | 3.65E-01 | | 1.03E-01 | 1.72E-01 |
| | | 604.70 | | 97.60 | 6.30E-02 | | -2.83E-03 | 2.98E-02 |
| | | 795.84 | | 85.40 | 7.77E-02 | | 6.09E-02 | 3.65E-02 |
| | | 801.93 | | 8.73 | 6.00E-01 | | -3.06E-02 | 2.77E-01 |
| | CS-135 | 268.24 | | 16.00 | 3.10E-01 | 3.10E-01 | -1.08E-02 | 1.50E-01 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CS-136 | 153.22 | | 7.46 | 1.02E+02 | 9.55E+00 | 5.45E-01 | 4.92E+01 |
| | | 163.89 | | 4.61 | 1.58E+02 | | 2.69E+01 | 7.66E+01 |
| | | 176.55 | | 13.56 | 5.41E+01 | | -9.03E+00 | 2.61E+01 |
| | | 273.65 | | 12.66 | 7.31E+01 | | 2.14E+01 | 3.53E+01 |
| | | 340.57 | | 48.50 | 2.21E+01 | | 2.70E+00 | 1.07E+01 |
| | | 818.50 | | 99.70 | 9.55E+00 | | -1.39E+00 | 4.42E+00 |
| | | 1048.07 | | 79.60 | 1.56E+01 | | 6.71E+00 | 7.27E+00 |
| | | 1235.34 | | 19.70 | 7.87E+01 | | 3.49E+00 | 3.69E+01 |
| | CS-137 | 661.65 | | 85.12 | 7.39E-02 | 7.39E-02 | 1.76E-02 | 3.50E-02 |
| | LA-138 | 788.74 | | 34.00 | 1.75E-01 | 7.24E-02 | 6.15E-02 | 8.20E-02 |
| | | 1435.80 | | 66.00 | 7.24E-02 | | 6.27E-03 | 3.18E-02 |
| | CE-139 | 165.85 | | 80.35 | 8.01E-02 | 8.01E-02 | -2.52E-02 | 3.88E-02 |
| | BA-140 | 162.64 | | 6.70 | 1.27E+02 | 4.07E+01 | 3.47E+01 | 6.13E+01 |
| | | 304.84 | | 4.50 | 2.16E+02 | | 5.07E+01 | 1.04E+02 |
| | | 423.70 | | 3.20 | 3.15E+02 | | 4.67E+01 | 1.50E+02 |
| | | 437.55 | | 2.00 | 5.04E+02 | | -5.44E+01 | 2.39E+02 |
| | | 537.32 | | 25.00 | 4.07E+01 | | 3.10E+00 | 1.92E+01 |
| | LA-140 | 328.77 | | 20.50 | 5.07E+01 | 9.41E+00 | 9.73E+00 | 2.44E+01 |
| | | 487.03 | | 45.50 | 2.40E+01 | | 1.21E+01 | 1.14E+01 |
| | | 815.85 | | 23.50 | 4.58E+01 | | -2.04E+01 | 2.11E+01 |
| | | 1596.49 | | 95.49 | 9.41E+00 | | -7.78E-01 | 4.00E+00 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| CE-141 | 145.44 | 48.40 | 6.88E-01 | 6.88E-01 | 3.78E-02 | 3.34E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 4.68E-01 | 4.68E-01 | 3.25E-02 | 2.27E-01 |
| PM-144 | 476.78 | 42.00 | 1.21E-01 | 6.29E-02 | -2.14E-02 | 5.66E-02 |
| | 618.01 | 98.60 | 6.29E-02 | | -1.24E-02 | 2.96E-02 |
| | 696.49 | 99.49 | 6.32E-02 | | 2.70E-03 | 2.96E-02 |
| PM-145 | 36.85 | 21.70 | 1.93E-01 | 1.05E-01 | -1.90E-02 | 9.35E-02 |
| | 37.36 | 39.70 | 1.05E-01 | | -1.51E-02 | 5.06E-02 |
| | 42.30 | 15.10 | 2.72E-01 | | -5.41E-02 | 1.32E-01 |
| | 72.40 | 2.31 | 2.41E+00 | | -1.34E+00 | 1.18E+00 |
| PM-146 | 453.90 | 39.94 | 1.23E-01 | 1.23E-01 | 5.11E-02 | 5.83E-02 |
| | 735.90 | 14.01 | 3.84E-01 | | -2.51E-01 | 1.79E-01 |
| | 747.13 | 13.10 | 4.19E-01 | | 2.62E-02 | 1.95E-01 |
| ND-147 | 91.11 | 28.90 | 1.00E+02 | 1.00E+02 | 2.11E+02 | 4.91E+01 |
| | 531.02 | 13.10 | 1.89E+02 | | -3.48E+01 | 8.88E+01 |
| PM-149 | 285.90 | 3.10 | 4.47E+13 | 4.47E+13 | -6.04E+12 | 2.14E+13 |
| EU-152 | 121.78 | 20.50 | 1.87E-01 | 1.87E-01 | 8.65E-03 | 9.08E-02 |
| | 244.69 | 5.40 | 8.51E-01 | | -1.83E-01 | 4.11E-01 |
| | 344.27 | 19.13 | 2.37E-01 | | 6.13E-03 | 1.13E-01 |
| | 778.89 | 9.20 | 5.82E-01 | | 1.48E-01 | 2.71E-01 |
| | 964.01 | 10.40 | 6.86E-01 | | -1.57E+00 | 3.22E-01 |
| | 1085.78 | 7.22 | 8.76E-01 | | -1.24E-01 | 4.05E-01 |
| | 1112.02 | 9.60 | 5.79E-01 | | 3.82E-02 | 2.64E-01 |
| | 1407.95 | 14.94 | 3.27E-01 | | -8.58E-02 | 1.44E-01 |
| GD-153 | 97.43 | 31.30 | 1.67E-01 | 1.67E-01 | -1.23E-01 | 8.10E-02 |
| | 103.18 | 22.20 | 2.23E-01 | | 3.45E-02 | 1.08E-01 |
| EU-154 | 123.07 | 40.50 | 9.51E-02 | 9.51E-02 | -1.05E-02 | 4.61E-02 |
| | 723.30 | 19.70 | 2.90E-01 | | -5.61E-01 | 1.36E-01 |
| | 873.19 | 11.50 | 4.53E-01 | | 9.77E-02 | 2.09E-01 |
| | 996.32 | 10.30 | 5.80E-01 | | -1.34E-01 | 2.68E-01 |
| | 1004.76 | 17.90 | 3.57E-01 | | 1.52E-01 | 1.66E-01 |
| | 1274.45 | 35.50 | 1.76E-01 | | -1.05E-02 | 8.06E-02 |
| EU-155 | 86.50 | 30.90 | 1.69E-01 | 1.69E-01 | 7.65E-02 | 8.25E-02 |
| | 105.30 | 20.70 | 1.84E-01 | | -3.63E-02 | 8.91E-02 |
| EU-156 | 811.77 | 10.40 | 4.61E+01 | 4.61E+01 | -4.58E+00 | 2.14E+01 |
| | 1153.47 | 7.20 | 8.87E+01 | | 2.09E+01 | 4.12E+01 |
| | 1230.71 | 8.90 | 7.88E+01 | | -1.76E+00 | 3.67E+01 |
| HO-166M | 184.41 | 72.60 | 7.19E-02 | 7.19E-02 | 1.28E-01 | 3.50E-02 |
| | 280.45 | 29.60 | 1.52E-01 | | 2.64E-03 | 7.29E-02 |
| | 410.94 | 11.10 | 4.29E-01 | | 2.84E-02 | 2.05E-01 |
| | 711.69 | 54.10 | 8.46E-02 | | -2.13E-02 | 3.91E-02 |
| TM-171 | 66.72 | 0.14 | 3.71E+01 | 3.71E+01 | -4.42E+01 | 1.81E+01 |
| HF-172 | 67.35 | 5.31 | 9.80E-01 | 3.78E-01 | 3.02E-01 | 4.79E-01 |
| | 125.81 | 11.30 | 3.78E-01 | | -3.18E-01 | 1.83E-01 |
| LU-172 | 181.53 | 20.60 | 5.68E+03 | 3.23E+03 | 1.14E+03 | 2.75E+03 |
| | 900.72 | 29.81 | 5.14E+03 | | -1.09E+03 | 2.38E+03 |
| | 1093.66 | 62.50 | 3.23E+03 | | 2.94E+03 | 1.51E+03 |
| LU-173 | 100.72 | 5.24 | 8.37E-01 | 2.78E-01 | -1.75E-02 | 4.07E-01 |
| | 272.11 | 21.20 | 2.78E-01 | | 1.83E-01 | 1.35E-01 |
| HF-175 | 343.40 | 84.00 | 1.38E-01 | 1.38E-01 | 3.67E-03 | 6.60E-02 |
| LU-176 | 88.34 | 13.30 | 3.89E-01 | 4.69E-02 | -2.68E-01 | 1.90E-01 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | LU-176 | 201.83 | | 86.00 | 4.82E-02 | 4.69E-02 | 0.00E+00 | 2.33E-02 |
| | | 306.78 | | 94.00 | 4.69E-02 | | 1.76E-02 | 2.25E-02 |
| | HF-181 | 133.02 | | 41.70 | 4.80E-01 | 2.72E-01 | 3.34E-02 | 2.33E-01 |
| | | 345.85 | | 17.20 | 1.33E+00 | | 3.41E-02 | 6.36E-01 |
| | | 482.03 | | 82.80 | 2.72E-01 | | -1.23E-01 | 1.28E-01 |
| | TA-182 | 67.75 | | 41.20 | 2.08E-01 | 2.08E-01 | 6.42E-02 | 1.02E-01 |
| | | 1121.30 | | 34.90 | 5.20E-01 | | 8.46E-01 | 2.47E-01 |
| | | 1189.05 | | 16.23 | 8.27E-01 | | -7.68E-02 | 3.85E-01 |
| | | 1221.41 | | 26.98 | 5.25E-01 | | 1.33E-01 | 2.45E-01 |
| | | 1231.02 | | 11.44 | 1.21E+00 | | -2.70E-02 | 5.65E-01 |
| | IR-192 | 308.46 | | 29.68 | 3.70E-01 | 2.61E-01 | 9.62E-02 | 1.77E-01 |
| | | 468.07 | | 48.10 | 2.61E-01 | | 7.36E-02 | 1.24E-01 |
| | HG-203 | 279.19 | | 77.30 | 2.60E-01 | 2.60E-01 | 8.91E-02 | 1.25E-01 |
| | TL-204 | 374.74 | | 94.11 | 5.37E-02 | 5.37E-02 | 1.92E-02 | 2.57E-02 |
| | | 899.15 | | 99.16 | 5.95E-02 | | -3.46E-03 | 2.76E-02 |
| | | 911.74 | | 91.10 | 1.23E-01 | | 3.16E-01 | 5.90E-02 |
| | BI-207 | 569.67 | | 97.72 | 5.47E-02 | 5.47E-02 | 3.30E-02 | 2.58E-02 |
| | | 1063.62 | | 74.90 | 8.10E-02 | | 9.63E-03 | 3.74E-02 |
| | TL-208 | 583.14 | | 30.22 | 2.90E-01 | 2.90E-01 | 6.50E-01 | 1.40E-01 |
| | | 860.37 | | 4.48 | 1.24E+00 | | 4.48E-01 | 5.77E-01 |
| | | 2614.66 | | 35.85 | 4.01E-01 | | 6.39E-01 | 1.88E-01 |
| | BI-210M | 262.00 | | 45.00 | 1.03E-01 | 1.03E-01 | 5.00E-02 | 4.97E-02 |
| | | 300.00 | | 23.00 | 2.24E-01 | | -7.17E-01 | 1.08E-01 |
| | PB-210 | 46.50 | | 4.25 | 9.76E-01 | 9.76E-01 | -3.40E-01 | 4.74E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.58E+00 | 1.58E+00 | 2.36E-01 | 7.52E-01 |
| | | 831.96 | | 2.90 | 2.00E+00 | | -1.53E+00 | 9.33E-01 |
| + | BI-212 | 727.17 | * | 11.80 | 6.75E-01 | 6.75E-01 | 6.88E-01 | 3.23E-01 |
| | | 1620.62 | | 2.75 | 1.47E+00 | | 2.28E-01 | 6.21E-01 |
| + | PB-212 | 238.63 | * | 44.60 | 1.92E-01 | 1.92E-01 | 8.95E-01 | 9.41E-02 |
| | | 300.09 | * | 3.41 | 1.39E+00 | | 7.77E-01 | 6.70E-01 |
| + | BI-214 | 609.31 | * | 46.30 | 2.11E-01 | 2.11E-01 | 8.50E-01 | 1.02E-01 |
| | | 1120.29 | * | 15.10 | 8.00E-01 | | 1.06E+00 | 3.84E-01 |
| | | 1764.49 | | 15.80 | 6.46E-01 | | 8.68E-01 | 3.02E-01 |
| | | 2204.22 | * | 4.98 | 1.35E+00 | | 8.61E-01 | 5.97E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 3.39E-01 | 1.99E-01 | 8.35E-01 | 1.65E-01 |
| | | 351.92 | * | 37.19 | 1.99E-01 | | 9.42E-01 | 9.66E-02 |
| | RN-219 | 401.80 | | 6.50 | 7.46E-01 | 7.46E-01 | 5.59E-02 | 3.56E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.17E+00 | 1.17E+00 | -4.13E-01 | 5.60E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 2.23E+00 | 2.23E+00 | 3.13E+00 | 1.10E+00 |
| | RA-225 | 40.00 | | 31.00 | 1.41E+01 | 1.41E+01 | -4.82E+00 | 6.81E+00 |
| + | RA-226 | 186.21 | * | 3.28 | 2.39E+00 | 2.39E+00 | 3.13E+00 | 1.18E+00 |
| | TH-227 | 50.10 | | 8.40 | 4.85E-01 | 4.41E-01 | 6.72E-02 | 2.36E-01 |
| | | 236.00 | | 11.50 | 4.41E-01 | | -2.72E+00 | 2.14E-01 |
| | | 256.20 | | 6.30 | 7.13E-01 | | 1.22E-01 | 3.44E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 5.74E-01 | 3.61E-01 | 6.87E-01 | 2.78E-01 |
| | | 911.07 | * | 27.70 | 3.61E-01 | | 9.31E-01 | 1.73E-01 |
| | | 969.11 | * | 16.60 | 5.81E-01 | | 1.03E+00 | 2.78E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.50E-01 | 2.50E-01 | 1.57E-01 | 1.22E-01 |
| | | 62.85 | | 4.60 | 1.08E+00 | | 1.07E+00 | 5.28E-01 |
| | | 67.67 | | 0.37 | 1.27E+01 | | 3.92E+00 | 6.21E+00 |
| | PA-231 | 283.67 | | 1.60 | 2.73E+00 | 2.11E+00 | -1.27E+00 | 1.31E+00 |
| | | 302.67 | | 2.30 | 2.11E+00 | | -2.88E-02 | 1.02E+00 |
| | TH-231 | 25.64 | | 14.70 | 3.91E-01 | 3.91E-01 | -2.96E+00 | 1.90E-01 |

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TH-231 | 84.21 | | 6.40 | 7.47E-01 | 3.91E-01 | 4.21E-02 | 3.65E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.38E+00 | 1.38E+00 | -6.50E-01 | 6.61E-01 |
| | PA-234 | 131.20 | | 20.40 | 1.96E-01 | 1.96E-01 | -2.22E-02 | 9.50E-02 |
| | | 733.99 | | 8.80 | 6.31E-01 | | 1.41E-01 | 2.96E-01 |
| | | 946.00 | | 12.00 | 4.69E-01 | | 4.38E-02 | 2.17E-01 |
| | PA-234M | 1001.03 | | 0.92 | 6.77E+00 | 6.77E+00 | -1.08E+00 | 3.15E+00 |
| | TH-234 | 63.29 | | 3.80 | 1.31E+00 | 1.31E+00 | 1.12E+00 | 6.43E-01 |
| | U-235 | 143.76 | | 10.50 | 3.77E-01 | 3.77E-01 | -1.07E-02 | 1.83E-01 |
| | | 163.35 | | 4.70 | 8.36E-01 | | 1.42E-01 | 4.05E-01 |
| | | 205.31 | | 4.70 | 8.70E-01 | | -6.02E-01 | 4.20E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 9.77E-01 | 9.77E-01 | 5.38E-01 | 4.84E-01 |
| | NP-239 | 106.10 | | 22.70 | 7.72E+11 | 7.72E+11 | 7.57E+10 | 3.75E+11 |
| | | 228.18 | | 10.70 | 1.80E+12 | | -2.34E+11 | 8.65E+11 |
| | | 277.60 | | 14.10 | 1.55E+12 | | 2.37E+10 | 7.45E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.24E-01 | 1.24E-01 | -8.13E-02 | 6.03E-02 |
| | AM-243 | 74.67 | | 66.00 | 9.82E-02 | 9.82E-02 | -6.83E-02 | 4.83E-02 |
| | CM-243 | 209.75 | | 3.29 | 1.31E+00 | 3.31E-01 | 7.47E-01 | 6.33E-01 |
| | | 228.14 | | 10.60 | 3.86E-01 | | -5.02E-02 | 1.86E-01 |
| | | 277.60 | | 14.00 | 3.31E-01 | | 5.09E-03 | 1.59E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

Analysis Report for 1707087-03

HTC-A03-S003-1218-01

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S003-1218-01

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 73 | 63 | 63 | 151 | 496 | 111 |
| 25: | 59 | 58 | 57 | 61 | 53 | 51 | 48 | 63 |
| 33: | 59 | 59 | 67 | 49 | 50 | 68 | 73 | 66 |
| 41: | 61 | 66 | 79 | 80 | 59 | 77 | 102 | 85 |
| 49: | 62 | 86 | 87 | 69 | 97 | 72 | 74 | 84 |
| 57: | 89 | 91 | 113 | 102 | 110 | 112 | 142 | 195 |
| 65: | 122 | 119 | 121 | 118 | 142 | 123 | 114 | 130 |
| 73: | 149 | 145 | 336 | 259 | 328 | 391 | 142 | 107 |
| 81: | 112 | 105 | 117 | 109 | 129 | 118 | 181 | 200 |
| 89: | 92 | 141 | 150 | 126 | 271 | 183 | 97 | 83 |
| 97: | 80 | 92 | 89 | 80 | 75 | 69 | 85 | 66 |
| 105: | 80 | 75 | 73 | 64 | 73 | 75 | 62 | 73 |
| 113: | 72 | 80 | 81 | 73 | 69 | 69 | 77 | 67 |
| 121: | 75 | 61 | 72 | 81 | 68 | 69 | 82 | 64 |
| 129: | 95 | 109 | 55 | 71 | 75 | 69 | 77 | 77 |
| 137: | 74 | 58 | 61 | 77 | 68 | 59 | 71 | 91 |
| 145: | 62 | 65 | 76 | 61 | 71 | 75 | 68 | 64 |
| 153: | 74 | 75 | 73 | 66 | 74 | 65 | 57 | 62 |
| 161: | 52 | 58 | 69 | 70 | 60 | 50 | 61 | 58 |
| 169: | 68 | 64 | 55 | 73 | 58 | 50 | 62 | 62 |
| 177: | 71 | 47 | 46 | 66 | 62 | 58 | 59 | 57 |
| 185: | 88 | 167 | 117 | 66 | 54 | 60 | 56 | 42 |
| 193: | 48 | 38 | 55 | 53 | 55 | 52 | 58 | 63 |
| 201: | 60 | 53 | 40 | 59 | 45 | 65 | 47 | 46 |
| 209: | 67 | 80 | 47 | 41 | 44 | 39 | 37 | 46 |
| 217: | 49 | 54 | 44 | 40 | 45 | 43 | 44 | 53 |
| 225: | 44 | 51 | 45 | 46 | 44 | 40 | 53 | 48 |
| 233: | 47 | 49 | 46 | 40 | 56 | 155 | 463 | 190 |
| 241: | 87 | 108 | 91 | 62 | 40 | 35 | 34 | 35 |
| 249: | 42 | 39 | 27 | 29 | 33 | 38 | 33 | 39 |
| 257: | 30 | 30 | 37 | 35 | 26 | 42 | 37 | 35 |
| 265: | 39 | 33 | 29 | 34 | 28 | 56 | 66 | 34 |
| 273: | 38 | 36 | 34 | 32 | 36 | 37 | 28 | 35 |
| 281: | 27 | 39 | 25 | 23 | 29 | 27 | 29 | 36 |
| 289: | 32 | 26 | 29 | 41 | 25 | 40 | 121 | 167 |
| 297: | 41 | 34 | 37 | 44 | 47 | 31 | 25 | 25 |
| 305: | 23 | 31 | 22 | 35 | 20 | 26 | 21 | 19 |
| 313: | 23 | 20 | 30 | 25 | 26 | 27 | 30 | 15 |
| 321: | 21 | 30 | 22 | 27 | 27 | 25 | 26 | 44 |
| 329: | 23 | 26 | 33 | 21 | 26 | 26 | 33 | 15 |
| 337: | 30 | 56 | 92 | 35 | 19 | 22 | 24 | 26 |
| 345: | 17 | 23 | 19 | 27 | 25 | 27 | 71 | 246 |
| 353: | 179 | 36 | 24 | 27 | 25 | 16 | 23 | 23 |
| 361: | 20 | 25 | 33 | 29 | 26 | 24 | 23 | 24 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 21 | 22 | 10 | 18 | 22 | 17 | 24 | 28 |

Sample Title: HTC-A03-S003-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 25 | 28 | 23 | 24 | 27 | 17 | 19 | 23 |
| 385: | 22 | 17 | 19 | 23 | 17 | 19 | 27 | 15 |
| 393: | 19 | 26 | 21 | 21 | 15 | 23 | 22 | 24 |
| 401: | 25 | 24 | 17 | 19 | 17 | 25 | 18 | 10 |
| 409: | 19 | 35 | 23 | 22 | 16 | 13 | 18 | 17 |
| 417: | 22 | 16 | 17 | 20 | 20 | 14 | 17 | 15 |
| 425: | 20 | 20 | 20 | 12 | 19 | 18 | 14 | 13 |
| 433: | 19 | 28 | 18 | 18 | 22 | 12 | 14 | 19 |
| 441: | 17 | 10 | 18 | 15 | 16 | 15 | 15 | 13 |
| 449: | 17 | 9 | 13 | 15 | 23 | 18 | 16 | 17 |
| 457: | 15 | 20 | 8 | 17 | 11 | 35 | 46 | 20 |
| 465: | 21 | 13 | 18 | 22 | 15 | 14 | 19 | 13 |
| 473: | 13 | 11 | 11 | 9 | 12 | 15 | 17 | 8 |
| 481: | 14 | 12 | 14 | 16 | 12 | 21 | 16 | 13 |
| 489: | 20 | 22 | 15 | 12 | 6 | 18 | 17 | 16 |
| 497: | 20 | 22 | 15 | 12 | 11 | 14 | 19 | 8 |
| 505: | 22 | 13 | 15 | 13 | 25 | 61 | 77 | 55 |
| 513: | 23 | 24 | 12 | 13 | 15 | 14 | 10 | 10 |
| 521: | 13 | 8 | 12 | 13 | 11 | 13 | 13 | 6 |
| 529: | 12 | 16 | 18 | 13 | 14 | 11 | 14 | 16 |
| 537: | 10 | 13 | 9 | 15 | 13 | 9 | 14 | 16 |
| 545: | 11 | 12 | 14 | 15 | 18 | 13 | 12 | 14 |
| 553: | 7 | 4 | 5 | 7 | 19 | 22 | 11 | 11 |
| 561: | 18 | 13 | 13 | 17 | 13 | 9 | 13 | 17 |
| 569: | 18 | 19 | 8 | 12 | 16 | 10 | 10 | 13 |
| 577: | 13 | 16 | 13 | 9 | 8 | 30 | 115 | 80 |
| 585: | 28 | 13 | 10 | 19 | 7 | 15 | 11 | 15 |
| 593: | 8 | 6 | 7 | 10 | 11 | 11 | 16 | 8 |
| 601: | 18 | 11 | 8 | 7 | 13 | 22 | 12 | 32 |
| 609: | 154 | 179 | 28 | 17 | 21 | 16 | 13 | 15 |
| 617: | 16 | 9 | 13 | 7 | 11 | 8 | 12 | 16 |
| 625: | 11 | 6 | 9 | 10 | 11 | 7 | 14 | 10 |
| 633: | 10 | 7 | 11 | 10 | 14 | 8 | 6 | 11 |
| 641: | 14 | 12 | 14 | 8 | 12 | 12 | 9 | 9 |
| 649: | 8 | 11 | 8 | 6 | 11 | 15 | 11 | 8 |
| 657: | 16 | 13 | 9 | 16 | 11 | 24 | 26 | 10 |
| 665: | 18 | 16 | 13 | 15 | 15 | 8 | 13 | 5 |
| 673: | 13 | 16 | 10 | 11 | 12 | 7 | 7 | 12 |
| 681: | 13 | 14 | 13 | 9 | 15 | 4 | 9 | 12 |
| 689: | 17 | 13 | 13 | 11 | 13 | 15 | 11 | 4 |
| 697: | 7 | 6 | 15 | 8 | 9 | 19 | 13 | 19 |
| 705: | 16 | 17 | 18 | 15 | 6 | 9 | 12 | 2 |
| 713: | 7 | 5 | 11 | 5 | 7 | 18 | 14 | 8 |
| 721: | 11 | 5 | 10 | 15 | 12 | 17 | 29 | 32 |
| 729: | 10 | 10 | 10 | 13 | 9 | 9 | 14 | 14 |
| 737: | 6 | 7 | 6 | 10 | 18 | 8 | 13 | 10 |
| 745: | 11 | 7 | 7 | 13 | 9 | 9 | 5 | 11 |
| 753: | 7 | 12 | 10 | 14 | 15 | 7 | 7 | 12 |
| 761: | 8 | 5 | 12 | 13 | 11 | 11 | 9 | 26 |
| 769: | 25 | 11 | 11 | 10 | 12 | 4 | 8 | 12 |
| 777: | 11 | 12 | 8 | 6 | 4 | 8 | 7 | 9 |
| 785: | 8 | 12 | 17 | 12 | 8 | 8 | 13 | 7 |
| 793: | 12 | 14 | 22 | 10 | 12 | 4 | 5 | 6 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 3 | 8 | 4 | 12 | 9 | 8 | 12 | 11 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 4 | 9 | 11 | 10 | 6 | 8 | 7 | 5 |
| 817: | 7 | 7 | 10 | 9 | 8 | 7 | 12 | 8 |
| 825: | 9 | 6 | 10 | 14 | 10 | 10 | 12 | 10 |
| 833: | 5 | 6 | 14 | 21 | 10 | 6 | 5 | 7 |
| 841: | 17 | 11 | 4 | 10 | 8 | 10 | 12 | 7 |
| 849: | 9 | 10 | 9 | 7 | 4 | 7 | 4 | 7 |
| 857: | 7 | 4 | 8 | 13 | 13 | 5 | 8 | 7 |
| 865: | 7 | 5 | 6 | 4 | 11 | 3 | 8 | 7 |
| 873: | 5 | 7 | 12 | 5 | 5 | 3 | 4 | 6 |
| 881: | 9 | 12 | 7 | 4 | 5 | 9 | 3 | 13 |
| 889: | 9 | 6 | 10 | 9 | 7 | 11 | 7 | 10 |
| 897: | 6 | 6 | 6 | 9 | 9 | 9 | 5 | 10 |
| 905: | 6 | 3 | 5 | 9 | 13 | 22 | 66 | 67 |
| 913: | 20 | 11 | 3 | 5 | 6 | 12 | 5 | 4 |
| 921: | 7 | 5 | 4 | 11 | 12 | 6 | 6 | 7 |
| 929: | 7 | 4 | 9 | 5 | 8 | 20 | 6 | 10 |
| 937: | 9 | 11 | 3 | 6 | 6 | 6 | 6 | 7 |
| 945: | 8 | 5 | 8 | 7 | 10 | 7 | 8 | 6 |
| 953: | 8 | 10 | 5 | 6 | 5 | 6 | 9 | 10 |
| 961: | 4 | 8 | 6 | 14 | 24 | 13 | 11 | 30 |
| 969: | 57 | 30 | 6 | 12 | 6 | 3 | 10 | 8 |
| 977: | 6 | 5 | 7 | 6 | 4 | 5 | 7 | 5 |
| 985: | 10 | 6 | 8 | 5 | 8 | 7 | 8 | 4 |
| 993: | 9 | 5 | 5 | 10 | 4 | 8 | 10 | 8 |
| 1001: | 13 | 9 | 5 | 5 | 10 | 11 | 5 | 5 |
| 1009: | 3 | 5 | 7 | 3 | 8 | 11 | 10 | 7 |
| 1017: | 10 | 6 | 5 | 4 | 5 | 11 | 8 | 6 |
| 1025: | 12 | 3 | 7 | 11 | 2 | 5 | 8 | 9 |
| 1033: | 10 | 10 | 10 | 5 | 4 | 5 | 9 | 6 |
| 1041: | 10 | 12 | 4 | 8 | 11 | 8 | 8 | 9 |
| 1049: | 7 | 8 | 12 | 9 | 5 | 6 | 8 | 8 |
| 1057: | 11 | 4 | 3 | 7 | 8 | 8 | 4 | 6 |
| 1065: | 12 | 4 | 11 | 6 | 8 | 5 | 5 | 5 |
| 1073: | 4 | 4 | 9 | 5 | 9 | 2 | 4 | 6 |
| 1081: | 5 | 6 | 9 | 11 | 7 | 13 | 1 | 4 |
| 1089: | 6 | 13 | 8 | 6 | 9 | 8 | 11 | 11 |
| 1097: | 1 | 6 | 7 | 5 | 9 | 5 | 4 | 10 |
| 1105: | 6 | 6 | 7 | 5 | 6 | 3 | 8 | 4 |
| 1113: | 4 | 4 | 8 | 11 | 6 | 12 | 22 | 32 |
| 1121: | 32 | 12 | 10 | 11 | 3 | 5 | 2 | 12 |
| 1129: | 11 | 5 | 10 | 8 | 12 | 8 | 11 | 12 |
| 1137: | 9 | 7 | 4 | 6 | 8 | 5 | 4 | 12 |
| 1145: | 7 | 6 | 3 | 9 | 1 | 5 | 9 | 6 |
| 1153: | 7 | 9 | 7 | 15 | 8 | 10 | 6 | 6 |
| 1161: | 4 | 7 | 6 | 7 | 7 | 10 | 7 | 9 |
| 1169: | 8 | 9 | 5 | 7 | 6 | 8 | 10 | 9 |
| 1177: | 5 | 6 | 6 | 4 | 6 | 7 | 4 | 10 |
| 1185: | 8 | 7 | 5 | 11 | 6 | 15 | 10 | 9 |
| 1193: | 10 | 10 | 9 | 8 | 9 | 7 | 9 | 9 |
| 1201: | 6 | 7 | 11 | 4 | 6 | 8 | 7 | 6 |
| 1209: | 9 | 9 | 9 | 14 | 5 | 7 | 7 | 9 |
| 1217: | 5 | 10 | 9 | 17 | 8 | 11 | 6 | 7 |
| 1225: | 8 | 10 | 6 | 8 | 11 | 9 | 9 | 13 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 8 | 8 | 11 | 6 | 18 | 14 | 11 | 14 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 5 | 6 | 6 | 5 | 11 | 6 | 6 | 9 |
| 1249: | 6 | 12 | 2 | 5 | 5 | 6 | 4 | 6 |
| 1257: | 4 | 8 | 2 | 0 | 6 | 4 | 6 | 2 |
| 1265: | 6 | 6 | 6 | 5 | 6 | 9 | 7 | 4 |
| 1273: | 7 | 5 | 7 | 3 | 5 | 4 | 5 | 8 |
| 1281: | 12 | 10 | 5 | 5 | 4 | 6 | 6 | 13 |
| 1289: | 2 | 10 | 4 | 3 | 4 | 3 | 4 | 8 |
| 1297: | 5 | 2 | 2 | 3 | 6 | 4 | 3 | 7 |
| 1305: | 4 | 6 | 3 | 5 | 7 | 4 | 2 | 3 |
| 1313: | 3 | 3 | 3 | 1 | 5 | 9 | 7 | 6 |
| 1321: | 3 | 6 | 6 | 4 | 0 | 5 | 5 | 2 |
| 1329: | 2 | 6 | 1 | 3 | 6 | 5 | 1 | 3 |
| 1337: | 3 | 2 | 7 | 3 | 5 | 5 | 5 | 2 |
| 1345: | 6 | 7 | 3 | 2 | 5 | 3 | 3 | 3 |
| 1353: | 3 | 2 | 1 | 7 | 1 | 2 | 3 | 5 |
| 1361: | 4 | 2 | 3 | 2 | 2 | 6 | 2 | 4 |
| 1369: | 2 | 4 | 2 | 3 | 2 | 3 | 2 | 3 |
| 1377: | 11 | 8 | 4 | 0 | 0 | 4 | 2 | 6 |
| 1385: | 4 | 0 | 4 | 1 | 0 | 0 | 3 | 3 |
| 1393: | 3 | 4 | 3 | 2 | 7 | 4 | 4 | 1 |
| 1401: | 3 | 8 | 1 | 3 | 4 | 1 | 4 | 3 |
| 1409: | 3 | 1 | 2 | 4 | 4 | 2 | 3 | 0 |
| 1417: | 4 | 1 | 3 | 0 | 3 | 2 | 5 | 3 |
| 1425: | 2 | 5 | 2 | 3 | 2 | 1 | 3 | 3 |
| 1433: | 2 | 3 | 4 | 0 | 4 | 2 | 3 | 2 |
| 1441: | 1 | 0 | 3 | 1 | 1 | 4 | 2 | 5 |
| 1449: | 2 | 1 | 4 | 5 | 1 | 2 | 2 | 2 |
| 1457: | 7 | 13 | 69 | 259 | 358 | 127 | 28 | 14 |
| 1465: | 10 | 8 | 6 | 2 | 2 | 3 | 0 | 2 |
| 1473: | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 1481: | 0 | 2 | 2 | 2 | 3 | 3 | 1 | 1 |
| 1489: | 2 | 4 | 3 | 0 | 3 | 0 | 2 | 4 |
| 1497: | 2 | 1 | 2 | 1 | 2 | 4 | 3 | 2 |
| 1505: | 2 | 3 | 5 | 4 | 7 | 6 | 4 | 0 |
| 1513: | 3 | 4 | 1 | 1 | 0 | 0 | 3 | 0 |
| 1521: | 6 | 1 | 0 | 2 | 1 | 2 | 4 | 0 |
| 1529: | 5 | 1 | 1 | 1 | 1 | 3 | 2 | 2 |
| 1537: | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 0 |
| 1545: | 2 | 1 | 2 | 0 | 2 | 1 | 0 | 1 |
| 1553: | 4 | 5 | 2 | 4 | 2 | 1 | 1 | 2 |
| 1561: | 0 | 3 | 0 | 1 | 2 | 1 | 2 | 2 |
| 1569: | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 |
| 1577: | 4 | 2 | 3 | 4 | 3 | 2 | 2 | 5 |
| 1585: | 3 | 1 | 5 | 4 | 1 | 0 | 5 | 7 |
| 1593: | 5 | 2 | 0 | 1 | 2 | 1 | 0 | 1 |
| 1601: | 2 | 2 | 0 | 2 | 1 | 0 | 2 | 2 |
| 1609: | 1 | 3 | 0 | 1 | 2 | 1 | 1 | 2 |
| 1617: | 2 | 1 | 1 | 3 | 1 | 2 | 0 | 2 |
| 1625: | 2 | 1 | 6 | 0 | 5 | 7 | 0 | 0 |
| 1633: | 0 | 3 | 1 | 0 | 0 | 1 | 2 | 2 |
| 1641: | 2 | 1 | 3 | 1 | 2 | 1 | 3 | 1 |
| 1649: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1657: | 2 | 1 | 0 | 4 | 1 | 2 | 2 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 1 | 4 | 2 | 3 | 1 | 3 | 1 | 1 |
| 1681: | 2 | 1 | 0 | 1 | 2 | 0 | 2 | 2 |
| 1689: | 2 | 1 | 1 | 1 | 2 | 2 | 0 | 1 |
| 1697: | 3 | 1 | 0 | 0 | 1 | 1 | 1 | 5 |
| 1705: | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1713: | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 0 |
| 1721: | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 3 |
| 1729: | 4 | 3 | 4 | 1 | 1 | 1 | 1 | 4 |
| 1737: | 1 | 2 | 0 | 3 | 1 | 0 | 2 | 1 |
| 1745: | 0 | 2 | 3 | 2 | 0 | 0 | 0 | 0 |
| 1753: | 1 | 1 | 1 | 0 | 0 | 3 | 0 | 0 |
| 1761: | 2 | 2 | 18 | 21 | 18 | 8 | 2 | 3 |
| 1769: | 2 | 1 | 2 | 0 | 1 | 2 | 1 | 0 |
| 1777: | 1 | 1 | 2 | 1 | 0 | 2 | 0 | 1 |
| 1785: | 0 | 1 | 2 | 0 | 2 | 0 | 1 | 0 |
| 1793: | 1 | 1 | 1 | 2 | 4 | 1 | 0 | 0 |
| 1801: | 1 | 2 | 2 | 1 | 0 | 2 | 2 | 0 |
| 1809: | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 2 |
| 1817: | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 2 |
| 1825: | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 1 |
| 1833: | 2 | 0 | 2 | 1 | 1 | 2 | 1 | 0 |
| 1841: | 1 | 0 | 1 | 1 | 4 | 3 | 3 | 2 |
| 1849: | 1 | 2 | 1 | 1 | 1 | 3 | 0 | 0 |
| 1857: | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 2 |
| 1865: | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 |
| 1873: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1881: | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 3 |
| 1889: | 6 | 2 | 1 | 1 | 0 | 1 | 2 | 0 |
| 1897: | 4 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| 1905: | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 0 |
| 1913: | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 1 |
| 1921: | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| 1929: | 1 | 0 | 0 | 0 | 2 | 1 | 3 | 1 |
| 1937: | 2 | 0 | 2 | 3 | 0 | 1 | 2 | 0 |
| 1945: | 4 | 0 | 2 | 2 | 1 | 1 | 0 | 0 |
| 1953: | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 1 |
| 1961: | 1 | 2 | 2 | 1 | 3 | 0 | 0 | 1 |
| 1969: | 0 | 0 | 0 | 1 | 4 | 1 | 2 | 0 |
| 1977: | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 |
| 1985: | 0 | 1 | 3 | 1 | 0 | 0 | 1 | 0 |
| 1993: | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 0 |
| 2001: | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 1 |
| 2009: | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 |
| 2017: | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 |
| 2025: | 0 | 1 | 2 | 0 | 1 | 1 | 2 | 0 |
| 2033: | 1 | 1 | 1 | 2 | 2 | 3 | 1 | 1 |
| 2041: | 1 | 2 | 2 | 1 | 0 | 1 | 1 | 0 |
| 2049: | 2 | 2 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2057: | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 2065: | 0 | 0 | 0 | 1 | 0 | 1 | 4 | 0 |
| 2073: | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 1 |
| 2081: | 1 | 1 | 0 | 2 | 0 | 2 | 1 | 0 |
| 2089: | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 0 | 2 | 1 | 1 | 3 | 4 | 5 | 5 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 1 | 1 | 1 | 2 | 2 | 0 | 0 | 0 |
| 2113: | 0 | 3 | 3 | 1 | 1 | 5 | 3 | 1 |
| 2121: | 3 | 1 | 0 | 2 | 0 | 1 | 0 | 2 |
| 2129: | 0 | 3 | 1 | 2 | 0 | 0 | 0 | 2 |
| 2137: | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2145: | 1 | 1 | 0 | 2 | 1 | 3 | 1 | 0 |
| 2153: | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 |
| 2161: | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 |
| 2169: | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 |
| 2177: | 1 | 0 | 0 | 2 | 0 | 3 | 0 | 0 |
| 2185: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 2193: | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 1 |
| 2201: | 0 | 4 | 7 | 5 | 1 | 5 | 2 | 1 |
| 2209: | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 1 |
| 2217: | 2 | 3 | 1 | 1 | 1 | 4 | 0 | 0 |
| 2225: | 1 | 2 | 3 | 0 | 2 | 2 | 2 | 0 |
| 2233: | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2241: | 1 | 2 | 3 | 3 | 1 | 0 | 0 | 1 |
| 2249: | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 2257: | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 2265: | 2 | 1 | 1 | 1 | 0 | 0 | 5 | 2 |
| 2273: | 2 | 1 | 0 | 1 | 1 | 1 | 0 | 3 |
| 2281: | 0 | 0 | 2 | 2 | 1 | 1 | 0 | 1 |
| 2289: | 1 | 3 | 2 | 0 | 2 | 0 | 0 | 2 |
| 2297: | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 0 |
| 2305: | 1 | 1 | 5 | 0 | 1 | 1 | 0 | 0 |
| 2313: | 1 | 0 | 2 | 1 | 2 | 1 | 2 | 0 |
| 2321: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2329: | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 2 |
| 2337: | 0 | 1 | 2 | 1 | 2 | 3 | 1 | 0 |
| 2345: | 1 | 3 | 2 | 2 | 2 | 0 | 1 | 1 |
| 2353: | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 2361: | 2 | 0 | 0 | 0 | 2 | 2 | 0 | 1 |
| 2369: | 0 | 2 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2377: | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 1 |
| 2385: | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 2 |
| 2393: | 1 | 1 | 0 | 1 | 0 | 3 | 1 | 0 |
| 2401: | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 0 |
| 2409: | 0 | 1 | 3 | 1 | 1 | 0 | 1 | 0 |
| 2417: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2425: | 0 | 1 | 0 | 1 | 2 | 3 | 0 | 3 |
| 2433: | 2 | 0 | 3 | 0 | 2 | 1 | 0 | 0 |
| 2441: | 2 | 1 | 1 | 1 | 0 | 2 | 2 | 1 |
| 2449: | 0 | 2 | 3 | 0 | 3 | 1 | 0 | 1 |
| 2457: | 1 | 0 | 1 | 1 | 2 | 1 | 3 | 1 |
| 2465: | 0 | 0 | 2 | 0 | 0 | 0 | 3 | 1 |
| 2473: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2481: | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 1 |
| 2489: | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2497: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2505: | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 0 |
| 2513: | 0 | 1 | 0 | 1 | 1 | 0 | 3 | 1 |
| 2521: | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2545: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2553: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2561: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2569: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2577: | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 0 |
| 2585: | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2593: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2601: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2609: | 0 | 1 | 4 | 7 | 21 | 29 | 10 | 6 |
| 2617: | 1 | 3 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2625: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2633: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 1 |
| 2649: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 2665: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2673: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2681: | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 0 |
| 2689: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2697: | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 1 |
| 2705: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2713: | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2721: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2729: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2737: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2745: | 0 | 3 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2761: | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2785: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2793: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2801: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2809: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2817: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2841: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2849: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2857: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2865: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2873: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2881: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2889: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2897: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2905: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2929: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| 2937: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2945: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2977: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3009: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3017: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3049: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3065: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3073: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 |
| 3137: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3153: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3185: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3193: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3217: | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3233: | 0 | 0 | 0 | 2 | 1 | 1 | 1 | 1 |
| 3241: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3273: | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3281: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-1218-01

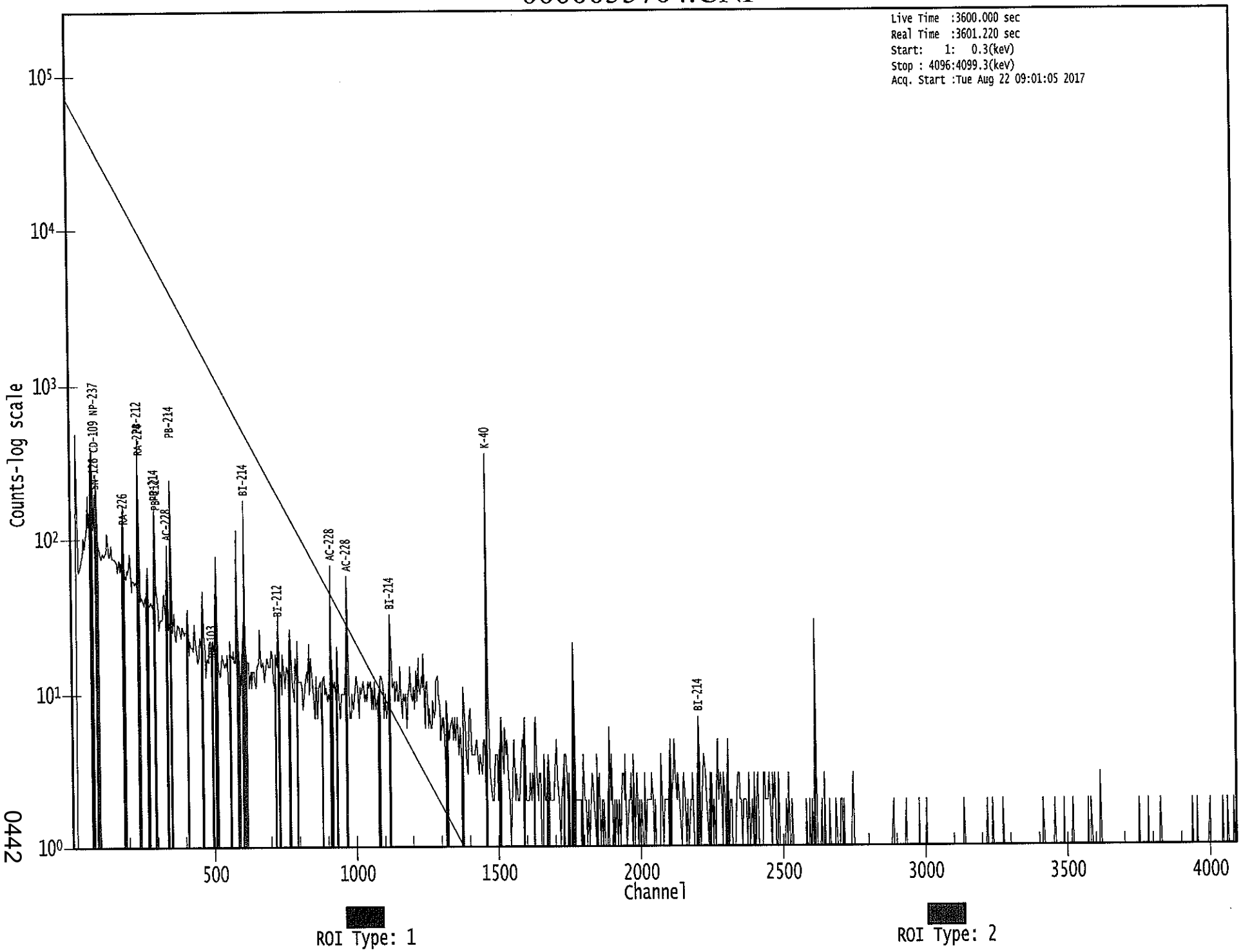
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3409: | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| 3417: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3441: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 3449: | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| 3457: | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3465: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3497: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 1 | 0 | 0 | 1 | 0 | 3 | 0 | 0 |
| 3617: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3729: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3737: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |

Sample Title: HTC-A03-S003-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3841: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3849: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 3865: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 4065: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

# 0000055704.CNF




0442

8/22

Apex-Gamma

Analysis Report for 1707087-04
HTC-A03-S002-0006-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-04 |
| Sample Description | : HTC-A03-S002-0006-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.958E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:41:31AM |
| Acquisition Started | : 8/22/2017 10:04:03AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE1 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.2 seconds |
| Dead Time | : 0.03 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 19 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55708 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 11:04:07AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 62.94 | 63.55 | 0.0000 | 0.00 |
| 2 | 74.56 | 75.15 | 0.0000 | 0.00 |
| 3 | 77.26 | 77.85 | 0.0000 | 0.00 |
| 4 | 87.27 | 87.85 | 0.0000 | 0.00 |
| 5 | 92.30 | 92.87 | 0.0000 | 0.00 |
| 6 | 104.70 | 105.26 | 0.0000 | 0.00 |
| 7 | 185.94 | 186.42 | 0.0000 | 0.00 |
| 8 | 209.47 | 209.92 | 0.0000 | 0.00 |
| 9 | 238.65 | 239.08 | 0.0000 | 0.00 |
| 10 | 242.23 | 242.65 | 0.0000 | 0.00 |
| 11 | 269.97 | 270.37 | 0.0000 | 0.00 |
| 12 | 276.21 | 276.60 | 0.0000 | 0.00 |
| 13 | 295.46 | 295.83 | 0.0000 | 0.00 |
| 14 | 299.81 | 300.17 | 0.0000 | 0.00 |
| 15 | 327.49 | 327.82 | 0.0000 | 0.00 |
| 16 | 338.69 | 339.01 | 0.0000 | 0.00 |
| 17 | 345.04 | 345.36 | 0.0000 | 0.00 |
| 18 | 351.98 | 352.29 | 0.0000 | 0.00 |
| 19 | 361.33 | 361.64 | 0.0000 | 0.00 |
| 20 | 463.47 | 463.67 | 0.0000 | 0.00 |
| 21 | 510.72 | 510.87 | 0.0000 | 0.00 |
| 22 | 569.06 | 569.15 | 0.0000 | 0.00 |
| 23 | 583.02 | 583.10 | 0.0000 | 0.00 |
| 24 | 609.36 | 609.41 | 0.0000 | 0.00 |
| 25 | 727.95 | 727.88 | 0.0000 | 0.00 |
| 26 | 770.01 | 769.90 | 0.0000 | 0.00 |
| 27 | 794.93 | 794.79 | 0.0000 | 0.00 |
| 28 | 826.74 | 826.57 | 0.0000 | 0.00 |
| 29 | 837.72 | 837.54 | 0.0000 | 0.00 |
| 30 | 860.90 | 860.70 | 0.0000 | 0.00 |
| 31 | 895.24 | 895.00 | 0.0000 | 0.00 |
| 32 | 911.45 | 911.20 | 0.0000 | 0.00 |
| 33 | 964.76 | 964.45 | 0.0000 | 0.00 |
| 34 | 969.25 | 968.94 | 0.0000 | 0.00 |
| 35 | 972.98 | 972.67 | 0.0000 | 0.00 |
| 36 | 1045.73 | 1045.34 | 0.0000 | 0.00 |
| 37 | 1121.16 | 1120.70 | 0.0000 | 0.00 |
| 38 | 1214.85 | 1214.30 | 0.0000 | 0.00 |
| 39 | 1237.50 | 1236.92 | 0.0000 | 0.00 |
| 40 | 1377.44 | 1376.73 | 0.0000 | 0.00 |
| 41 | 1409.55 | 1408.80 | 0.0000 | 0.00 |
| 42 | 1461.47 | 1460.68 | 0.0000 | 0.00 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1589.45 | 1588.53 | 0.0000 | 0.00 |
| 44 | 1593.39 | 1592.47 | 0.0000 | 0.00 |
| 45 | 1621.72 | 1620.77 | 0.0000 | 0.00 |
| 46 | 1635.43 | 1634.46 | 0.0000 | 0.00 |
| 47 | 1694.86 | 1693.83 | 0.0000 | 0.00 |
| 48 | 1730.28 | 1729.23 | 0.0000 | 0.00 |
| 49 | 1733.29 | 1732.23 | 0.0000 | 0.00 |
| 50 | 1765.23 | 1764.13 | 0.0000 | 0.00 |
| 51 | 1847.42 | 1846.24 | 0.0000 | 0.00 |
| 52 | 1966.99 | 1965.70 | 0.0000 | 0.00 |
| 53 | 2017.36 | 2016.03 | 0.0000 | 0.00 |
| 54 | 2058.26 | 2056.89 | 0.0000 | 0.00 |
| 55 | 2105.57 | 2104.14 | 0.0000 | 0.00 |
| 56 | 2204.62 | 2203.11 | 0.0000 | 0.00 |
| 57 | 2209.44 | 2207.91 | 0.0000 | 0.00 |
| 58 | 2281.41 | 2279.82 | 0.0000 | 0.00 |
| 59 | 2309.92 | 2308.31 | 0.0000 | 0.00 |
| 60 | 2345.77 | 2344.12 | 0.0000 | 0.00 |
| 61 | 2448.77 | 2447.02 | 0.0000 | 0.00 |
| 62 | 2615.21 | 2613.30 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 11:04:07AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 62.94 | 60 - | 66 | 63.55 | 2.01E+02 | 94.82 | 1.50E+03 | 1.29 |
| M | 2 | 74.56 | 71 - | 81 | 75.15 | 2.84E+02 | 86.02 | 1.19E+03 | 1.65 |
| m | 3 | 77.26 | 71 - | 81 | 77.85 | 4.81E+02 | 91.47 | 1.19E+03 | 1.65 |
| M | 4 | 87.27 | 83 - | 96 | 87.85 | 1.31E+02 | 74.40 | 1.05E+03 | 1.67 |
| m | 5 | 92.30 | 83 - | 96 | 92.87 | 3.07E+02 | 76.60 | 9.68E+02 | 1.67 |
| | 6 | 104.70 | 103 - | 107 | 105.26 | 4.83E+01 | 57.18 | 6.91E+02 | 1.80 |
| | 7 | 185.94 | 183 - | 190 | 186.42 | 1.69E+02 | 76.47 | 8.57E+02 | 1.76 |
| | 8 | 209.47 | 207 - | 213 | 209.92 | 7.57E+01 | 61.88 | 6.43E+02 | 1.40 |
| M | 9 | 238.65 | 233 - | 248 | 239.08 | 7.29E+02 | 70.17 | 4.55E+02 | 1.70 |
| m | 10 | 242.23 | 233 - | 248 | 242.65 | 1.83E+02 | 62.39 | 4.88E+02 | 2.01 |
| | 11 | 269.97 | 267 - | 273 | 270.37 | 6.49E+01 | 50.82 | 4.20E+02 | 1.95 |
| | 12 | 276.21 | 274 - | 280 | 276.60 | 6.54E+01 | 49.97 | 4.07E+02 | 3.92 |
| M | 13 | 295.46 | 292 - | 304 | 295.83 | 2.63E+02 | 51.45 | 3.39E+02 | 1.87 |
| m | 14 | 299.81 | 292 - | 304 | 300.17 | 4.78E+01 | 43.58 | 2.66E+02 | 1.87 |
| | 15 | 327.49 | 324 - | 332 | 327.82 | 5.50E+01 | 53.05 | 3.96E+02 | 2.00 |
| | 16 | 338.69 | 335 - | 342 | 339.01 | 1.44E+02 | 52.50 | 3.62E+02 | 1.96 |
| M | 17 | 345.04 | 343 - | 366 | 345.36 | 4.32E+01 | 27.50 | 1.60E+02 | 2.09 |
| m | 18 | 351.98 | 343 - | 366 | 352.29 | 4.66E+02 | 51.27 | 1.70E+02 | 1.81 |
| m | 19 | 361.33 | 343 - | 366 | 361.64 | 2.15E+01 | 33.05 | 1.71E+02 | 2.10 |
| | 20 | 463.47 | 460 - | 468 | 463.67 | 6.44E+01 | 43.57 | 2.53E+02 | 1.75 |
| | 21 | 510.72 | 505 - | 516 | 510.87 | 2.04E+02 | 54.99 | 2.76E+02 | 1.96 |
| | 22 | 569.06 | 567 - | 572 | 569.15 | 2.28E+01 | 25.98 | 1.16E+02 | 2.88 |
| | 23 | 583.02 | 577 - | 587 | 583.10 | 2.52E+02 | 52.33 | 2.31E+02 | 2.13 |
| | 24 | 609.36 | 605 - | 614 | 609.41 | 3.28E+02 | 56.33 | 2.69E+02 | 2.09 |
| | 25 | 727.95 | 725 - | 731 | 727.88 | 3.63E+01 | 31.09 | 1.47E+02 | 1.87 |
| | 26 | 770.01 | 765 - | 776 | 769.90 | 5.28E+01 | 39.40 | 1.66E+02 | 5.62 |
| | 27 | 794.93 | 791 - | 799 | 794.79 | 3.71E+01 | 30.11 | 1.16E+02 | 1.46 |
| | 28 | 826.74 | 819 - | 832 | 826.57 | 3.73E+01 | 39.17 | 1.53E+02 | 10.73 |
| | 29 | 837.72 | 833 - | 841 | 837.54 | 4.93E+01 | 28.45 | 9.34E+01 | 5.47 |
| | 30 | 860.90 | 857 - | 866 | 860.70 | 3.31E+01 | 30.58 | 1.14E+02 | 2.74 |
| M | 31 | 895.24 | 894 - | 917 | 895.00 | 1.67E+01 | 9.80 | 2.03E+01 | 1.99 |
| m | 32 | 911.45 | 894 - | 917 | 911.20 | 1.88E+02 | 33.53 | 7.37E+01 | 2.14 |
| M | 33 | 964.76 | 959 - | 980 | 964.45 | 4.09E+01 | 25.01 | 9.52E+01 | 2.39 |
| m | 34 | 969.25 | 959 - | 980 | 968.94 | 1.11E+02 | 27.31 | 6.12E+01 | 2.12 |
| m | 35 | 972.98 | 959 - | 980 | 972.67 | 2.11E+01 | 29.53 | 6.06E+01 | 2.69 |
| | 36 | 1045.73 | 1043 - | 1048 | 1045.34 | 1.36E+01 | 16.46 | 4.09E+01 | 1.88 |
| | 37 | 1121.16 | 1116 - | 1125 | 1120.70 | 7.29E+01 | 38.44 | 1.68E+02 | 1.56 |
| | 38 | 1214.85 | 1211 - | 1216 | 1214.30 | 1.58E+01 | 20.49 | 7.04E+01 | 1.02 |
| | 39 | 1237.50 | 1231 - | 1242 | 1236.92 | 4.09E+01 | 38.21 | 1.62E+02 | 4.15 |
| | 40 | 1377.44 | 1373 - | 1382 | 1376.73 | 1.74E+01 | 22.18 | 6.13E+01 | 1.93 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 41 | 1409.55 | 1404 - | 1415 | 1408.80 | 2.16E+01 | 22.80 | 5.49E+01 | 2.89 |
| | 42 | 1461.47 | 1456 - | 1467 | 1460.68 | 8.24E+02 | 61.22 | 6.48E+01 | 2.33 |
| M | 43 | 1589.45 | 1585 - | 1596 | 1588.53 | 1.61E+01 | 13.42 | 1.60E+01 | 2.69 |
| m | 44 | 1593.39 | 1585 - | 1596 | 1592.47 | 9.13E+00 | 13.42 | 1.60E+01 | 2.69 |
| | 45 | 1621.72 | 1616 - | 1625 | 1620.77 | 1.17E+01 | 12.12 | 1.27E+01 | 2.15 |
| | 46 | 1635.43 | 1627 - | 1641 | 1634.46 | 1.89E+01 | 16.99 | 2.22E+01 | 9.74 |
| | 47 | 1694.86 | 1689 - | 1698 | 1693.83 | 8.88E+00 | 11.79 | 1.43E+01 | 5.54 |
| M | 48 | 1730.28 | 1726 - | 1735 | 1729.23 | 1.38E+01 | 8.87 | 8.54E+00 | 2.49 |
| m | 49 | 1733.29 | 1726 - | 1735 | 1732.23 | 1.05E+01 | 10.99 | 9.13E+00 | 2.49 |
| | 50 | 1765.23 | 1759 - | 1769 | 1764.13 | 5.38E+01 | 23.37 | 4.43E+01 | 2.00 |
| | 51 | 1847.42 | 1842 - | 1850 | 1846.24 | 2.27E+01 | 10.97 | 4.68E+00 | 4.11 |
| | 52 | 1966.99 | 1960 - | 1969 | 1965.70 | 8.32E+00 | 8.31 | 5.36E+00 | 3.15 |
| | 53 | 2017.36 | 2011 - | 2019 | 2016.03 | 7.58E+00 | 9.41 | 8.83E+00 | 3.37 |
| | 54 | 2058.26 | 2052 - | 2059 | 2056.89 | 7.83E+00 | 8.94 | 8.33E+00 | 2.98 |
| | 55 | 2105.57 | 2100 - | 2108 | 2104.14 | 1.22E+01 | 13.61 | 1.76E+01 | 1.92 |
| M | 56 | 2204.62 | 2198 - | 2210 | 2203.11 | 2.88E+01 | 12.53 | 5.65E+00 | 3.50 |
| m | 57 | 2209.44 | 2198 - | 2210 | 2207.91 | 7.26E+00 | 7.00 | 4.59E-01 | 3.50 |
| | 58 | 2281.41 | 2276 - | 2283 | 2279.82 | 6.00E+00 | 6.93 | 4.00E+00 | 1.11 |
| | 59 | 2309.92 | 2304 - | 2311 | 2308.31 | 5.88E+00 | 6.93 | 4.25E+00 | 3.14 |
| | 60 | 2345.77 | 2338 - | 2351 | 2344.12 | 1.70E+01 | 8.25 | 0.00E+00 | 3.17 |
| | 61 | 2448.77 | 2442 - | 2450 | 2447.02 | 1.25E+01 | 10.42 | 9.06E+00 | 4.19 |
| | 62 | 2615.21 | 2609 - | 2617 | 2613.30 | 8.34E+01 | 19.81 | 9.30E+00 | 2.76 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 11:04:07AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 62.94 | 60 - | 66 | 2.01E+02 | 94.82 | 1.50E+03 | 3.26E+01 |
| M | 2 | 74.56 | 71 - | 81 | 2.84E+02 | 86.02 | 1.19E+03 | 5.68E+01 |
| m | 3 | 77.26 | 71 - | 81 | 4.81E+02 | 91.47 | 1.19E+03 | 5.66E+01 |
| M | 4 | 87.27 | 83 - | 96 | 1.31E+02 | 74.40 | 1.05E+03 | 5.32E+01 |
| m | 5 | 92.30 | 83 - | 96 | 3.07E+02 | 76.60 | 9.68E+02 | 5.12E+01 |
| | 6 | 104.70 | 103 - | 107 | 4.83E+01 | 57.18 | 6.91E+02 | 4.56E+01 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 7 | 185.94 | 183 - | 190 | 1.69E+02 | 76.47 | 8.57E+02 | 5.91E+01 |
| | 8 | 209.47 | 207 - | 213 | 7.57E+01 | 61.88 | 6.43E+02 | 4.88E+01 |
| M | 9 | 238.65 | 233 - | 248 | 7.29E+02 | 70.17 | 4.55E+02 | 3.51E+01 |
| m | 10 | 242.23 | 233 - | 248 | 1.83E+02 | 62.39 | 4.88E+02 | 3.63E+01 |
| | 11 | 269.97 | 267 - | 273 | 6.49E+01 | 50.82 | 4.20E+02 | 3.96E+01 |
| | 12 | 276.21 | 274 - | 280 | 6.54E+01 | 49.97 | 4.07E+02 | 3.89E+01 |
| M | 13 | 295.46 | 292 - | 304 | 2.63E+02 | 51.45 | 3.39E+02 | 3.03E+01 |
| m | 14 | 299.81 | 292 - | 304 | 4.78E+01 | 43.58 | 2.66E+02 | 2.68E+01 |
| | 15 | 327.49 | 324 - | 332 | 5.50E+01 | 53.05 | 3.96E+02 | 4.19E+01 |
| | 16 | 338.69 | 335 - | 342 | 1.44E+02 | 52.50 | 3.62E+02 | 3.84E+01 |
| M | 17 | 345.04 | 343 - | 366 | 4.32E+01 | 27.50 | 1.60E+02 | 2.08E+01 |
| m | 18 | 351.98 | 343 - | 366 | 4.66E+02 | 51.27 | 1.70E+02 | 2.14E+01 |
| m | 19 | 361.33 | 343 - | 366 | 2.15E+01 | 33.05 | 1.71E+02 | 2.15E+01 |
| | 20 | 463.47 | 460 - | 468 | 6.44E+01 | 43.57 | 2.53E+02 | 3.33E+01 |
| | 21 | 510.72 | 505 - | 516 | 2.04E+02 | 54.99 | 2.76E+02 | 3.86E+01 |
| | 22 | 569.06 | 567 - | 572 | 2.28E+01 | 25.98 | 1.16E+02 | 1.99E+01 |
| | 23 | 583.02 | 577 - | 587 | 2.52E+02 | 52.33 | 2.31E+02 | 3.42E+01 |
| | 24 | 609.36 | 605 - | 614 | 3.28E+02 | 56.33 | 2.69E+02 | 3.55E+01 |
| | 25 | 727.95 | 725 - | 731 | 3.63E+01 | 31.09 | 1.47E+02 | 2.36E+01 |
| | 26 | 770.01 | 765 - | 776 | 5.28E+01 | 39.40 | 1.66E+02 | 3.01E+01 |
| | 27 | 794.93 | 791 - | 799 | 3.71E+01 | 30.11 | 1.16E+02 | 8.62E+00 |
| | 28 | 826.74 | 819 - | 832 | 3.73E+01 | 39.17 | 1.53E+02 | 3.06E+01 |
| | 29 | 837.72 | 833 - | 841 | 4.93E+01 | 28.45 | 9.34E+01 | 2.03E+01 |
| | 30 | 860.90 | 857 - | 866 | 3.31E+01 | 30.58 | 1.14E+02 | 2.33E+01 |
| M | 31 | 895.24 | 894 - | 917 | 1.67E+01 | 9.80 | 2.03E+01 | 7.40E+00 |
| m | 32 | 911.45 | 894 - | 917 | 1.88E+02 | 33.53 | 7.37E+01 | 1.41E+01 |
| M | 33 | 964.76 | 959 - | 980 | 4.09E+01 | 25.01 | 9.52E+01 | 1.60E+01 |
| m | 34 | 969.25 | 959 - | 980 | 1.11E+02 | 27.31 | 6.12E+01 | 1.29E+01 |
| m | 35 | 972.98 | 959 - | 980 | 2.11E+01 | 29.53 | 6.06E+01 | 1.28E+01 |
| | 36 | 1045.73 | 1043 - | 1048 | 1.36E+01 | 16.46 | 4.09E+01 | 1.21E+01 |
| | 37 | 1121.16 | 1116 - | 1125 | 7.29E+01 | 38.44 | 1.68E+02 | 2.83E+01 |
| | 38 | 1214.85 | 1211 - | 1216 | 1.58E+01 | 20.49 | 7.04E+01 | 1.55E+01 |
| | 39 | 1237.50 | 1231 - | 1242 | 4.09E+01 | 38.21 | 1.62E+02 | 2.96E+01 |
| | 40 | 1377.44 | 1373 - | 1382 | 1.74E+01 | 22.18 | 6.13E+01 | 1.69E+01 |
| | 41 | 1409.55 | 1404 - | 1415 | 2.16E+01 | 22.80 | 5.49E+01 | 1.71E+01 |
| | 42 | 1461.47 | 1456 - | 1467 | 8.24E+02 | 61.22 | 6.48E+01 | 1.75E+01 |
| M | 43 | 1589.45 | 1585 - | 1596 | 1.61E+01 | 13.42 | 1.60E+01 | 6.58E+00 |
| m | 44 | 1593.39 | 1585 - | 1596 | 9.13E+00 | 13.42 | 1.60E+01 | 6.58E+00 |
| | 45 | 1621.72 | 1616 - | 1625 | 1.17E+01 | 12.12 | 1.27E+01 | 8.23E+00 |
| | 46 | 1635.43 | 1627 - | 1641 | 1.89E+01 | 16.99 | 2.22E+01 | 1.20E+01 |
| | 47 | 1694.86 | 1689 - | 1698 | 8.88E+00 | 11.79 | 1.43E+01 | 8.36E+00 |
| M | 48 | 1730.28 | 1726 - | 1735 | 1.38E+01 | 8.87 | 8.54E+00 | 4.80E+00 |
| m | 49 | 1733.29 | 1726 - | 1735 | 1.05E+01 | 10.99 | 9.13E+00 | 4.97E+00 |
| | 50 | 1765.23 | 1759 - | 1769 | 5.38E+01 | 23.37 | 4.43E+01 | 1.49E+01 |
| | 51 | 1847.42 | 1842 - | 1850 | 2.27E+01 | 10.97 | 4.68E+00 | 4.47E+00 |
| | 52 | 1966.99 | 1960 - | 1969 | 8.32E+00 | 8.31 | 5.36E+00 | 4.91E+00 |
| | 53 | 2017.36 | 2011 - | 2019 | 7.58E+00 | 9.41 | 8.83E+00 | 6.27E+00 |
| | 54 | 2058.26 | 2052 - | 2059 | 7.83E+00 | 8.94 | 8.33E+00 | 5.73E+00 |
| | 55 | 2105.57 | 2100 - | 2108 | 1.22E+01 | 13.61 | 1.76E+01 | 9.60E+00 |
| M | 56 | 2204.62 | 2198 - | 2210 | 2.88E+01 | 12.53 | 5.65E+00 | 3.91E+00 |
| m | 57 | 2209.44 | 2198 - | 2210 | 7.26E+00 | 7.00 | 4.59E-01 | 1.11E+00 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 58 | 2281.41 | 2276 - | 2283 | 6.00E+00 | 6.93 | 4.00E+00 | 4.03E+00 |
| 59 | 2309.92 | 2304 - | 2311 | 5.88E+00 | 6.93 | 4.25E+00 | 4.07E+00 |
| 60 | 2345.77 | 2338 - | 2351 | 1.70E+01 | 8.25 | 0.00E+00 | 0.00E+00 |
| 61 | 2448.77 | 2442 - | 2450 | 1.25E+01 | 10.42 | 9.06E+00 | 6.29E+00 |
| 62 | 2615.21 | 2609 - | 2617 | 8.34E+01 | 19.81 | 9.30E+00 | 6.32E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 11:04:07AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 62.94 | 60 - | 66 | 63.55 | 2.01E+02 | 94.82 | 1.50E+03 | TH-230 |
| | | | | | | | | | TH-234 |
| M | 2 | 74.56 | 71 - | 81 | 75.15 | 2.84E+02 | 86.02 | 1.19E+03 | AM-243 |
| m | 3 | 77.26 | 71 - | 81 | 77.85 | 4.81E+02 | 91.47 | 1.19E+03 | ..... |
| M | 4 | 87.27 | 83 - | 96 | 87.85 | 1.31E+02 | 74.40 | 1.05E+03 | SN-126 |
| | | | | | | | | | CD-109 |
| | | | | | | | | | NP-237 |
| | | | | | | | | | EU-155 |
| m | 5 | 92.30 | 83 - | 96 | 92.87 | 3.07E+02 | 76.60 | 9.68E+02 | ..... |
| | 6 | 104.70 | 103 - | 107 | 105.26 | 4.83E+01 | 57.18 | 6.91E+02 | EU-155 |
| | 7 | 185.94 | 183 - | 190 | 186.42 | 1.69E+02 | 76.47 | 8.57E+02 | RA-226 |
| | 8 | 209.47 | 207 - | 213 | 209.92 | 7.57E+01 | 61.88 | 6.43E+02 | CM-243 |
| | | | | | | | | | GA-67 |
| M | 9 | 238.65 | 233 - | 248 | 239.08 | 7.29E+02 | 70.17 | 4.55E+02 | PB-212 |
| m | 10 | 242.23 | 233 - | 248 | 242.65 | 1.83E+02 | 62.39 | 4.88E+02 | ..... |
| | 11 | 269.97 | 267 - | 273 | 270.37 | 6.49E+01 | 50.82 | 4.20E+02 | ..... |
| | 12 | 276.21 | 274 - | 280 | 276.60 | 6.54E+01 | 49.97 | 4.07E+02 | ..... |
| M | 13 | 295.46 | 292 - | 304 | 295.83 | 2.63E+02 | 51.45 | 3.39E+02 | PB-214 |
| m | 14 | 299.81 | 292 - | 304 | 300.17 | 4.78E+01 | 43.58 | 2.66E+02 | BI-210M |
| | | | | | | | | | PB-212 |
| | | | | | | | | | GA-67 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 15 | 327.49 | 324 - | 332 | 327.82 | 5.50E+01 | 53.05 | 3.96E+02 | ..... |
| | 16 | 338.69 | 335 - | 342 | 339.01 | 1.44E+02 | 52.50 | 3.62E+02 | AC-228 |
| M | 17 | 345.04 | 343 - | 366 | 345.36 | 4.32E+01 | 27.50 | 1.60E+02 | EU-152 |
| | | | | | | | | | HF-181 |
| m | 18 | 351.98 | 343 - | 366 | 352.29 | 4.66E+02 | 51.27 | 1.70E+02 | PB-214 |
| m | 19 | 361.33 | 343 - | 366 | 361.64 | 2.15E+01 | 33.05 | 1.71E+02 | ..... |
| | 20 | 463.47 | 460 - | 468 | 463.67 | 6.44E+01 | 43.57 | 2.53E+02 | SB-125 |
| | 21 | 510.72 | 505 - | 516 | 510.87 | 2.04E+02 | 54.99 | 2.76E+02 | ..... |
| | 22 | 569.06 | 567 - | 572 | 569.15 | 2.28E+01 | 25.98 | 1.16E+02 | CS-134 |
| | | | | | | | | | BI-207 |
| | 23 | 583.02 | 577 - | 587 | 583.10 | 2.52E+02 | 52.33 | 2.31E+02 | TL-208 |
| | 24 | 609.36 | 605 - | 614 | 609.41 | 3.28E+02 | 56.33 | 2.69E+02 | BI-214 |
| | 25 | 727.95 | 725 - | 731 | 727.88 | 3.63E+01 | 31.09 | 1.47E+02 | BI-212 |
| | 26 | 770.01 | 765 - | 776 | 769.90 | 5.28E+01 | 39.40 | 1.66E+02 | ..... |
| | 27 | 794.93 | 791 - | 799 | 794.79 | 3.71E+01 | 30.11 | 1.16E+02 | CS-134 |
| | 28 | 826.74 | 819 - | 832 | 826.57 | 3.73E+01 | 39.17 | 1.53E+02 | ..... |
| | 29 | 837.72 | 833 - | 841 | 837.54 | 4.93E+01 | 28.45 | 9.34E+01 | ..... |
| | 30 | 860.90 | 857 - | 866 | 860.70 | 3.31E+01 | 30.58 | 1.14E+02 | TL-208 |
| M | 31 | 895.24 | 894 - | 917 | 895.00 | 1.67E+01 | 9.80 | 2.03E+01 | ..... |
| m | 32 | 911.45 | 894 - | 917 | 911.20 | 1.88E+02 | 33.53 | 7.37E+01 | TL-204 |
| | | | | | | | | | AC-228 |
| M | 33 | 964.76 | 959 - | 980 | 964.45 | 4.09E+01 | 25.01 | 9.52E+01 | EU-152 |
| m | 34 | 969.25 | 959 - | 980 | 968.94 | 1.11E+02 | 27.31 | 6.12E+01 | AC-228 |
| m | 35 | 972.98 | 959 - | 980 | 972.67 | 2.11E+01 | 29.53 | 6.06E+01 | ..... |
| | 36 | 1045.73 | 1043 - | 1048 | 1045.34 | 1.36E+01 | 16.46 | 4.09E+01 | ..... |
| | 37 | 1121.16 | 1116 - | 1125 | 1120.70 | 7.29E+01 | 38.44 | 1.68E+02 | TA-182 |
| | | | | | | | | | SC-46 |
| | | | | | | | | | BI-214 |
| | 38 | 1214.85 | 1211 - | 1216 | 1214.30 | 1.58E+01 | 20.49 | 7.04E+01 | ..... |
| | 39 | 1237.50 | 1231 - | 1242 | 1236.92 | 4.09E+01 | 38.21 | 1.62E+02 | CO-56 |
| | 40 | 1377.44 | 1373 - | 1382 | 1376.73 | 1.74E+01 | 22.18 | 6.13E+01 | ..... |
| | 41 | 1409.55 | 1404 - | 1415 | 1408.80 | 2.16E+01 | 22.80 | 5.49E+01 | ..... |
| | 42 | 1461.47 | 1456 - | 1467 | 1460.68 | 8.24E+02 | 61.22 | 6.48E+01 | K-40 |
| M | 43 | 1589.45 | 1585 - | 1596 | 1588.53 | 1.61E+01 | 13.42 | 1.60E+01 | ..... |
| m | 44 | 1593.39 | 1585 - | 1596 | 1592.47 | 9.13E+00 | 13.42 | 1.60E+01 | ..... |
| | 45 | 1621.72 | 1616 - | 1625 | 1620.77 | 1.17E+01 | 12.12 | 1.27E+01 | ..... |
| | 46 | 1635.43 | 1627 - | 1641 | 1634.46 | 1.89E+01 | 16.99 | 2.22E+01 | ..... |
| | 47 | 1694.86 | 1689 - | 1698 | 1693.83 | 8.88E+00 | 11.79 | 1.43E+01 | ..... |
| M | 48 | 1730.28 | 1726 - | 1735 | 1729.23 | 1.38E+01 | 8.87 | 8.54E+00 | ..... |
| m | 49 | 1733.29 | 1726 - | 1735 | 1732.23 | 1.05E+01 | 10.99 | 9.13E+00 | ..... |
| | 50 | 1765.23 | 1759 - | 1769 | 1764.13 | 5.38E+01 | 23.37 | 4.43E+01 | BI-214 |
| | 51 | 1847.42 | 1842 - | 1850 | 1846.24 | 2.27E+01 | 10.97 | 4.68E+00 | ..... |
| | 52 | 1966.99 | 1960 - | 1969 | 1965.70 | 8.32E+00 | 8.31 | 5.36E+00 | ..... |
| | 53 | 2017.36 | 2011 - | 2019 | 2016.03 | 7.58E+00 | 9.41 | 8.83E+00 | ..... |
| | 54 | 2058.26 | 2052 - | 2059 | 2056.89 | 7.83E+00 | 8.94 | 8.33E+00 | ..... |
| | 55 | 2105.57 | 2100 - | 2108 | 2104.14 | 1.22E+01 | 13.61 | 1.76E+01 | ..... |
| M | 56 | 2204.62 | 2198 - | 2210 | 2203.11 | 2.88E+01 | 12.53 | 5.65E+00 | BI-214 |
| m | 57 | 2209.44 | 2198 - | 2210 | 2207.91 | 7.26E+00 | 7.00 | 4.59E-01 | ..... |
| | 58 | 2281.41 | 2276 - | 2283 | 2279.82 | 6.00E+00 | 6.93 | 4.00E+00 | ..... |
| | 59 | 2309.92 | 2304 - | 2311 | 2308.31 | 5.88E+00 | 6.93 | 4.25E+00 | ..... |
| | 60 | 2345.77 | 2338 - | 2351 | 2344.12 | 1.70E+01 | 8.25 | 0.00E+00 | ..... |
| | 61 | 2448.77 | 2442 - | 2450 | 2447.02 | 1.25E+01 | 10.42 | 9.06E+00 | ..... |
| | 62 | 2615.21 | 2609 - | 2617 | 2613.30 | 8.34E+01 | 19.81 | 9.30E+00 | TL-208 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 11:04:07AM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 62.94 | 2.01E+02 | 94.82 | 2.70E-02 | 2.25E-03 |
| M | 2 | 74.56 | 2.84E+02 | 86.02 | 2.75E-02 | 2.38E-03 |
| m | 3 | 77.26 | 4.81E+02 | 91.47 | 2.75E-02 | 2.41E-03 |
| M | 4 | 87.27 | 1.31E+02 | 74.40 | 2.74E-02 | 2.51E-03 |
| m | 5 | 92.30 | 3.07E+02 | 76.60 | 2.73E-02 | 2.45E-03 |
| | 6 | 104.70 | 4.83E+01 | 57.18 | 2.68E-02 | 2.25E-03 |
| | 7 | 185.94 | 1.69E+02 | 76.47 | 2.17E-02 | 1.68E-03 |
| | 8 | 209.47 | 7.57E+01 | 61.88 | 2.04E-02 | 1.61E-03 |
| M | 9 | 238.65 | 7.29E+02 | 70.17 | 1.89E-02 | 1.53E-03 |
| m | 10 | 242.23 | 1.83E+02 | 62.39 | 1.87E-02 | 1.52E-03 |
| | 11 | 269.97 | 6.49E+01 | 50.82 | 1.74E-02 | 1.44E-03 |
| | 12 | 276.21 | 6.54E+01 | 49.97 | 1.72E-02 | 1.42E-03 |
| M | 13 | 295.46 | 2.63E+02 | 51.45 | 1.64E-02 | 1.37E-03 |
| m | 14 | 299.81 | 4.78E+01 | 43.58 | 1.63E-02 | 1.36E-03 |
| | 15 | 327.49 | 5.50E+01 | 53.05 | 1.53E-02 | 1.30E-03 |
| | 16 | 338.69 | 1.44E+02 | 52.50 | 1.49E-02 | 1.27E-03 |
| M | 17 | 345.04 | 4.32E+01 | 27.50 | 1.47E-02 | 1.25E-03 |
| m | 18 | 351.98 | 4.66E+02 | 51.27 | 1.45E-02 | 1.24E-03 |
| m | 19 | 361.33 | 2.15E+01 | 33.05 | 1.43E-02 | 1.22E-03 |
| | 20 | 463.47 | 6.44E+01 | 43.57 | 1.19E-02 | 1.10E-03 |
| | 21 | 510.72 | 2.04E+02 | 54.99 | 1.10E-02 | 1.07E-03 |
| | 22 | 569.06 | 2.28E+01 | 25.98 | 1.02E-02 | 1.03E-03 |
| | 23 | 583.02 | 2.52E+02 | 52.33 | 9.97E-03 | 1.02E-03 |
| | 24 | 609.36 | 3.28E+02 | 56.33 | 9.63E-03 | 1.01E-03 |
| | 25 | 727.95 | 3.63E+01 | 31.09 | 8.40E-03 | 8.67E-04 |
| | 26 | 770.01 | 5.28E+01 | 39.40 | 8.05E-03 | 8.00E-04 |
| | 27 | 794.93 | 3.71E+01 | 30.11 | 7.86E-03 | 7.60E-04 |
| | 28 | 826.74 | 3.73E+01 | 39.17 | 7.63E-03 | 7.10E-04 |
| | 29 | 837.72 | 4.93E+01 | 28.45 | 7.55E-03 | 6.92E-04 |
| | 30 | 860.90 | 3.31E+01 | 30.58 | 7.40E-03 | 6.55E-04 |
| M | 31 | 895.24 | 1.67E+01 | 9.80 | 7.18E-03 | 6.01E-04 |
| m | 32 | 911.45 | 1.88E+02 | 33.53 | 7.08E-03 | 5.91E-04 |
| M | 33 | 964.76 | 4.09E+01 | 25.01 | 6.79E-03 | 5.71E-04 |
| m | 34 | 969.25 | 1.11E+02 | 27.31 | 6.76E-03 | 5.69E-04 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| m | 35 | 972.98 | 2.11E+01 | 29.53 | 6.74E-03 | 5.68E-04 |
| | 36 | 1045.73 | 1.36E+01 | 16.46 | 6.39E-03 | 5.40E-04 |
| | 37 | 1121.16 | 7.29E+01 | 38.44 | 6.07E-03 | 5.11E-04 |
| | 38 | 1214.85 | 1.58E+01 | 20.49 | 5.72E-03 | 4.81E-04 |
| | 39 | 1237.50 | 4.09E+01 | 38.21 | 5.65E-03 | 4.76E-04 |
| | 40 | 1377.44 | 1.74E+01 | 22.18 | 5.22E-03 | 4.44E-04 |
| | 41 | 1409.55 | 2.16E+01 | 22.80 | 5.14E-03 | 4.37E-04 |
| | 42 | 1461.47 | 8.24E+02 | 61.22 | 5.00E-03 | 4.25E-04 |
| M | 43 | 1589.45 | 1.61E+01 | 13.42 | 4.71E-03 | 3.95E-04 |
| m | 44 | 1593.39 | 9.13E+00 | 13.42 | 4.70E-03 | 3.94E-04 |
| | 45 | 1621.72 | 1.17E+01 | 12.12 | 4.65E-03 | 3.87E-04 |
| | 46 | 1635.43 | 1.89E+01 | 16.99 | 4.62E-03 | 3.84E-04 |
| | 47 | 1694.86 | 8.88E+00 | 11.79 | 4.50E-03 | 3.71E-04 |
| M | 48 | 1730.28 | 1.38E+01 | 8.87 | 4.44E-03 | 3.62E-04 |
| m | 49 | 1733.29 | 1.05E+01 | 10.99 | 4.43E-03 | 3.62E-04 |
| | 50 | 1765.23 | 5.38E+01 | 23.37 | 4.37E-03 | 3.54E-04 |
| | 51 | 1847.42 | 2.27E+01 | 10.97 | 4.23E-03 | 3.38E-04 |
| | 52 | 1966.99 | 8.32E+00 | 8.31 | 4.05E-03 | 3.38E-04 |
| | 53 | 2017.36 | 7.58E+00 | 9.41 | 3.98E-03 | 3.38E-04 |
| | 54 | 2058.26 | 7.83E+00 | 8.94 | 3.92E-03 | 3.38E-04 |
| | 55 | 2105.57 | 1.22E+01 | 13.61 | 3.86E-03 | 3.38E-04 |
| M | 56 | 2204.62 | 2.88E+01 | 12.53 | 3.74E-03 | 3.38E-04 |
| m | 57 | 2209.44 | 7.26E+00 | 7.00 | 3.73E-03 | 3.38E-04 |
| | 58 | 2281.41 | 6.00E+00 | 6.93 | 3.65E-03 | 3.38E-04 |
| | 59 | 2309.92 | 5.88E+00 | 6.93 | 3.61E-03 | 3.38E-04 |
| | 60 | 2345.77 | 1.70E+01 | 8.25 | 3.57E-03 | 3.38E-04 |
| | 61 | 2448.77 | 1.25E+01 | 10.42 | 3.47E-03 | 3.38E-04 |
| | 62 | 2615.21 | 8.34E+01 | 19.81 | 3.31E-03 | 3.38E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 11:04:07AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 62.94 | 2.01E+02 | 94.82 | 8.94E+01 | 1.41E+01 | 1.11E+02 | 9.59E+01 |
| M | 2 | 74.56 | 2.84E+02 | 86.02 | | | 2.84E+02 | 8.60E+01 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| m | 3 | 77.26 | 4.81E+02 | 91.47 | 7.20E+00 | 1.47E+00 | 4.73E+02 | 9.15E+01 |
| M | 4 | 87.27 | 1.31E+02 | 74.40 | | | 1.31E+02 | 7.44E+01 |
| m | 5 | 92.30 | 3.07E+02 | 76.60 | 1.38E+02 | 1.72E+01 | 1.69E+02 | 7.85E+01 |
| | 6 | 104.70 | 4.83E+01 | 57.18 | | | 4.83E+01 | 5.72E+01 |
| | 7 | 185.94 | 1.69E+02 | 76.47 | 5.22E+01 | 7.59E+00 | 1.17E+02 | 7.68E+01 |
| | 8 | 209.47 | 7.57E+01 | 61.88 | | | 7.57E+01 | 6.19E+01 |
| M | 9 | 238.65 | 7.29E+02 | 70.17 | 2.13E+01 | 6.33E+00 | 7.08E+02 | 7.05E+01 |
| m | 10 | 242.23 | 1.83E+02 | 62.39 | | | 1.83E+02 | 6.24E+01 |
| | 11 | 269.97 | 6.49E+01 | 50.82 | 1.23E+00 | 4.98E+00 | 6.36E+01 | 5.11E+01 |
| | 12 | 276.21 | 6.54E+01 | 49.97 | | | 6.54E+01 | 5.00E+01 |
| M | 13 | 295.46 | 2.63E+02 | 51.45 | | | 2.63E+02 | 5.14E+01 |
| m | 14 | 299.81 | 4.78E+01 | 43.58 | | | 4.78E+01 | 4.36E+01 |
| | 15 | 327.49 | 5.50E+01 | 53.05 | | | 5.50E+01 | 5.30E+01 |
| | 16 | 338.69 | 1.44E+02 | 52.50 | | | 1.44E+02 | 5.25E+01 |
| M | 17 | 345.04 | 4.32E+01 | 27.50 | | | 4.32E+01 | 2.75E+01 |
| m | 18 | 351.98 | 4.66E+02 | 51.27 | 5.79E+00 | 4.49E+00 | 4.60E+02 | 5.15E+01 |
| m | 19 | 361.33 | 2.15E+01 | 33.05 | | | 2.15E+01 | 3.30E+01 |
| | 20 | 463.47 | 6.44E+01 | 43.57 | | | 6.44E+01 | 4.36E+01 |
| | 21 | 510.72 | 2.04E+02 | 54.99 | 7.28E+01 | 5.30E+00 | 1.31E+02 | 5.52E+01 |
| | 22 | 569.06 | 2.28E+01 | 25.98 | 0.00E+00 | 0.00E+00 | 2.28E+01 | 2.60E+01 |
| | 23 | 583.02 | 2.52E+02 | 52.33 | 2.72E+00 | 3.05E+00 | 2.49E+02 | 5.24E+01 |
| | 24 | 609.36 | 3.28E+02 | 56.33 | 6.35E+00 | 4.02E+00 | 3.21E+02 | 5.65E+01 |
| | 25 | 727.95 | 3.63E+01 | 31.09 | | | 3.63E+01 | 3.11E+01 |
| | 26 | 770.01 | 5.28E+01 | 39.40 | | | 5.28E+01 | 3.94E+01 |
| | 27 | 794.93 | 3.71E+01 | 30.11 | | | 3.71E+01 | 3.01E+01 |
| | 28 | 826.74 | 3.73E+01 | 39.17 | | | 3.73E+01 | 3.92E+01 |
| | 29 | 837.72 | 4.93E+01 | 28.45 | | | 4.93E+01 | 2.84E+01 |
| | 30 | 860.90 | 3.31E+01 | 30.58 | | | 3.31E+01 | 3.06E+01 |
| M | 31 | 895.24 | 1.67E+01 | 9.80 | | | 1.67E+01 | 9.80E+00 |
| m | 32 | 911.45 | 1.88E+02 | 33.53 | 5.31E+00 | 3.00E+00 | 1.82E+02 | 3.37E+01 |
| M | 33 | 964.76 | 4.09E+01 | 25.01 | | | 4.09E+01 | 2.50E+01 |
| m | 34 | 969.25 | 1.11E+02 | 27.31 | | | 1.11E+02 | 2.73E+01 |
| m | 35 | 972.98 | 2.11E+01 | 29.53 | | | 2.11E+01 | 2.95E+01 |
| | 36 | 1045.73 | 1.36E+01 | 16.46 | | | 1.36E+01 | 1.65E+01 |
| | 37 | 1121.16 | 7.29E+01 | 38.44 | | | 7.29E+01 | 3.84E+01 |
| | 38 | 1214.85 | 1.58E+01 | 20.49 | | | 1.58E+01 | 2.05E+01 |
| | 39 | 1237.50 | 4.09E+01 | 38.21 | | | 4.09E+01 | 3.82E+01 |
| | 40 | 1377.44 | 1.74E+01 | 22.18 | | | 1.74E+01 | 2.22E+01 |
| | 41 | 1409.55 | 2.16E+01 | 22.80 | | | 2.16E+01 | 2.28E+01 |
| | 42 | 1461.47 | 8.24E+02 | 61.22 | 8.09E+00 | 2.23E+00 | 8.15E+02 | 6.13E+01 |
| M | 43 | 1589.45 | 1.61E+01 | 13.42 | | | 1.61E+01 | 1.34E+01 |
| m | 44 | 1593.39 | 9.13E+00 | 13.42 | | | 9.13E+00 | 1.34E+01 |
| | 45 | 1621.72 | 1.17E+01 | 12.12 | | | 1.17E+01 | 1.21E+01 |
| | 46 | 1635.43 | 1.89E+01 | 16.99 | | | 1.89E+01 | 1.70E+01 |
| | 47 | 1694.86 | 8.88E+00 | 11.79 | | | 8.88E+00 | 1.18E+01 |
| M | 48 | 1730.28 | 1.38E+01 | 8.87 | | | 1.38E+01 | 8.87E+00 |
| m | 49 | 1733.29 | 1.05E+01 | 10.99 | | | 1.05E+01 | 1.10E+01 |
| | 50 | 1765.23 | 5.38E+01 | 23.37 | | | 5.38E+01 | 2.34E+01 |
| | 51 | 1847.42 | 2.27E+01 | 10.97 | 1.22E+00 | 1.50E+00 | 2.14E+01 | 1.11E+01 |
| | 52 | 1966.99 | 8.32E+00 | 8.31 | | | 8.32E+00 | 8.31E+00 |
| | 53 | 2017.36 | 7.58E+00 | 9.41 | | | 7.58E+00 | 9.41E+00 |
| | 54 | 2058.26 | 7.83E+00 | 8.94 | | | 7.83E+00 | 8.94E+00 |
| | 55 | 2105.57 | 1.22E+01 | 13.61 | | | 1.22E+01 | 1.36E+01 |
| M | 56 | 2204.62 | 2.88E+01 | 12.53 | | | 2.88E+01 | 1.25E+01 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| m | 57 | 2209.44 | 7.26E+00 | 7.00 | | | 7.26E+00 | 7.00E+00 |
| | 58 | 2281.41 | 6.00E+00 | 6.93 | | | 6.00E+00 | 6.93E+00 |
| | 59 | 2309.92 | 5.88E+00 | 6.93 | | | 5.88E+00 | 6.93E+00 |
| | 60 | 2345.77 | 1.70E+01 | 8.25 | | | 1.70E+01 | 8.25E+00 |
| | 61 | 2448.77 | 1.25E+01 | 10.42 | | | 1.25E+01 | 1.04E+01 |
| | 62 | 2615.21 | 8.34E+01 | 19.81 | 5.63E+00 | 1.38E+00 | 7.77E+01 | 1.99E+01 |

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 11:04:07AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 62.94 | 2.01E+02 | 94.82 | 8.94E+01 | 1.41E+01 | 1.11E+02 | 9.59E+01 |
| M | 2 | 74.56 | 2.84E+02 | 86.02 | | | 2.84E+02 | 8.60E+01 |
| m | 3 | 77.26 | 4.81E+02 | 91.47 | 7.20E+00 | 1.47E+00 | 4.73E+02 | 9.15E+01 |
| M | 4 | 87.27 | 1.31E+02 | 74.40 | | | 1.31E+02 | 7.44E+01 |
| m | 5 | 92.30 | 3.07E+02 | 76.60 | 1.38E+02 | 1.72E+01 | 1.69E+02 | 7.85E+01 |
| | 6 | 104.70 | 4.83E+01 | 57.18 | | | 4.83E+01 | 5.72E+01 |
| | 7 | 185.94 | 1.69E+02 | 76.47 | 5.22E+01 | 7.59E+00 | 1.17E+02 | 7.68E+01 |
| | 8 | 209.47 | 7.57E+01 | 61.88 | | | 7.57E+01 | 6.19E+01 |
| M | 9 | 238.65 | 7.29E+02 | 70.17 | 2.13E+01 | 6.33E+00 | 7.08E+02 | 7.05E+01 |
| m | 10 | 242.23 | 1.83E+02 | 62.39 | | | 1.83E+02 | 6.24E+01 |
| | 11 | 269.97 | 6.49E+01 | 50.82 | 1.23E+00 | 4.98E+00 | 6.36E+01 | 5.11E+01 |
| | 12 | 276.21 | 6.54E+01 | 49.97 | | | 6.54E+01 | 5.00E+01 |
| M | 13 | 295.46 | 2.63E+02 | 51.45 | | | 2.63E+02 | 5.14E+01 |
| m | 14 | 299.81 | 4.78E+01 | 43.58 | | | 4.78E+01 | 4.36E+01 |
| | 15 | 327.49 | 5.50E+01 | 53.05 | | | 5.50E+01 | 5.30E+01 |
| | 16 | 338.69 | 1.44E+02 | 52.50 | | | 1.44E+02 | 5.25E+01 |
| M | 17 | 345.04 | 4.32E+01 | 27.50 | | | 4.32E+01 | 2.75E+01 |
| m | 18 | 351.98 | 4.66E+02 | 51.27 | 5.79E+00 | 4.49E+00 | 4.60E+02 | 5.15E+01 |
| m | 19 | 361.33 | 2.15E+01 | 33.05 | | | 2.15E+01 | 3.30E+01 |
| | 20 | 463.47 | 6.44E+01 | 43.57 | | | 6.44E+01 | 4.36E+01 |
| | 21 | 510.72 | 2.04E+02 | 54.99 | 7.28E+01 | 5.30E+00 | 1.31E+02 | 5.52E+01 |
| | 22 | 569.06 | 2.28E+01 | 25.98 | 0.00E+00 | 0.00E+00 | 2.28E+01 | 2.60E+01 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 23 | 583.02 | 2.52E+02 | 52.33 | 2.72E+00 | 3.05E+00 | 2.49E+02 | 5.24E+01 |
| | 24 | 609.36 | 3.28E+02 | 56.33 | 6.35E+00 | 4.02E+00 | 3.21E+02 | 5.65E+01 |
| | 25 | 727.95 | 3.63E+01 | 31.09 | | | 3.63E+01 | 3.11E+01 |
| | 26 | 770.01 | 5.28E+01 | 39.40 | | | 5.28E+01 | 3.94E+01 |
| | 27 | 794.93 | 3.71E+01 | 30.11 | | | 3.71E+01 | 3.01E+01 |
| | 28 | 826.74 | 3.73E+01 | 39.17 | | | 3.73E+01 | 3.92E+01 |
| | 29 | 837.72 | 4.93E+01 | 28.45 | | | 4.93E+01 | 2.84E+01 |
| | 30 | 860.90 | 3.31E+01 | 30.58 | | | 3.31E+01 | 3.06E+01 |
| M | 31 | 895.24 | 1.67E+01 | 9.80 | | | 1.67E+01 | 9.80E+00 |
| m | 32 | 911.45 | 1.88E+02 | 33.53 | 5.31E+00 | 3.00E+00 | 1.82E+02 | 3.37E+01 |
| M | 33 | 964.76 | 4.09E+01 | 25.01 | | | 4.09E+01 | 2.50E+01 |
| m | 34 | 969.25 | 1.11E+02 | 27.31 | | | 1.11E+02 | 2.73E+01 |
| m | 35 | 972.98 | 2.11E+01 | 29.53 | | | 2.11E+01 | 2.95E+01 |
| | 36 | 1045.73 | 1.36E+01 | 16.46 | | | 1.36E+01 | 1.65E+01 |
| | 37 | 1121.16 | 7.29E+01 | 38.44 | | | 7.29E+01 | 3.84E+01 |
| | 38 | 1214.85 | 1.58E+01 | 20.49 | | | 1.58E+01 | 2.05E+01 |
| | 39 | 1237.50 | 4.09E+01 | 38.21 | | | 4.09E+01 | 3.82E+01 |
| | 40 | 1377.44 | 1.74E+01 | 22.18 | | | 1.74E+01 | 2.22E+01 |
| | 41 | 1409.55 | 2.16E+01 | 22.80 | | | 2.16E+01 | 2.28E+01 |
| | 42 | 1461.47 | 8.24E+02 | 61.22 | 8.09E+00 | 2.23E+00 | 8.15E+02 | 6.13E+01 |
| M | 43 | 1589.45 | 1.61E+01 | 13.42 | | | 1.61E+01 | 1.34E+01 |
| m | 44 | 1593.39 | 9.13E+00 | 13.42 | | | 9.13E+00 | 1.34E+01 |
| | 45 | 1621.72 | 1.17E+01 | 12.12 | | | 1.17E+01 | 1.21E+01 |
| | 46 | 1635.43 | 1.89E+01 | 16.99 | | | 1.89E+01 | 1.70E+01 |
| | 47 | 1694.86 | 8.88E+00 | 11.79 | | | 8.88E+00 | 1.18E+01 |
| M | 48 | 1730.28 | 1.38E+01 | 8.87 | | | 1.38E+01 | 8.87E+00 |
| m | 49 | 1733.29 | 1.05E+01 | 10.99 | | | 1.05E+01 | 1.10E+01 |
| | 50 | 1765.23 | 5.38E+01 | 23.37 | | | 5.38E+01 | 2.34E+01 |
| | 51 | 1847.42 | 2.27E+01 | 10.97 | 1.22E+00 | 1.50E+00 | 2.14E+01 | 1.11E+01 |
| | 52 | 1966.99 | 8.32E+00 | 8.31 | | | 8.32E+00 | 8.31E+00 |
| | 53 | 2017.36 | 7.58E+00 | 9.41 | | | 7.58E+00 | 9.41E+00 |
| | 54 | 2058.26 | 7.83E+00 | 8.94 | | | 7.83E+00 | 8.94E+00 |
| | 55 | 2105.57 | 1.22E+01 | 13.61 | | | 1.22E+01 | 1.36E+01 |
| M | 56 | 2204.62 | 2.88E+01 | 12.53 | | | 2.88E+01 | 1.25E+01 |
| m | 57 | 2209.44 | 7.26E+00 | 7.00 | | | 7.26E+00 | 7.00E+00 |
| | 58 | 2281.41 | 6.00E+00 | 6.93 | | | 6.00E+00 | 6.93E+00 |
| | 59 | 2309.92 | 5.88E+00 | 6.93 | | | 5.88E+00 | 6.93E+00 |
| | 60 | 2345.77 | 1.70E+01 | 8.25 | | | 1.70E+01 | 8.25E+00 |
| | 61 | 2448.77 | 1.25E+01 | 10.42 | | | 1.25E+01 | 1.04E+01 |
| | 62 | 2615.21 | 8.34E+01 | 19.81 | 5.63E+00 | 1.38E+00 | 7.77E+01 | 1.99E+01 |

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

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.932 | 1460.81 | * | 10.67 | 1.65E+01 | 1.90E+00 |
| EU-155 | 0.923 | 86.50 | * | 30.90 | 1.74E-01 | 9.97E-02 |
| | | 105.30 | * | 20.70 | 9.77E-02 | 1.16E-01 |
| BI-207 | 0.364 | 569.67 | * | 97.72 | 2.49E-02 | 2.85E-02 |
| | | 1063.62 | | 74.90 | | |
| TL-208 | 0.972 | 583.14 | * | 30.22 | 8.91E-01 | 2.09E-01 |
| | | 860.37 | * | 4.48 | 1.08E+00 | 1.00E+00 |
| | | 2614.66 | * | 35.85 | 7.08E-01 | 1.95E-01 |
| BI-212 | 0.688 | 727.17 | * | 11.80 | 3.95E-01 | 3.41E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.999 | 238.63 | * | 44.60 | 9.08E-01 | 1.16E-01 |
| | | 300.09 | * | 3.41 | 9.29E-01 | 8.51E-01 |
| BI-214 | 0.960 | 609.31 | * | 46.30 | 7.77E-01 | 1.59E-01 |
| | | 1120.29 | * | 15.10 | 8.58E-01 | 4.58E-01 |
| | | 1764.49 | * | 15.80 | 8.41E-01 | 3.71E-01 |
| | | 2204.22 | * | 4.98 | 1.67E+00 | 7.42E-01 |
| PB-214 | 0.996 | 295.21 | * | 19.19 | 8.99E-01 | 1.91E-01 |
| | | 351.92 | * | 37.19 | 9.17E-01 | 1.29E-01 |
| RA-226 | 0.989 | 186.21 | * | 3.28 | 1.77E+00 | 3.45E+00 |
| AC-228 | 0.983 | 338.32 | * | 11.40 | 9.13E-01 | 3.41E-01 |
| | | 911.07 | * | 27.70 | 1.00E+00 | 2.03E-01 |
| | | 969.11 | * | 16.60 | 1.07E+00 | 2.77E-01 |
| TH-234 | 0.981 | 63.29 | * | 3.80 | 1.17E+00 | 1.01E+00 |
| AM-243 | 0.998 | 74.67 | * | 66.00 | 1.69E-01 | 5.32E-02 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 11:04:07AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| m | 3 | 77.26 | 1.31495E-01 | 9.66 | | |
| m | 5 | 92.30 | 4.69419E-02 | 23.23 | | |
| | 8 | 209.47 | 2.10334E-02 | 40.86 | Sum | |
| m | 10 | 242.23 | 5.08112E-02 | 17.05 | | |
| | 11 | 269.97 | 1.76740E-02 | 40.12 | | |
| | 12 | 276.21 | 1.81717E-02 | 38.19 | | |
| | 15 | 327.49 | 1.52811E-02 | 48.22 | | |
| M | 17 | 345.04 | 1.19980E-02 | 31.83 | Tol. | EU-152<br>HF-181 |
| m | 19 | 361.33 | 5.97979E-03 | 76.75 | | |
| | 20 | 463.47 | 1.78963E-02 | 33.81 | | |
| | 21 | 510.72 | 3.64563E-02 | 21.05 | | |
| | 26 | 770.01 | 1.46793E-02 | 37.27 | | |
| | 27 | 794.93 | 1.03129E-02 | 40.55 | Sum | |
| | 28 | 826.74 | 1.03533E-02 | 52.54 | | |
| | 29 | 837.72 | 1.36936E-02 | 28.85 | | |
| M | 31 | 895.24 | 4.62895E-03 | 29.40 | | |
| M | 33 | 964.76 | 1.13552E-02 | 30.59 | Sum | |
| m | 35 | 972.98 | 5.85045E-03 | 70.10 | | |
| | 36 | 1045.73 | 3.76634E-03 | 60.71 | | |
| | 38 | 1214.85 | 4.39542E-03 | 64.76 | | |
| | 39 | 1237.50 | 1.13638E-02 | 46.70 | Tol. | CO-56 |
| | 40 | 1377.44 | 4.82639E-03 | 63.83 | | |
| | 41 | 1409.55 | 5.98639E-03 | 52.91 | | |
| M | 43 | 1589.45 | 4.47190E-03 | 41.67 | Sum | |
| m | 44 | 1593.39 | 2.53702E-03 | 73.45 | D-Esc | |
| | 45 | 1621.72 | 3.24074E-03 | 51.96 | | |
| | 46 | 1635.43 | 5.25000E-03 | 44.95 | | |
| | 47 | 1694.86 | 2.46528E-03 | 66.42 | | |
| M | 48 | 1730.28 | 3.82529E-03 | 32.22 | Sum | |
| m | 49 | 1733.29 | 2.91426E-03 | 52.37 | | |
| | 51 | 1847.42 | 5.95433E-03 | 25.82 | | |
| | 52 | 1966.99 | 2.31061E-03 | 49.93 | | |
| | 53 | 2017.36 | 2.10648E-03 | 62.03 | | |
| | 54 | 2058.26 | 2.17593E-03 | 57.09 | | |
| | 55 | 2105.57 | 3.38624E-03 | 55.82 | | |
| m | 57 | 2209.44 | 2.01672E-03 | 48.21 | | |
| | 58 | 2281.41 | 1.66667E-03 | 57.74 | | |
| | 59 | 2309.92 | 1.63194E-03 | 58.96 | Sum | |
| | 60 | 2345.77 | 4.72222E-03 | 24.25 | | |
| | 61 | 2448.77 | 3.46405E-03 | 41.76 | | |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.93 | 1460.81 | * | 10.67 | 1.65E+01 | 1.90E+00 |
| EU-155 | 0.92 | 86.50 | * | 30.90 | 1.74E-01 | 9.97E-02 |
| | | 105.30 | * | 20.70 | 9.77E-02 | 1.16E-01 |
| BI-207 | 0.36 | 569.67 | * | 97.72 | 2.49E-02 | 2.85E-02 |
| | | 1063.62 | | 74.90 | | |
| TL-208 | 0.97 | 583.14 | * | 30.22 | 8.91E-01 | 2.09E-01 |
| | | 860.37 | * | 4.48 | 1.08E+00 | 1.00E+00 |
| | | 2614.66 | * | 35.85 | 7.08E-01 | 1.95E-01 |
| BI-212 | 0.68 | 727.17 | * | 11.80 | 3.95E-01 | 3.41E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.99 | 238.63 | * | 44.60 | 9.08E-01 | 1.16E-01 |
| | | 300.09 | * | 3.41 | 9.29E-01 | 8.51E-01 |
| BI-214 | 0.96 | 609.31 | * | 46.30 | 7.77E-01 | 1.59E-01 |
| | | 1120.29 | * | 15.10 | 8.58E-01 | 4.58E-01 |
| | | 1764.49 | * | 15.80 | 8.41E-01 | 3.71E-01 |
| | | 2204.22 | * | 4.98 | 1.67E+00 | 7.42E-01 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 8.99E-01 | 1.91E-01 |
| | | 351.92 | * | 37.19 | 9.17E-01 | 1.29E-01 |
| RA-226 | 0.98 | 186.21 | * | 3.28 | 1.77E+00 | 3.45E+00 |
| AC-228 | 0.98 | 338.32 | * | 11.40 | 9.13E-01 | 3.41E-01 |
| | | 911.07 | * | 27.70 | 1.00E+00 | 2.03E-01 |
| | | 969.11 | * | 16.60 | 1.07E+00 | 2.77E-01 |
| TH-234 | 0.98 | 63.29 | * | 3.80 | 1.17E+00 | 1.01E+00 |
| AM-243 | 0.99 | 74.67 | * | 66.00 | 1.69E-01 | 5.32E-02 |

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* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.932 | 1.65E+01 | 1.90E+00 | |
| X | CD-109 | 0.911 | | | |
| X | SN-126 | 0.986 | | | |
| | EU-155 | 0.923 | 1.41E-01 | 7.56E-02 | |
| | BI-207 | 0.364 | 2.49E-02 | 2.85E-02 | |
| | TL-208 | 0.972 | 7.99E-01 | 1.41E-01 | |
| | BI-212 | 0.688 | 3.95E-01 | 3.41E-01 | |
| | PB-212 | 0.999 | 9.09E-01 | 1.15E-01 | |
| | BI-214 | 0.960 | 8.23E-01 | 1.37E-01 | |
| | PB-214 | 0.996 | 9.12E-01 | 1.07E-01 | |
| | RA-226 | 0.989 | 1.77E+00 | 3.45E+00 | |
| | AC-228 | 0.983 | 1.00E+00 | 1.48E-01 | |
| | TH-234 | 0.981 | 1.17E+00 | 1.01E+00 | |
| X | NP-237 | 0.910 | | | |
| | AM-243 | 0.998 | 1.69E-01 | 5.32E-02 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

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# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 11:04:07AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| m | 3 | 77.26 | 1.31495E-01 | 9.66 | | |
| m | 5 | 92.30 | 4.69419E-02 | 23.23 | | |
| | 8 | 209.47 | 2.10334E-02 | 40.86 | Sum | |
| m | 10 | 242.23 | 5.08112E-02 | 17.05 | | |
| | 11 | 269.97 | 1.76740E-02 | 40.12 | | |
| | 12 | 276.21 | 1.81717E-02 | 38.19 | | |
| | 15 | 327.49 | 1.52811E-02 | 48.22 | | |
| M | 17 | 345.04 | 1.19980E-02 | 31.83 | Tol. | EU-152<br>HF-181 |
| m | 19 | 361.33 | 5.97979E-03 | 76.75 | | |
| | 20 | 463.47 | 1.78963E-02 | 33.81 | | |
| | 21 | 510.72 | 3.64563E-02 | 21.05 | | |
| | 26 | 770.01 | 1.46793E-02 | 37.27 | | |
| | 27 | 794.93 | 1.03129E-02 | 40.55 | Sum | |
| | 28 | 826.74 | 1.03533E-02 | 52.54 | | |
| | 29 | 837.72 | 1.36936E-02 | 28.85 | | |
| M | 31 | 895.24 | 4.62895E-03 | 29.40 | | |
| M | 33 | 964.76 | 1.13552E-02 | 30.59 | Sum | |
| m | 35 | 972.98 | 5.85045E-03 | 70.10 | | |
| | 36 | 1045.73 | 3.76634E-03 | 60.71 | | |
| | 38 | 1214.85 | 4.39542E-03 | 64.76 | | |
| | 39 | 1237.50 | 1.13638E-02 | 46.70 | Tol. | CO-56 |
| | 40 | 1377.44 | 4.82639E-03 | 63.83 | | |
| | 41 | 1409.55 | 5.98639E-03 | 52.91 | | |
| M | 43 | 1589.45 | 4.47190E-03 | 41.67 | Sum | |
| m | 44 | 1593.39 | 2.53702E-03 | 73.45 | D-Esc | |
| | 45 | 1621.72 | 3.24074E-03 | 51.96 | | |
| | 46 | 1635.43 | 5.25000E-03 | 44.95 | | |
| | 47 | 1694.86 | 2.46528E-03 | 66.42 | | |
| M | 48 | 1730.28 | 3.82529E-03 | 32.22 | Sum | |
| m | 49 | 1733.29 | 2.91426E-03 | 52.37 | | |
| | 51 | 1847.42 | 5.95433E-03 | 25.82 | | |
| | 52 | 1966.99 | 2.31061E-03 | 49.93 | | |
| | 53 | 2017.36 | 2.10648E-03 | 62.03 | | |

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| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 54 | 2058.26 | 2.17593E-03 | 57.09 | | |
| | 55 | 2105.57 | 3.38624E-03 | 55.82 | | |
| m | 57 | 2209.44 | 2.01672E-03 | 48.21 | | |
| | 58 | 2281.41 | 1.66667E-03 | 57.74 | | |
| | 59 | 2309.92 | 1.63194E-03 | 58.96 | Sum | |
| | 60 | 2345.77 | 4.72222E-03 | 24.25 | | |
| | 61 | 2448.77 | 3.46405E-03 | 41.76 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | | 10.42 | -1.71E-01 | 1.71E+00 | 1.71E+00 |
| + | NA-22 | 1274.54 | | 99.94 | 1.43E-02 | 6.90E-02 | 6.90E-02 |
| + | @ NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | AL-26 | 1808.65 | | 99.76 | -6.71E-03 | 3.55E-02 | 3.55E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.65E+01 | 7.91E-01 | 7.91E-01 |
| + | @ AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | TI-44 | 67.88 | | 94.40 | 1.12E-02 | 4.87E-02 | 4.87E-02 |
| | | 78.34 | | 96.00 | 1.06E-01 | | 6.25E-02 |
| + | SC-46 | 889.25 | | 99.98 | 5.65E-02 | 1.31E-01 | 1.31E-01 |
| | | 1120.51 | | 99.99 | 2.21E-01 | | 2.23E-01 |
| + | V-48 | 983.52 | | 99.98 | 4.78E-01 | 3.89E+00 | 3.89E+00 |
| | | 1312.10 | | 97.50 | 3.35E-01 | | 4.76E+00 |
| + | CR-51 | 320.08 | | 9.83 | -1.46E+00 | 5.50E+00 | 5.50E+00 |
| + | MN-54 | 834.83 | | 99.97 | -3.53E-02 | 7.44E-02 | 7.44E-02 |
| + | CO-56 | 846.75 | | 99.96 | -1.83E-02 | 1.34E-01 | 1.34E-01 |
| | | 1037.75 | | 14.03 | -1.43E-01 | | 9.41E-01 |
| | | 1238.25 | | 67.00 | 2.24E-01 | | 3.13E-01 |
| | | 1771.40 | | 15.51 | -1.91E-01 | | 7.44E-01 |
| | | 2598.48 | | 16.90 | 1.84E-01 | | 5.53E-01 |
| + | CO-57 | 122.06 | | 85.51 | 7.53E-03 | 5.88E-02 | 5.88E-02 |
| | | 136.48 | | 10.60 | -1.92E-01 | | 4.62E-01 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | CO-58 | 810.76 | | 99.40 | -5.74E-03 | 1.32E-01 | 1.32E-01 |
| + | FE-59 | 1099.22 | | 56.50 | 1.39E-01 | 5.34E-01 | 5.34E-01 |
| | | 1291.56 | | 43.20 | 3.68E-01 | | 7.08E-01 |
| + | CO-60 | 1173.22 | | 100.00 | 4.76E-03 | 5.80E-02 | 7.03E-02 |
| | | 1332.49 | | 100.00 | 2.14E-02 | | 5.80E-02 |
| + | ZN-65 | 1115.52 | | 50.75 | -1.81E-02 | 1.72E-01 | 1.72E-01 |
| + | GA-67 | 93.31 | | 35.70 | 3.46E+08 | 2.08E+08 | 2.08E+08 |
| | | 208.95 | | 2.24 | 1.44E+09 | | 2.81E+09 |
| | | 300.22 | | 16.00 | -7.39E+08 | | 4.43E+08 |
| + | SE-75 | 121.11 | | 16.70 | -5.69E-02 | 1.14E-01 | 4.07E-01 |
| | | 136.00 | | 59.20 | -4.74E-02 | | 1.14E-01 |
| | | 264.65 | | 59.80 | 6.64E-03 | | 1.33E-01 |
| | | 279.53 | | 25.20 | 8.32E-02 | | 3.41E-01 |
| | | 400.65 | | 11.40 | 4.46E-01 | | 7.43E-01 |
| + | RB-82 | 776.52 | | 13.00 | -7.58E-01 | 5.84E+00 | 5.84E+00 |
| + | RB-83 | 520.41 | | 46.00 | 2.63E-02 | 2.22E-01 | 2.22E-01 |
| | | 529.64 | | 30.30 | -3.08E-01 | | 3.01E-01 |
| | | 552.65 | | 16.40 | -1.51E-01 | | 6.20E-01 |
| + | KR-85 | 513.99 | | 0.43 | 2.48E+01 | 1.68E+01 | 1.68E+01 |
| + | SR-85 | 513.99 | | 99.27 | 3.08E-01 | 2.09E-01 | 2.09E-01 |
| + | Y-88 | 898.02 | | 93.40 | 1.10E-01 | 6.38E-02 | 1.18E-01 |
| | | 1836.01 | | 99.38 | -9.73E-03 | | 6.38E-02 |
| + | MO-93 | 263.06 | | 56.72 | 2.35E-02 | 4.20E-02 | 8.11E-02 |
| | | 684.67 | | 99.68 | -9.38E-03 | | 5.54E-02 |
| | | 1477.11 | | 99.08 | -3.20E-02 | | 4.20E-02 |
| + | NB-93M | 16.57 | | 9.43 | -6.46E-02 | 4.27E-01 | 4.27E-01 |
| + | NB-94 | 702.63 | | 100.00 | 6.25E-03 | 5.51E-02 | 5.51E-02 |
| | | 871.10 | | 100.00 | 2.01E-02 | | 5.52E-02 |
| + | NB-95 | 765.79 | | 99.81 | -3.86E-03 | 4.21E-01 | 4.21E-01 |
| + | NB-95M | 235.69 | | 25.00 | -2.24E+08 | 3.95E+07 | 3.95E+07 |
| + | ZR-95 | 724.18 | | 43.70 | 7.38E-02 | 2.93E-01 | 4.18E-01 |
| | | 756.72 | | 55.30 | 3.61E-02 | | 2.93E-01 |
| + | MO-99 | 181.06 | | 6.20 | 4.81E+09 | 2.97E+10 | 4.50E+10 |
| | | 739.58 | | 12.80 | 9.22E+09 | | 2.97E+10 |
| | | 778.00 | | 4.50 | 1.39E+10 | | 8.09E+10 |
| + | RU-103 | 497.08 | | 89.00 | -1.44E-01 | 2.90E-01 | 2.90E-01 |
| + | RU-106 | 621.84 | | 9.80 | 2.40E-01 | 6.38E-01 | 6.38E-01 |
| + | AG-108M | 433.93 | | 89.90 | -2.03E-02 | 4.77E-02 | 4.77E-02 |
| | | 614.37 | | 90.40 | 8.74E-03 | | 6.40E-02 |
| | | 722.95 | | 90.50 | 2.05E-02 | | 6.65E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 1.61E+00 | 3.02E+00 | 3.02E+00 |
| + | AG-110M | 657.75 | | 93.14 | -1.51E-02 | 7.22E-02 | 7.22E-02 |
| | | 677.61 | | 10.53 | 3.34E-01 | | 6.37E-01 |
| | | 706.67 | | 16.46 | -2.47E-02 | | 4.45E-01 |
| | | 763.93 | | 21.98 | 4.79E-02 | | 3.12E-01 |
| | | 884.67 | | 71.63 | 2.72E-02 | | 1.01E-01 |
| | | 1384.27 | | 23.94 | -4.13E-02 | | 2.74E-01 |
| + | CD-113M | 263.70 | | 0.02 | 3.48E+01 | 1.98E+02 | 1.98E+02 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | SN-113 | 255.12 | | 1.93 | -2.20E-01 | 1.28E-01 | 3.62E+00 |
| | | 391.69 | | 64.90 | 7.93E-03 | | 1.28E-01 |
| + | TE123M | 159.00 | | 84.10 | -9.26E-03 | 8.48E-02 | 8.48E-02 |
| + | SB-124 | 602.71 | | 97.87 | 4.21E-02 | 1.64E-01 | 1.64E-01 |
| | | 645.85 | | 7.26 | 1.09E+00 | | 2.43E+00 |
| | | 722.78 | | 11.10 | 5.23E-01 | | 1.70E+00 |
| | | 1691.02 | | 49.00 | 0.00E+00 | | 2.78E-01 |
| + | I-125 | 35.49 | | 6.49 | 2.92E-01 | 2.12E+00 | 2.12E+00 |
| + | SB-125 | 176.33 | | 6.89 | -2.60E-01 | 1.71E-01 | 5.77E-01 |
| | | 427.89 | | 29.33 | 8.67E-03 | | 1.71E-01 |
| | | 463.38 | | 10.35 | 6.15E-01 | | 5.86E-01 |
| | | 600.56 | | 17.80 | 9.53E-02 | | 3.15E-01 |
| | | 635.90 | | 11.32 | -3.34E-01 | | 4.21E-01 |
| + | SB-126 | 414.70 | | 83.30 | -6.07E+00 | 1.20E+01 | 1.41E+01 |
| | | 666.33 | | 99.60 | -7.98E+00 | | 1.20E+01 |
| | | 695.00 | | 99.60 | -1.73E-01 | | 1.44E+01 |
| | | 720.50 | | 53.80 | 2.32E+00 | | 2.73E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 1.40E-01 | 2.62E-01 | 2.62E-01 |
| + | SB-127 | 473.00 | | 25.00 | 9.22E+05 | 8.69E+06 | 1.06E+07 |
| | | 685.20 | | 35.70 | -1.47E+06 | | 8.69E+06 |
| | | 783.80 | | 14.70 | 5.32E+06 | | 2.23E+07 |
| + | I-129 | 29.78 | | 57.00 | -2.83E-03 | 8.16E-02 | 8.16E-02 |
| | | 33.60 | | 13.20 | 5.18E-02 | | 3.38E-01 |
| | | 39.58 | | 7.52 | 1.83E-02 | | 5.33E-01 |
| + | I-131 | 284.30 | | 6.05 | 2.79E+02 | 2.78E+02 | 3.98E+03 |
| | | 364.48 | | 81.20 | -1.05E+02 | | 2.78E+02 |
| | | 636.97 | | 7.26 | -1.41E+03 | | 3.25E+03 |
| | | 722.89 | | 1.80 | 5.34E+03 | | 1.73E+04 |
| + | TE-132 | 49.72 | | 13.10 | -3.67E+08 | 6.48E+07 | 4.41E+08 |
| | | 228.16 | | 88.00 | -2.68E+07 | | 6.48E+07 |
| + | BA-133 | 81.00 | | 33.00 | -4.63E-01 | 1.10E-01 | 1.38E-01 |
| | | 302.84 | | 17.80 | -4.10E-02 | | 2.69E-01 |
| | | 356.01 | | 60.00 | 7.40E-04 | | 1.10E-01 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -1.96E+05 | 5.83E+04 | 5.83E+04 |
| + | CS-134 | 563.23 | | 8.38 | -1.68E-01 | 6.71E-02 | 6.46E-01 |
| | | 569.32 | | 15.43 | -4.91E-02 | | 3.57E-01 |
| | | 604.70 | | 97.60 | 9.54E-03 | | 6.71E-02 |
| | | 795.84 | | 85.40 | 3.21E-02 | | 7.63E-02 |
| | | 801.93 | | 8.73 | -1.52E-01 | | 5.94E-01 |
| + | CS-135 | 268.24 | | 16.00 | 2.70E-01 | 3.13E-01 | 3.13E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | 5.64E+01 | 9.15E+00 | 1.02E+02 |
| | | 163.89 | | 4.61 | -1.85E+00 | | 1.61E+02 |
| | | 176.55 | | 13.56 | -2.30E+01 | | 5.09E+01 |
| | | 273.65 | | 12.66 | -2.91E+01 | | 7.29E+01 |
| | | 340.57 | | 48.50 | 2.93E+01 | | 2.37E+01 |

Analysis Report for 1707087-04

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| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | CS-136 | 818.50 | 99.70 | 1.44E+00 | 9.15E+00 | 9.15E+00 |
| | | 1048.07 | 79.60 | -1.58E+00 | | 1.15E+01 |
| | | 1235.34 | 19.70 | 5.18E+01 | | 8.12E+01 |
| + | CS-137 | 661.65 | 85.12 | 2.61E-02 | 6.18E-02 | 6.18E-02 |
| + | LA-138 | 788.74 | 34.00 | -3.70E-02 | 7.41E-02 | 1.59E-01 |
| | | 1435.80 | 66.00 | 3.42E-02 | | 7.41E-02 |
| + | CE-139 | 165.85 | 80.35 | 4.88E-02 | 8.28E-02 | 8.28E-02 |
| + | BA-140 | 162.64 | 6.70 | 4.45E+00 | 4.23E+01 | 1.30E+02 |
| | | 304.84 | 4.50 | -4.02E+01 | | 2.06E+02 |
| | | 423.70 | 3.20 | -1.41E+02 | | 2.96E+02 |
| | | 437.55 | 2.00 | -1.80E+02 | | 4.52E+02 |
| | | 537.32 | 25.00 | 1.50E+01 | | 4.23E+01 |
| + | LA-140 | 328.77 | 20.50 | 1.90E+01 | 9.06E+00 | 5.12E+01 |
| | | 487.03 | 45.50 | -1.48E+00 | | 2.38E+01 |
| | | 815.85 | 23.50 | 2.11E+01 | | 4.67E+01 |
| | | 1596.49 | 95.49 | 7.15E-01 | | 9.06E+00 |
| + | CE-141 | 145.44 | 48.40 | 2.07E-01 | 6.75E-01 | 6.75E-01 |
| + | @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | CE-144 | 133.54 | 10.80 | -6.60E-02 | 4.43E-01 | 4.43E-01 |
| + | PM-144 | 476.78 | 42.00 | -4.87E-02 | 6.29E-02 | 1.38E-01 |
| | | 618.01 | 98.60 | 9.72E-03 | | 6.29E-02 |
| | | 696.49 | 99.49 | -1.63E-02 | | 6.60E-02 |
| + | PM-145 | 36.85 | 21.70 | 1.23E-01 | 1.07E-01 | 2.02E-01 |
| | | 37.36 | 39.70 | -4.20E-03 | | 1.07E-01 |
| | | 42.30 | 15.10 | -9.86E-02 | | 2.63E-01 |
| | | 72.40 | 2.31 | -1.81E+00 | | 2.35E+00 |
| + | PM-146 | 453.90 | 39.94 | -2.36E-02 | 1.23E-01 | 1.23E-01 |
| | | 735.90 | 14.01 | 1.20E-01 | | 4.16E-01 |
| | | 747.13 | 13.10 | 2.50E-04 | | 4.07E-01 |
| + | ND-147 | 91.11 | 28.90 | 1.71E+02 | 9.83E+01 | 9.83E+01 |
| | | 531.02 | 13.10 | -3.51E+01 | | 1.76E+02 |
| + | PM-149 | 285.90 | 3.10 | -2.58E+13 | 4.65E+13 | 4.65E+13 |
| + | EU-152 | 121.78 | 20.50 | -2.65E-02 | 1.89E-01 | 1.89E-01 |
| | | 244.69 | 5.40 | 1.65E-01 | | 8.89E-01 |
| | | 344.27 | 19.13 | -1.08E-01 | | 2.59E-01 |
| | | 778.89 | 9.20 | 5.68E-02 | | 5.59E-01 |
| | | 964.01 | 10.40 | -1.78E+00 | | 7.22E-01 |
| | | 1085.78 | 7.22 | 1.31E-01 | | 8.10E-01 |
| | | 1112.02 | 9.60 | 1.87E-01 | | 7.29E-01 |
| | | 1407.95 | 14.94 | 1.99E-01 | | 4.31E-01 |
| + | GD-153 | 97.43 | 31.30 | 1.34E-01 | 1.71E-01 | 1.71E-01 |
| | | 103.18 | 22.20 | -3.57E-02 | | 2.24E-01 |
| + | EU-154 | 123.07 | 40.50 | 1.29E-02 | 9.95E-02 | 9.95E-02 |
| | | 723.30 | 19.70 | 9.62E-02 | | 3.12E-01 |
| | | 873.19 | 11.50 | -6.67E-03 | | 4.83E-01 |
| | | 996.32 | 10.30 | -4.68E-01 | | 5.13E-01 |
| | | 1004.76 | 17.90 | 1.59E-02 | | 3.60E-01 |

Analysis Report for 1707087-04

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | EU-154 | 1274.45 | | 35.50 | 3.81E-02 | 9.95E-02 | 1.85E-01 |
| + | EU-155 | 86.50 | * | 30.90 | 1.74E-01 | 1.90E-01 | 3.26E-01 |
| | | 105.30 | * | 20.70 | 9.77E-02 | | 1.90E-01 |
| + | EU-156 | 811.77 | | 10.40 | 1.50E+01 | 4.65E+01 | 4.65E+01 |
| | | 1153.47 | | 7.20 | -9.93E+00 | | 8.30E+01 |
| | | 1230.71 | | 8.90 | 1.74E+01 | | 7.42E+01 |
| + | HO-166M | 184.41 | | 72.60 | 1.07E-01 | 6.78E-02 | 6.78E-02 |
| | | 280.45 | | 29.60 | -6.74E-03 | | 1.60E-01 |
| | | 410.94 | | 11.10 | 1.30E-01 | | 4.45E-01 |
| | | 711.69 | | 54.10 | -1.10E-02 | | 9.90E-02 |
| + | TM-171 | 66.72 | | 0.14 | 7.52E+00 | 3.66E+01 | 3.66E+01 |
| + | HF-172 | 67.35 | | 5.31 | 2.19E-01 | 3.92E-01 | 9.55E-01 |
| | | 125.81 | | 11.30 | -1.65E-01 | | 3.92E-01 |
| + | LU-172 | 181.53 | | 20.60 | 5.78E+02 | 2.51E+03 | 5.41E+03 |
| | | 900.72 | | 29.81 | 6.95E+02 | | 5.02E+03 |
| | | 1093.66 | | 62.50 | -1.47E+03 | | 2.51E+03 |
| + | LU-173 | 100.72 | | 5.24 | -8.04E-02 | 2.80E-01 | 7.95E-01 |
| | | 272.11 | | 21.20 | 6.80E-02 | | 2.80E-01 |
| + | HF-175 | 343.40 | | 84.00 | -3.22E-01 | 1.57E-01 | 1.57E-01 |
| + | LU-176 | 88.34 | | 13.30 | -3.77E-01 | 4.45E-02 | 3.82E-01 |
| | | 201.83 | | 86.00 | -9.42E-03 | | 4.58E-02 |
| | | 306.78 | | 94.00 | 2.75E-03 | | 4.45E-02 |
| + | HF-181 | 133.02 | | 41.70 | -6.79E-02 | 3.11E-01 | 4.55E-01 |
| | | 345.85 | | 17.20 | -1.63E+00 | | 1.47E+00 |
| | | 482.03 | | 82.80 | 5.45E-03 | | 3.11E-01 |
| + | TA-182 | 67.75 | | 41.20 | 4.65E-02 | 2.03E-01 | 2.03E-01 |
| | | 1121.30 | | 34.90 | 7.29E-01 | | 5.20E-01 |
| | | 1189.05 | | 16.23 | -8.18E-01 | | 6.93E-01 |
| | | 1221.41 | | 26.98 | 8.74E-02 | | 4.60E-01 |
| | | 1231.02 | | 11.44 | 2.68E-01 | | 1.14E+00 |
| + | IR-192 | 308.46 | | 29.68 | 1.53E-01 | 2.43E-01 | 3.66E-01 |
| | | 468.07 | | 48.10 | -3.62E-02 | | 2.43E-01 |
| + | HG-203 | 279.19 | | 77.30 | 6.67E-02 | 2.74E-01 | 2.74E-01 |
| + | TL-204 | 374.74 | | 94.11 | 4.42E-03 | 5.18E-02 | 5.18E-02 |
| | | 899.15 | | 99.16 | 1.40E-02 | | 5.58E-02 |
| | | 911.74 | | 91.10 | 3.12E-01 | | 1.31E-01 |
| + | BI-207 | 569.67 | * | 97.72 | 2.49E-02 | 4.64E-02 | 4.64E-02 |
| | | 1063.62 | | 74.90 | 1.91E-02 | | 8.10E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 8.91E-01 | 1.62E-01 | 2.56E-01 |
| | | 860.37 | * | 4.48 | 1.08E+00 | | 1.61E+00 |
| | | 2614.66 | * | 35.85 | 7.08E-01 | | 1.62E-01 |
| + | BI-210M | 262.00 | | 45.00 | 7.40E-03 | 9.96E-02 | 9.96E-02 |
| | | 300.00 | | 23.00 | -6.09E-01 | | 2.26E-01 |
| + | PB-210 | 46.50 | | 4.25 | 1.15E-01 | 1.01E+00 | 1.01E+00 |
| + | PB-211 | 404.84 | | 2.90 | -1.90E+00 | 1.54E+00 | 1.54E+00 |
| | | 831.96 | | 2.90 | -8.92E-01 | | 2.00E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 3.95E-01 | 5.42E-01 | 5.42E-01 |
| | | 1620.62 | | 2.75 | 7.81E-01 | | 1.80E+00 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | PB-212 | 238.63 | * | 44.60 | 9.08E-01 | 2.41E-01 | 2.41E-01 |
| | | 300.09 | * | 3.41 | 9.29E-01 | | 2.33E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 7.77E-01 | 1.80E-01 | 1.80E-01 |
| | | 1120.29 | * | 15.10 | 8.58E-01 | | 6.99E-01 |
| | | 1764.49 | * | 15.80 | 8.41E-01 | | 5.09E-01 |
| | | 2204.22 | * | 4.98 | 1.67E+00 | | 8.55E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 8.99E-01 | 3.37E-01 | 4.15E-01 |
| | | 351.92 | * | 37.19 | 9.17E-01 | | 3.37E-01 |
| + | RN-219 | 401.80 | | 6.50 | -1.43E-01 | 7.01E-01 | 7.01E-01 |
| + | RA-223 | 323.87 | | 3.88 | -4.87E-03 | 1.18E+00 | 1.18E+00 |
| + | RA-224 | 240.98 | | 3.95 | 9.59E+00 | 2.13E+00 | 2.13E+00 |
| + | RA-225 | 40.00 | | 31.00 | -1.12E+01 | 1.32E+01 | 1.32E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.77E+00 | 1.88E+00 | 1.88E+00 |
| + | TH-227 | 50.10 | | 8.40 | -1.67E-01 | 4.59E-01 | 4.62E-01 |
| | | 236.00 | | 11.50 | -2.60E+00 | | 4.59E-01 |
| | | 256.20 | | 6.30 | -1.71E-01 | | 7.13E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 9.13E-01 | 5.04E-01 | 5.04E-01 |
| | | 911.07 | * | 27.70 | 1.00E+00 | | 5.60E-01 |
| | | 969.11 | * | 16.60 | 1.07E+00 | | 8.60E-01 |
| + | TH-230 | 48.44 | | 16.90 | 1.11E-01 | 2.51E-01 | 2.51E-01 |
| | | 62.85 | | 4.60 | 2.29E+00 | | 1.14E+00 |
| | | 67.67 | | 0.37 | 2.84E+00 | | 1.24E+01 |
| + | PA-231 | 283.67 | | 1.60 | 3.21E-01 | 2.05E+00 | 2.87E+00 |
| | | 302.67 | | 2.30 | -3.11E-01 | | 2.05E+00 |
| + | TH-231 | 25.64 | | 14.70 | -2.55E+00 | 4.07E-01 | 4.07E-01 |
| | | 84.21 | | 6.40 | -2.06E-01 | | 7.50E-01 |
| + | PA-233 | 311.98 | | 38.60 | -6.07E-01 | 1.45E+00 | 1.45E+00 |
| + | PA-234 | 131.20 | | 20.40 | 2.01E-03 | 1.92E-01 | 1.92E-01 |
| | | 733.99 | | 8.80 | 1.60E-01 | | 6.35E-01 |
| | | 946.00 | | 12.00 | -1.66E-01 | | 4.65E-01 |
| + | PA-234M | 1001.03 | | 0.92 | 4.48E+00 | 6.99E+00 | 6.99E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 1.17E+00 | 1.65E+00 | 1.65E+00 |
| + | U-235 | 143.76 | | 10.50 | 1.16E-02 | 3.78E-01 | 3.78E-01 |
| | | 163.35 | | 4.70 | -9.73E-03 | | 8.49E-01 |
| | | 205.31 | | 4.70 | 1.29E-01 | | 7.99E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 4.10E-01 | 7.69E-01 | 7.69E-01 |
| + | NP-239 | 106.10 | | 22.70 | -6.20E+10 | 8.42E+11 | 8.42E+11 |
| | | 228.18 | | 10.70 | -7.22E+11 | | 1.75E+12 |
| | | 277.60 | | 14.10 | 5.04E+11 | | 1.68E+12 |
| + | AM-241 | 59.54 | | 35.90 | 3.64E-02 | 1.24E-01 | 1.24E-01 |
| + | AM-243 | 74.67 | * | 66.00 | 1.69E-01 | 1.28E-01 | 1.28E-01 |
| + | CM-243 | 209.75 | | 3.29 | 1.33E+00 | 3.55E-01 | 1.38E+00 |
| | | 228.14 | | 10.60 | -1.53E-01 | | 3.70E-01 |
| | | 277.60 | | 14.00 | 1.07E-01 | | 3.55E-01 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.71E+00 | 1.71E+00 | -1.71E-01 | 8.10E-01 |
| | NA-22 | 1274.54 | | 99.94 | 6.90E-02 | 6.90E-02 | 1.43E-02 | 3.17E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 3.55E-02 | 3.55E-02 | -6.71E-03 | 1.43E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 7.91E-01 | 7.91E-01 | 1.65E+01 | 3.68E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 4.87E-02 | 4.87E-02 | 1.12E-02 | 2.38E-02 |
| | | 78.34 | | 96.00 | 6.25E-02 | | 1.06E-01 | 3.07E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.31E-01 | 1.31E-01 | 5.65E-02 | 6.07E-02 |
| | | 1120.51 | | 99.99 | 2.23E-01 | | 2.21E-01 | 1.06E-01 |
| | V-48 | 983.52 | | 99.98 | 3.89E+00 | 3.89E+00 | 4.78E-01 | 1.78E+00 |
| | | 1312.10 | | 97.50 | 4.76E+00 | | 3.35E-01 | 2.17E+00 |
| | CR-51 | 320.08 | | 9.83 | 5.50E+00 | 5.50E+00 | -1.46E+00 | 2.64E+00 |
| | MN-54 | 834.83 | | 99.97 | 7.44E-02 | 7.44E-02 | -3.53E-02 | 3.48E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.34E-01 | 1.34E-01 | -1.83E-02 | 6.22E-02 |
| | | 1037.75 | | 14.03 | 9.41E-01 | | -1.43E-01 | 4.32E-01 |
| | | 1238.25 | | 67.00 | 3.13E-01 | | 2.24E-01 | 1.47E-01 |
| | | 1771.40 | | 15.51 | 7.44E-01 | | -1.91E-01 | 3.20E-01 |
| | | 2598.48 | | 16.90 | 5.53E-01 | | 1.84E-01 | 2.14E-01 |
| | CO-57 | 122.06 | | 85.51 | 5.88E-02 | 5.88E-02 | 7.53E-03 | 2.86E-02 |
| | | 136.48 | | 10.60 | 4.62E-01 | | -1.92E-01 | 2.24E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.32E-01 | 1.32E-01 | -5.74E-03 | 6.09E-02 |
| | FE-59 | 1099.22 | | 56.50 | 5.34E-01 | 5.34E-01 | 1.39E-01 | 2.47E-01 |
| | | 1291.56 | | 43.20 | 7.08E-01 | | 3.68E-01 | 3.25E-01 |
| | CO-60 | 1173.22 | | 100.00 | 7.03E-02 | 5.80E-02 | 4.76E-03 | 3.26E-02 |
| | | 1332.49 | | 100.00 | 5.80E-02 | | 2.14E-02 | 2.62E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 1.72E-01 | 1.72E-01 | -1.81E-02 | 7.98E-02 |
| | GA-67 | 93.31 | | 35.70 | 2.08E+08 | 2.08E+08 | 3.46E+08 | 1.02E+08 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|
| GA-67 | 208.95 | | 2.24 | 2.81E+09 | 2.08E+08 | 1.44E+09 | 1.36E+09 |
| | 300.22 | | 16.00 | 4.43E+08 | | -7.39E+08 | 2.14E+08 |
| SE-75 | 121.11 | | 16.70 | 4.07E-01 | 1.14E-01 | -5.69E-02 | 1.97E-01 |
| | 136.00 | | 59.20 | 1.14E-01 | | -4.74E-02 | 5.52E-02 |
| | 264.65 | | 59.80 | 1.33E-01 | | 6.64E-03 | 6.38E-02 |
| | 279.53 | | 25.20 | 3.41E-01 | | 8.32E-02 | 1.65E-01 |
| | 400.65 | | 11.40 | 7.43E-01 | | 4.46E-01 | 3.55E-01 |
| RB-82 | 776.52 | | 13.00 | 5.84E+00 | 5.84E+00 | -7.58E-01 | 2.71E+00 |
| RB-83 | 520.41 | | 46.00 | 2.22E-01 | 2.22E-01 | 2.63E-02 | 1.05E-01 |
| | 529.64 | | 30.30 | 3.01E-01 | | -3.08E-01 | 1.40E-01 |
| | 552.65 | | 16.40 | 6.20E-01 | | -1.51E-01 | 2.91E-01 |
| KR-85 | 513.99 | | 0.43 | 1.68E+01 | 1.68E+01 | 2.48E+01 | 8.10E+00 |
| SR-85 | 513.99 | | 99.27 | 2.09E-01 | 2.09E-01 | 3.08E-01 | 1.00E-01 |
| Y-88 | 898.02 | | 93.40 | 1.18E-01 | 6.38E-02 | 1.10E-01 | 5.49E-02 |
| | 1836.01 | | 99.38 | 6.38E-02 | | -9.73E-03 | 2.53E-02 |
| MO-93 | 263.06 | | 56.72 | 8.11E-02 | 4.20E-02 | 2.35E-02 | 3.91E-02 |
| | 684.67 | | 99.68 | 5.54E-02 | | -9.38E-03 | 2.60E-02 |
| | 1477.11 | | 99.08 | 4.20E-02 | | -3.20E-02 | 1.80E-02 |
| NB-93M | 16.57 | | 9.43 | 4.27E-01 | 4.27E-01 | -6.46E-02 | 1.99E-01 |
| NB-94 | 702.63 | | 100.00 | 5.51E-02 | 5.51E-02 | 6.25E-03 | 2.58E-02 |
| | 871.10 | | 100.00 | 5.52E-02 | | 2.01E-02 | 2.56E-02 |
| NB-95 | 765.79 | | 99.81 | 4.21E-01 | 4.21E-01 | -3.86E-03 | 1.98E-01 |
| NB-95M | 235.69 | | 25.00 | 3.95E+07 | 3.95E+07 | -2.24E+08 | 1.92E+07 |
| ZR-95 | 724.18 | | 43.70 | 4.18E-01 | 2.93E-01 | 7.38E-02 | 1.97E-01 |
| | 756.72 | | 55.30 | 2.93E-01 | | 3.61E-02 | 1.37E-01 |
| MO-99 | 181.06 | | 6.20 | 4.50E+10 | 2.97E+10 | 4.81E+09 | 2.17E+10 |
| | 739.58 | | 12.80 | 2.97E+10 | | 9.22E+09 | 1.39E+10 |
| | 778.00 | | 4.50 | 8.09E+10 | | 1.39E+10 | 3.75E+10 |
| RU-103 | 497.08 | | 89.00 | 2.90E-01 | 2.90E-01 | -1.44E-01 | 1.36E-01 |
| RU-106 | 621.84 | | 9.80 | 6.38E-01 | 6.38E-01 | 2.40E-01 | 3.00E-01 |
| AG-108M | 433.93 | | 89.90 | 4.77E-02 | 4.77E-02 | -2.03E-02 | 2.25E-02 |
| | 614.37 | | 90.40 | 6.40E-02 | | 8.74E-03 | 3.03E-02 |
| | 722.95 | | 90.50 | 6.65E-02 | | 2.05E-02 | 3.14E-02 |
| CD-109 | 88.03 | * | 3.72 | 3.02E+00 | 3.02E+00 | 1.61E+00 | 1.49E+00 |
| AG-110M | 657.75 | | 93.14 | 7.22E-02 | 7.22E-02 | -1.51E-02 | 3.38E-02 |
| | 677.61 | | 10.53 | 6.37E-01 | | 3.34E-01 | 2.98E-01 |
| | 706.67 | | 16.46 | 4.45E-01 | | -2.47E-02 | 2.09E-01 |
| | 763.93 | | 21.98 | 3.12E-01 | | 4.79E-02 | 1.45E-01 |
| | 884.67 | | 71.63 | 1.01E-01 | | 2.72E-02 | 4.68E-02 |
| | 1384.27 | | 23.94 | 2.74E-01 | | -4.13E-02 | 1.22E-01 |
| CD-113M | 263.70 | | 0.02 | 1.98E+02 | 1.98E+02 | 3.48E+01 | 9.51E+01 |
| SN-113 | 255.12 | | 1.93 | 3.62E+00 | 1.28E-01 | -2.20E-01 | 1.73E+00 |
| | 391.69 | | 64.90 | 1.28E-01 | | 7.93E-03 | 6.09E-02 |
| TE123M | 159.00 | | 84.10 | 8.48E-02 | 8.48E-02 | -9.26E-03 | 4.11E-02 |
| SB-124 | 602.71 | | 97.87 | 1.64E-01 | 1.64E-01 | 4.21E-02 | 7.72E-02 |
| | 645.85 | | 7.26 | 2.43E+00 | | 1.09E+00 | 1.15E+00 |
| | 722.78 | | 11.10 | 1.70E+00 | | 5.23E-01 | 8.00E-01 |
| | 1691.02 | | 49.00 | 2.78E-01 | | 0.00E+00 | 1.18E-01 |
| I-125 | 35.49 | | 6.49 | 2.12E+00 | 2.12E+00 | 2.92E-01 | 1.02E+00 |
| SB-125 | 176.33 | | 6.89 | 5.77E-01 | 1.71E-01 | -2.60E-01 | 2.78E-01 |
| | 427.89 | | 29.33 | 1.71E-01 | | 8.67E-03 | 8.13E-02 |
| | 463.38 | | 10.35 | 5.86E-01 | | 6.15E-01 | 2.80E-01 |
| | 600.56 | | 17.80 | 3.15E-01 | | 9.53E-02 | 1.49E-01 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|
| SB-125 | 635.90 | | 11.32 | 4.21E-01 | 1.71E-01 | -3.34E-01 | 1.96E-01 |
| SB-126 | 414.70 | | 83.30 | 1.41E+01 | 1.20E+01 | -6.07E+00 | 6.69E+00 |
| | 666.33 | | 99.60 | 1.20E+01 | | -7.98E+00 | 5.60E+00 |
| | 695.00 | | 99.60 | 1.44E+01 | | -1.73E-01 | 6.79E+00 |
| | 720.50 | | 53.80 | 2.73E+01 | | 2.32E+00 | 1.28E+01 |
| SN-126 | 87.57 | * | 37.00 | 2.62E-01 | 2.62E-01 | 1.40E-01 | 1.30E-01 |
| SB-127 | 473.00 | | 25.00 | 1.06E+07 | 8.69E+06 | 9.22E+05 | 5.00E+06 |
| | 685.20 | | 35.70 | 8.69E+06 | | -1.47E+06 | 4.08E+06 |
| | 783.80 | | 14.70 | 2.23E+07 | | 5.32E+06 | 1.04E+07 |
| I-129 | 29.78 | | 57.00 | 8.16E-02 | 8.16E-02 | -2.83E-03 | 3.95E-02 |
| | 33.60 | | 13.20 | 3.38E-01 | | 5.18E-02 | 1.64E-01 |
| | 39.58 | | 7.52 | 5.33E-01 | | 1.83E-02 | 2.58E-01 |
| I-131 | 284.30 | | 6.05 | 3.98E+03 | 2.78E+02 | 2.79E+02 | 1.92E+03 |
| | 364.48 | | 81.20 | 2.78E+02 | | -1.05E+02 | 1.32E+02 |
| | 636.97 | | 7.26 | 3.25E+03 | | -1.41E+03 | 1.51E+03 |
| | 722.89 | | 1.80 | 1.73E+04 | | 5.34E+03 | 8.16E+03 |
| TE-132 | 49.72 | | 13.10 | 4.41E+08 | 6.48E+07 | -3.67E+08 | 2.14E+08 |
| | 228.16 | | 88.00 | 6.48E+07 | | -2.68E+07 | 3.11E+07 |
| BA-133 | 81.00 | | 33.00 | 1.38E-01 | 1.10E-01 | -4.63E-01 | 6.72E-02 |
| | 302.84 | | 17.80 | 2.69E-01 | | -4.10E-02 | 1.29E-01 |
| | 356.01 | | 60.00 | 1.10E-01 | | 7.40E-04 | 5.34E-02 |
| @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| XE-133 | 81.00 | | 38.00 | 5.83E+04 | 5.83E+04 | -1.96E+05 | 2.84E+04 |
| CS-134 | 563.23 | | 8.38 | 6.46E-01 | 6.71E-02 | -1.68E-01 | 3.04E-01 |
| | 569.32 | | 15.43 | 3.57E-01 | | -4.91E-02 | 1.68E-01 |
| | 604.70 | | 97.60 | 6.71E-02 | | 9.54E-03 | 3.19E-02 |
| | 795.84 | | 85.40 | 7.63E-02 | | 3.21E-02 | 3.58E-02 |
| | 801.93 | | 8.73 | 5.94E-01 | | -1.52E-01 | 2.74E-01 |
| CS-135 | 268.24 | | 16.00 | 3.13E-01 | 3.13E-01 | 2.70E-01 | 1.51E-01 |
| @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CS-136 | 153.22 | | 7.46 | 1.02E+02 | 9.15E+00 | 5.64E+01 | 4.95E+01 |
| | 163.89 | | 4.61 | 1.61E+02 | | -1.85E+00 | 7.81E+01 |
| | 176.55 | | 13.56 | 5.09E+01 | | -2.30E+01 | 2.46E+01 |
| | 273.65 | | 12.66 | 7.29E+01 | | -2.91E+01 | 3.52E+01 |
| | 340.57 | | 48.50 | 2.37E+01 | | 2.93E+01 | 1.15E+01 |
| | 818.50 | | 99.70 | 9.15E+00 | | 1.44E+00 | 4.22E+00 |
| | 1048.07 | | 79.60 | 1.15E+01 | | -1.58E+00 | 5.20E+00 |
| | 1235.34 | | 19.70 | 8.12E+01 | | 5.18E+01 | 3.82E+01 |
| CS-137 | 661.65 | | 85.12 | 6.18E-02 | 6.18E-02 | 2.61E-02 | 2.90E-02 |
| LA-138 | 788.74 | | 34.00 | 1.59E-01 | 7.41E-02 | -3.70E-02 | 7.41E-02 |
| | 1435.80 | | 66.00 | 7.41E-02 | | 3.42E-02 | 3.27E-02 |
| CE-139 | 165.85 | | 80.35 | 8.28E-02 | 8.28E-02 | 4.88E-02 | 4.01E-02 |
| BA-140 | 162.64 | | 6.70 | 1.30E+02 | 4.23E+01 | 4.45E+00 | 6.30E+01 |
| | 304.84 | | 4.50 | 2.06E+02 | | -4.02E+01 | 9.84E+01 |
| | 423.70 | | 3.20 | 2.96E+02 | | -1.41E+02 | 1.40E+02 |
| | 437.55 | | 2.00 | 4.52E+02 | | -1.80E+02 | 2.14E+02 |
| | 537.32 | | 25.00 | 4.23E+01 | | 1.50E+01 | 2.00E+01 |
| LA-140 | 328.77 | | 20.50 | 5.12E+01 | 9.06E+00 | 1.90E+01 | 2.46E+01 |
| | 487.03 | | 45.50 | 2.38E+01 | | -1.48E+00 | 1.13E+01 |
| | 815.85 | | 23.50 | 4.67E+01 | | 2.11E+01 | 2.16E+01 |
| | 1596.49 | | 95.49 | 9.06E+00 | | 7.15E-01 | 3.83E+00 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | CE-141 | 145.44 | | 48.40 | 6.75E-01 | 6.75E-01 | 2.07E-01 | 3.27E-01 |
| @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-144 | 133.54 | | 10.80 | 4.43E-01 | 4.43E-01 | -6.60E-02 | 2.15E-01 |
| | PM-144 | 476.78 | | 42.00 | 1.38E-01 | 6.29E-02 | -4.87E-02 | 6.52E-02 |
| | | 618.01 | | 98.60 | 6.29E-02 | | 9.72E-03 | 2.96E-02 |
| | | 696.49 | | 99.49 | 6.60E-02 | | -1.63E-02 | 3.10E-02 |
| | PM-145 | 36.85 | | 21.70 | 2.02E-01 | 1.07E-01 | 1.23E-01 | 9.81E-02 |
| | | 37.36 | | 39.70 | 1.07E-01 | | -4.20E-03 | 5.18E-02 |
| | | 42.30 | | 15.10 | 2.63E-01 | | -9.86E-02 | 1.27E-01 |
| | | 72.40 | | 2.31 | 2.35E+00 | | -1.81E+00 | 1.15E+00 |
| | PM-146 | 453.90 | | 39.94 | 1.23E-01 | 1.23E-01 | -2.36E-02 | 5.83E-02 |
| | | 735.90 | | 14.01 | 4.16E-01 | | 1.20E-01 | 1.95E-01 |
| | | 747.13 | | 13.10 | 4.07E-01 | | 2.50E-04 | 1.89E-01 |
| | ND-147 | 91.11 | | 28.90 | 9.83E+01 | 9.83E+01 | 1.71E+02 | 4.82E+01 |
| | | 531.02 | | 13.10 | 1.76E+02 | | -3.51E+01 | 8.24E+01 |
| | PM-149 | 285.90 | | 3.10 | 4.65E+13 | 4.65E+13 | -2.58E+13 | 2.24E+13 |
| | EU-152 | 121.78 | | 20.50 | 1.89E-01 | 1.89E-01 | -2.65E-02 | 9.19E-02 |
| | | 244.69 | | 5.40 | 8.89E-01 | | 1.65E-01 | 4.30E-01 |
| | | 344.27 | | 19.13 | 2.59E-01 | | -1.08E-01 | 1.24E-01 |
| | | 778.89 | | 9.20 | 5.59E-01 | | 5.68E-02 | 2.59E-01 |
| | | 964.01 | | 10.40 | 7.22E-01 | | -1.78E+00 | 3.40E-01 |
| | | 1085.78 | | 7.22 | 8.10E-01 | | 1.31E-01 | 3.72E-01 |
| | | 1112.02 | | 9.60 | 7.29E-01 | | 1.87E-01 | 3.39E-01 |
| | | 1407.95 | | 14.94 | 4.31E-01 | | 1.99E-01 | 1.96E-01 |
| | GD-153 | 97.43 | | 31.30 | 1.71E-01 | 1.71E-01 | 1.34E-01 | 8.32E-02 |
| | | 103.18 | | 22.20 | 2.24E-01 | | -3.57E-02 | 1.09E-01 |
| | EU-154 | 123.07 | | 40.50 | 9.95E-02 | 9.95E-02 | 1.29E-02 | 4.83E-02 |
| | | 723.30 | | 19.70 | 3.12E-01 | | 9.62E-02 | 1.47E-01 |
| | | 873.19 | | 11.50 | 4.83E-01 | | -6.67E-03 | 2.24E-01 |
| | | 996.32 | | 10.30 | 5.13E-01 | | -4.68E-01 | 2.35E-01 |
| | | 1004.76 | | 17.90 | 3.60E-01 | | 1.59E-02 | 1.67E-01 |
| | | 1274.45 | | 35.50 | 1.85E-01 | | 3.81E-02 | 8.47E-02 |
| + | EU-155 | 86.50 | * | 30.90 | 3.26E-01 | 1.90E-01 | 1.74E-01 | 1.61E-01 |
| | | 105.30 | * | 20.70 | 1.90E-01 | | 9.77E-02 | 9.23E-02 |
| | EU-156 | 811.77 | | 10.40 | 4.65E+01 | 4.65E+01 | 1.50E+01 | 2.16E+01 |
| | | 1153.47 | | 7.20 | 8.30E+01 | | -9.93E+00 | 3.83E+01 |
| | | 1230.71 | | 8.90 | 7.42E+01 | | 1.74E+01 | 3.44E+01 |
| | HO-166M | 184.41 | | 72.60 | 6.78E-02 | 6.78E-02 | 1.07E-01 | 3.30E-02 |
| | | 280.45 | | 29.60 | 1.60E-01 | | -6.74E-03 | 7.69E-02 |
| | | 410.94 | | 11.10 | 4.45E-01 | | 1.30E-01 | 2.13E-01 |
| | | 711.69 | | 54.10 | 9.90E-02 | | -1.10E-02 | 4.64E-02 |
| | TM-171 | 66.72 | | 0.14 | 3.66E+01 | 3.66E+01 | 7.52E+00 | 1.79E+01 |
| | HF-172 | 67.35 | | 5.31 | 9.55E-01 | 3.92E-01 | 2.19E-01 | 4.66E-01 |
| | | 125.81 | | 11.30 | 3.92E-01 | | -1.65E-01 | 1.90E-01 |
| | LU-172 | 181.53 | | 20.60 | 5.41E+03 | 2.51E+03 | 5.78E+02 | 2.61E+03 |
| | | 900.72 | | 29.81 | 5.02E+03 | | 6.95E+02 | 2.31E+03 |
| | | 1093.66 | | 62.50 | 2.51E+03 | | -1.47E+03 | 1.15E+03 |
| | LU-173 | 100.72 | | 5.24 | 7.95E-01 | 2.80E-01 | -8.04E-02 | 3.86E-01 |
| | | 272.11 | | 21.20 | 2.80E-01 | | 6.80E-02 | 1.35E-01 |
| | HF-175 | 343.40 | | 84.00 | 1.57E-01 | 1.57E-01 | -3.22E-01 | 7.51E-02 |
| | LU-176 | 88.34 | | 13.30 | 3.82E-01 | 4.45E-02 | -3.77E-01 | 1.87E-01 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | LU-176 | 201.83 | | 86.00 | 4.58E-02 | 4.45E-02 | -9.42E-03 | 2.21E-02 |
| | | 306.78 | | 94.00 | 4.45E-02 | | 2.75E-03 | 2.13E-02 |
| | HF-181 | 133.02 | | 41.70 | 4.55E-01 | 3.11E-01 | -6.79E-02 | 2.21E-01 |
| | | 345.85 | | 17.20 | 1.47E+00 | | -1.63E+00 | 7.05E-01 |
| | | 482.03 | | 82.80 | 3.11E-01 | | 5.45E-03 | 1.48E-01 |
| | TA-182 | 67.75 | | 41.20 | 2.03E-01 | 2.03E-01 | 4.65E-02 | 9.90E-02 |
| | | 1121.30 | | 34.90 | 5.20E-01 | | 7.29E-01 | 2.47E-01 |
| | | 1189.05 | | 16.23 | 6.93E-01 | | -8.18E-01 | 3.18E-01 |
| | | 1221.41 | | 26.98 | 4.60E-01 | | 8.74E-02 | 2.13E-01 |
| | | 1231.02 | | 11.44 | 1.14E+00 | | 2.68E-01 | 5.28E-01 |
| | IR-192 | 308.46 | | 29.68 | 3.66E-01 | 2.43E-01 | 1.53E-01 | 1.75E-01 |
| | | 468.07 | | 48.10 | 2.43E-01 | | -3.62E-02 | 1.15E-01 |
| | HG-203 | 279.19 | | 77.30 | 2.74E-01 | 2.74E-01 | 6.67E-02 | 1.32E-01 |
| | TL-204 | 374.74 | | 94.11 | 5.18E-02 | 5.18E-02 | 4.42E-03 | 2.47E-02 |
| | | 899.15 | | 99.16 | 5.58E-02 | | 1.40E-02 | 2.58E-02 |
| | | 911.74 | | 91.10 | 1.31E-01 | | 3.12E-01 | 6.31E-02 |
| + | BI-207 | 569.67 | * | 97.72 | 4.64E-02 | 4.64E-02 | 2.49E-02 | 2.17E-02 |
| | | 1063.62 | | 74.90 | 8.10E-02 | | 1.91E-02 | 3.74E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 2.56E-01 | 1.62E-01 | 8.91E-01 | 1.23E-01 |
| | | 860.37 | * | 4.48 | 1.61E+00 | | 1.08E+00 | 7.59E-01 |
| | | 2614.66 | * | 35.85 | 1.62E-01 | | 7.08E-01 | 6.84E-02 |
| | BI-210M | 262.00 | | 45.00 | 9.96E-02 | 9.96E-02 | 7.40E-03 | 4.80E-02 |
| | | 300.00 | | 23.00 | 2.26E-01 | | -6.09E-01 | 1.09E-01 |
| | PB-210 | 46.50 | | 4.25 | 1.01E+00 | 1.01E+00 | 1.15E-01 | 4.90E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.54E+00 | 1.54E+00 | -1.90E+00 | 7.34E-01 |
| | | 831.96 | | 2.90 | 2.00E+00 | | -8.92E-01 | 9.33E-01 |
| + | BI-212 | 727.17 | * | 11.80 | 5.42E-01 | 5.42E-01 | 3.95E-01 | 2.56E-01 |
| | | 1620.62 | | 2.75 | 1.80E+00 | | 7.81E-01 | 7.86E-01 |
| + | PB-212 | 238.63 | * | 44.60 | 2.41E-01 | 2.41E-01 | 9.08E-01 | 1.19E-01 |
| | | 300.09 | * | 3.41 | 2.33E+00 | | 9.29E-01 | 1.14E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 1.80E-01 | 1.80E-01 | 7.77E-01 | 8.68E-02 |
| | | 1120.29 | * | 15.10 | 6.99E-01 | | 8.58E-01 | 3.34E-01 |
| | | 1764.49 | * | 15.80 | 5.09E-01 | | 8.41E-01 | 2.34E-01 |
| | | 2204.22 | * | 4.98 | 8.55E-01 | | 1.67E+00 | 3.49E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 4.15E-01 | 3.37E-01 | 8.99E-01 | 2.03E-01 |
| | | 351.92 | * | 37.19 | 3.37E-01 | | 9.17E-01 | 1.66E-01 |
| | RN-219 | 401.80 | | 6.50 | 7.01E-01 | 7.01E-01 | -1.43E-01 | 3.33E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.18E+00 | 1.18E+00 | -4.87E-03 | 5.64E-01 |
| | RA-224 | 240.98 | | 3.95 | 2.13E+00 | 2.13E+00 | 9.59E+00 | 1.05E+00 |
| | RA-225 | 40.00 | | 31.00 | 1.32E+01 | 1.32E+01 | -1.12E+01 | 6.39E+00 |
| + | RA-226 | 186.21 | * | 3.28 | 1.88E+00 | 1.88E+00 | 1.77E+00 | 9.19E-01 |
| | TH-227 | 50.10 | | 8.40 | 4.62E-01 | 4.59E-01 | -1.67E-01 | 2.24E-01 |
| | | 236.00 | | 11.50 | 4.59E-01 | | -2.60E+00 | 2.23E-01 |
| | | 256.20 | | 6.30 | 7.13E-01 | | -1.71E-01 | 3.44E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 5.04E-01 | 5.04E-01 | 9.13E-01 | 2.43E-01 |
| | | 911.07 | * | 27.70 | 5.60E-01 | | 1.00E+00 | 2.73E-01 |
| | | 969.11 | * | 16.60 | 8.60E-01 | | 1.07E+00 | 4.17E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.51E-01 | 2.51E-01 | 1.11E-01 | 1.22E-01 |
| | | 62.85 | | 4.60 | 1.14E+00 | | 2.29E+00 | 5.56E-01 |
| | | 67.67 | | 0.37 | 1.24E+01 | | 2.84E+00 | 6.05E+00 |
| | PA-231 | 283.67 | | 1.60 | 2.87E+00 | 2.05E+00 | 3.21E-01 | 1.38E+00 |
| | | 302.67 | | 2.30 | 2.05E+00 | | -3.11E-01 | 9.83E-01 |
| | TH-231 | 25.64 | | 14.70 | 4.07E-01 | 4.07E-01 | -2.55E+00 | 1.97E-01 |

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TH-231 | 84.21 | | 6.40 | 7.50E-01 | 4.07E-01 | -2.06E-01 | 3.66E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.45E+00 | 1.45E+00 | -6.07E-01 | 6.94E-01 |
| | PA-234 | 131.20 | | 20.40 | 1.92E-01 | 1.92E-01 | 2.01E-03 | 9.34E-02 |
| | | 733.99 | | 8.80 | 6.35E-01 | | 1.60E-01 | 2.98E-01 |
| | | 946.00 | | 12.00 | 4.65E-01 | | -1.66E-01 | 2.15E-01 |
| | PA-234M | 1001.03 | | 0.92 | 6.99E+00 | 6.99E+00 | 4.48E+00 | 3.25E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 1.65E+00 | 1.65E+00 | 1.17E+00 | 8.10E-01 |
| | U-235 | 143.76 | | 10.50 | 3.78E-01 | 3.78E-01 | 1.16E-02 | 1.83E-01 |
| | | 163.35 | | 4.70 | 8.49E-01 | | -9.73E-03 | 4.11E-01 |
| | | 205.31 | | 4.70 | 7.99E-01 | | 1.29E-01 | 3.85E-01 |
| | NP-237 | 86.50 | * | 12.60 | 7.69E-01 | 7.69E-01 | 4.10E-01 | 3.80E-01 |
| | NP-239 | 106.10 | | 22.70 | 8.42E+11 | 8.42E+11 | -6.20E+10 | 4.09E+11 |
| | | 228.18 | | 10.70 | 1.75E+12 | | -7.22E+11 | 8.39E+11 |
| | | 277.60 | | 14.10 | 1.68E+12 | | 5.04E+11 | 8.10E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.24E-01 | 1.24E-01 | 3.64E-02 | 6.05E-02 |
| + | AM-243 | 74.67 | * | 66.00 | 1.28E-01 | 1.28E-01 | 1.69E-01 | 6.34E-02 |
| | CM-243 | 209.75 | | 3.29 | 1.38E+00 | 3.55E-01 | 1.33E+00 | 6.67E-01 |
| | | 228.14 | | 10.60 | 3.70E-01 | | -1.53E-01 | 1.78E-01 |
| | | 277.60 | | 14.00 | 3.55E-01 | | 1.07E-01 | 1.71E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

Analysis Report for 1707087-04

HTC-A03-S002-0006-01

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-0006-01

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 63 | 69 | 63 | 155 | 494 | 151 |
| 25: | 44 | 73 | 51 | 56 | 60 | 54 | 60 | 58 |
| 33: | 63 | 52 | 77 | 66 | 61 | 71 | 63 | 60 |
| 41: | 57 | 60 | 62 | 77 | 64 | 78 | 125 | 79 |
| 49: | 65 | 82 | 73 | 75 | 67 | 79 | 84 | 71 |
| 57: | 82 | 111 | 99 | 91 | 123 | 108 | 145 | 244 |
| 65: | 134 | 104 | 130 | 130 | 107 | 119 | 121 | 122 |
| 73: | 130 | 169 | 284 | 251 | 272 | 406 | 135 | 115 |
| 81: | 107 | 129 | 94 | 124 | 147 | 126 | 168 | 180 |
| 89: | 130 | 125 | 133 | 122 | 265 | 189 | 93 | 83 |
| 97: | 99 | 93 | 78 | 94 | 68 | 55 | 63 | 69 |
| 105: | 97 | 94 | 71 | 82 | 81 | 97 | 75 | 65 |
| 113: | 81 | 84 | 77 | 73 | 77 | 68 | 67 | 66 |
| 121: | 76 | 86 | 61 | 76 | 80 | 82 | 74 | 80 |
| 129: | 101 | 89 | 73 | 77 | 69 | 58 | 62 | 64 |
| 137: | 66 | 56 | 85 | 76 | 87 | 62 | 68 | 91 |
| 145: | 60 | 68 | 70 | 52 | 67 | 56 | 59 | 82 |
| 153: | 57 | 73 | 73 | 69 | 59 | 67 | 70 | 73 |
| 161: | 62 | 57 | 62 | 78 | 65 | 55 | 63 | 59 |
| 169: | 50 | 51 | 62 | 66 | 58 | 67 | 57 | 51 |
| 177: | 48 | 57 | 40 | 56 | 53 | 55 | 59 | 48 |
| 185: | 63 | 148 | 115 | 56 | 57 | 52 | 50 | 61 |
| 193: | 58 | 43 | 62 | 55 | 60 | 53 | 60 | 46 |
| 201: | 56 | 54 | 49 | 42 | 47 | 53 | 36 | 42 |
| 209: | 71 | 101 | 45 | 53 | 49 | 45 | 46 | 47 |
| 217: | 50 | 44 | 54 | 50 | 55 | 45 | 35 | 57 |
| 225: | 45 | 35 | 41 | 50 | 34 | 43 | 41 | 55 |
| 233: | 50 | 49 | 46 | 60 | 57 | 164 | 476 | 172 |
| 241: | 79 | 110 | 118 | 46 | 41 | 40 | 42 | 34 |
| 249: | 42 | 34 | 44 | 40 | 42 | 43 | 33 | 33 |
| 257: | 39 | 28 | 33 | 33 | 37 | 32 | 32 | 29 |
| 265: | 38 | 36 | 28 | 34 | 34 | 63 | 60 | 31 |
| 273: | 25 | 32 | 44 | 44 | 37 | 50 | 30 | 32 |
| 281: | 27 | 41 | 35 | 23 | 30 | 36 | 29 | 32 |
| 289: | 28 | 38 | 37 | 33 | 28 | 26 | 127 | 155 |
| 297: | 47 | 38 | 27 | 47 | 44 | 31 | 31 | 19 |
| 305: | 18 | 22 | 21 | 30 | 27 | 26 | 23 | 21 |
| 313: | 17 | 27 | 34 | 29 | 34 | 28 | 24 | 20 |
| 321: | 29 | 21 | 24 | 24 | 28 | 26 | 29 | 45 |
| 329: | 39 | 21 | 21 | 20 | 21 | 28 | 22 | 17 |
| 337: | 22 | 67 | 98 | 52 | 28 | 19 | 22 | 30 |
| 345: | 41 | 28 | 26 | 24 | 26 | 22 | 78 | 240 |
| 353: | 177 | 34 | 27 | 23 | 25 | 19 | 22 | 19 |
| 361: | 14 | 26 | 20 | 15 | 32 | 15 | 12 | 17 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 28 | 24 | 18 | 24 | 22 | 23 | 23 | 23 |

Sample Title: HTC-A03-S002-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 18 | 17 | 18 | 23 | 18 | 15 | 19 | 24 |
| 385: | 22 | 23 | 23 | 20 | 19 | 18 | 27 | 15 |
| 393: | 18 | 16 | 23 | 16 | 18 | 27 | 16 | 19 |
| 401: | 22 | 18 | 19 | 23 | 13 | 16 | 21 | 14 |
| 409: | 31 | 33 | 19 | 13 | 21 | 18 | 22 | 16 |
| 417: | 13 | 22 | 17 | 18 | 12 | 18 | 14 | 22 |
| 425: | 16 | 13 | 15 | 21 | 20 | 23 | 17 | 19 |
| 433: | 15 | 16 | 11 | 14 | 9 | 9 | 21 | 17 |
| 441: | 14 | 16 | 18 | 17 | 10 | 9 | 21 | 16 |
| 449: | 15 | 12 | 16 | 19 | 17 | 21 | 12 | 15 |
| 457: | 17 | 29 | 14 | 13 | 14 | 16 | 47 | 35 |
| 465: | 18 | 17 | 17 | 14 | 15 | 12 | 12 | 15 |
| 473: | 16 | 13 | 19 | 17 | 12 | 16 | 15 | 18 |
| 481: | 19 | 22 | 17 | 14 | 18 | 18 | 22 | 13 |
| 489: | 19 | 13 | 18 | 13 | 13 | 12 | 14 | 15 |
| 497: | 12 | 12 | 14 | 11 | 22 | 15 | 12 | 12 |
| 505: | 11 | 17 | 17 | 18 | 27 | 38 | 91 | 59 |
| 513: | 24 | 17 | 14 | 9 | 14 | 17 | 9 | 10 |
| 521: | 13 | 13 | 14 | 12 | 17 | 7 | 9 | 6 |
| 529: | 13 | 8 | 10 | 8 | 13 | 19 | 18 | 15 |
| 537: | 6 | 14 | 16 | 7 | 11 | 12 | 14 | 16 |
| 545: | 7 | 13 | 15 | 15 | 10 | 20 | 10 | 12 |
| 553: | 8 | 11 | 11 | 7 | 9 | 17 | 15 | 13 |
| 561: | 8 | 18 | 9 | 16 | 15 | 11 | 9 | 18 |
| 569: | 15 | 19 | 10 | 10 | 9 | 17 | 15 | 15 |
| 577: | 6 | 10 | 15 | 21 | 20 | 38 | 109 | 106 |
| 585: | 20 | 13 | 9 | 12 | 16 | 17 | 13 | 11 |
| 593: | 17 | 8 | 10 | 10 | 15 | 14 | 11 | 16 |
| 601: | 10 | 10 | 16 | 15 | 8 | 12 | 18 | 41 |
| 609: | 159 | 155 | 36 | 11 | 10 | 12 | 18 | 14 |
| 617: | 8 | 8 | 14 | 11 | 11 | 13 | 9 | 11 |
| 625: | 16 | 14 | 8 | 10 | 9 | 12 | 17 | 11 |
| 633: | 6 | 12 | 15 | 5 | 7 | 5 | 9 | 9 |
| 641: | 15 | 11 | 15 | 15 | 9 | 9 | 16 | 16 |
| 649: | 15 | 10 | 7 | 9 | 15 | 9 | 13 | 11 |
| 657: | 8 | 6 | 9 | 15 | 13 | 13 | 11 | 7 |
| 665: | 10 | 8 | 11 | 4 | 10 | 10 | 14 | 16 |
| 673: | 7 | 7 | 13 | 12 | 10 | 6 | 9 | 8 |
| 681: | 13 | 7 | 7 | 9 | 11 | 20 | 14 | 12 |
| 689: | 19 | 10 | 11 | 15 | 16 | 11 | 14 | 10 |
| 697: | 11 | 7 | 9 | 17 | 8 | 5 | 12 | 12 |
| 705: | 15 | 10 | 10 | 15 | 7 | 11 | 12 | 16 |
| 713: | 8 | 4 | 15 | 6 | 14 | 7 | 10 | 12 |
| 721: | 10 | 16 | 14 | 15 | 9 | 15 | 19 | 30 |
| 729: | 20 | 8 | 9 | 10 | 11 | 14 | 6 | 12 |
| 737: | 14 | 8 | 12 | 8 | 10 | 7 | 8 | 10 |
| 745: | 4 | 7 | 12 | 9 | 11 | 9 | 9 | 11 |
| 753: | 6 | 8 | 13 | 12 | 14 | 9 | 8 | 7 |
| 761: | 9 | 11 | 7 | 9 | 6 | 9 | 10 | 21 |
| 769: | 18 | 17 | 9 | 10 | 14 | 9 | 8 | 5 |
| 777: | 8 | 3 | 11 | 10 | 11 | 8 | 8 | 10 |
| 785: | 15 | 8 | 12 | 9 | 6 | 9 | 5 | 14 |
| 793: | 7 | 13 | 23 | 10 | 7 | 11 | 5 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 8 | 7 | 5 | 7 | 7 | 8 | 9 | 2 |

Sample Title: HTC-A03-S002-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 6 | 4 | 6 | 12 | 9 | 11 | 8 | 4 |
| 817: | 10 | 6 | 4 | 2 | 14 | 8 | 8 | 5 |
| 825: | 4 | 9 | 7 | 10 | 13 | 11 | 13 | 6 |
| 833: | 6 | 5 | 13 | 19 | 10 | 12 | 11 | 17 |
| 841: | 3 | 6 | 11 | 11 | 5 | 8 | 6 | 10 |
| 849: | 11 | 9 | 12 | 8 | 10 | 5 | 7 | 6 |
| 857: | 6 | 8 | 9 | 19 | 16 | 13 | 8 | 4 |
| 865: | 6 | 1 | 10 | 10 | 5 | 6 | 6 | 12 |
| 873: | 10 | 7 | 5 | 8 | 9 | 7 | 5 | 5 |
| 881: | 4 | 5 | 12 | 7 | 8 | 8 | 10 | 8 |
| 889: | 7 | 9 | 11 | 6 | 5 | 5 | 13 | 3 |
| 897: | 7 | 9 | 9 | 8 | 10 | 2 | 2 | 4 |
| 905: | 6 | 8 | 5 | 8 | 11 | 38 | 87 | 65 |
| 913: | 18 | 11 | 11 | 10 | 4 | 10 | 5 | 10 |
| 921: | 6 | 5 | 11 | 9 | 5 | 5 | 7 | 5 |
| 929: | 10 | 8 | 12 | 9 | 8 | 13 | 13 | 2 |
| 937: | 9 | 6 | 6 | 4 | 10 | 7 | 4 | 2 |
| 945: | 7 | 9 | 5 | 10 | 13 | 9 | 10 | 8 |
| 953: | 7 | 3 | 6 | 8 | 9 | 12 | 4 | 14 |
| 961: | 11 | 6 | 12 | 20 | 25 | 11 | 4 | 28 |
| 969: | 61 | 25 | 8 | 14 | 7 | 7 | 4 | 4 |
| 977: | 4 | 4 | 11 | 1 | 5 | 6 | 9 | 5 |
| 985: | 8 | 7 | 7 | 5 | 6 | 8 | 9 | 4 |
| 993: | 5 | 2 | 5 | 11 | 4 | 6 | 6 | 11 |
| 1001: | 14 | 11 | 8 | 6 | 4 | 3 | 13 | 6 |
| 1009: | 10 | 3 | 8 | 5 | 7 | 7 | 9 | 8 |
| 1017: | 3 | 3 | 4 | 5 | 6 | 4 | 6 | 9 |
| 1025: | 10 | 5 | 5 | 6 | 8 | 3 | 8 | 8 |
| 1033: | 10 | 6 | 10 | 4 | 2 | 6 | 6 | 8 |
| 1041: | 6 | 4 | 6 | 4 | 10 | 8 | 4 | 2 |
| 1049: | 3 | 2 | 3 | 5 | 4 | 9 | 6 | 6 |
| 1057: | 4 | 5 | 10 | 5 | 7 | 9 | 6 | 8 |
| 1065: | 9 | 5 | 3 | 6 | 10 | 10 | 12 | 3 |
| 1073: | 5 | 8 | 7 | 13 | 4 | 7 | 16 | 4 |
| 1081: | 5 | 7 | 7 | 4 | 7 | 7 | 5 | 6 |
| 1089: | 9 | 3 | 6 | 5 | 8 | 4 | 7 | 5 |
| 1097: | 10 | 7 | 8 | 9 | 9 | 6 | 7 | 7 |
| 1105: | 1 | 10 | 9 | 5 | 7 | 9 | 13 | 6 |
| 1113: | 9 | 6 | 11 | 8 | 7 | 8 | 14 | 50 |
| 1121: | 29 | 12 | 7 | 11 | 11 | 4 | 12 | 6 |
| 1129: | 5 | 5 | 7 | 3 | 8 | 6 | 5 | 8 |
| 1137: | 8 | 9 | 10 | 5 | 11 | 12 | 7 | 11 |
| 1145: | 6 | 3 | 8 | 8 | 8 | 7 | 3 | 6 |
| 1153: | 5 | 8 | 12 | 9 | 8 | 7 | 8 | 4 |
| 1161: | 10 | 9 | 12 | 7 | 8 | 11 | 10 | 7 |
| 1169: | 6 | 6 | 7 | 9 | 12 | 4 | 11 | 5 |
| 1177: | 6 | 10 | 10 | 3 | 8 | 4 | 5 | 8 |
| 1185: | 11 | 9 | 3 | 2 | 6 | 11 | 9 | 3 |
| 1193: | 11 | 16 | 7 | 4 | 6 | 7 | 9 | 8 |
| 1201: | 9 | 8 | 7 | 3 | 8 | 7 | 12 | 8 |
| 1209: | 7 | 7 | 7 | 7 | 10 | 7 | 16 | 4 |
| 1217: | 6 | 7 | 4 | 6 | 8 | 10 | 6 | 10 |
| 1225: | 7 | 8 | 12 | 5 | 8 | 10 | 3 | 9 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 9 | 8 | 12 | 12 | 16 | 17 | 13 | 5 |

Sample Title: HTC-A03-S002-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 11 | 7 | 7 | 3 | 10 | 9 | 9 | 10 |
| 1249: | 9 | 8 | 9 | 6 | 6 | 8 | 7 | 3 |
| 1257: | 10 | 6 | 9 | 8 | 6 | 7 | 5 | 3 |
| 1265: | 2 | 4 | 10 | 3 | 6 | 6 | 7 | 8 |
| 1273: | 7 | 5 | 8 | 7 | 0 | 4 | 5 | 9 |
| 1281: | 8 | 2 | 5 | 8 | 7 | 8 | 1 | 5 |
| 1289: | 5 | 6 | 6 | 9 | 7 | 5 | 2 | 4 |
| 1297: | 6 | 3 | 3 | 3 | 1 | 6 | 4 | 3 |
| 1305: | 7 | 4 | 5 | 4 | 9 | 5 | 5 | 10 |
| 1313: | 1 | 4 | 3 | 8 | 5 | 5 | 2 | 9 |
| 1321: | 1 | 3 | 3 | 4 | 5 | 5 | 2 | 4 |
| 1329: | 9 | 3 | 3 | 4 | 3 | 3 | 4 | 2 |
| 1337: | 3 | 4 | 3 | 3 | 2 | 4 | 7 | 3 |
| 1345: | 5 | 3 | 2 | 1 | 0 | 7 | 5 | 2 |
| 1353: | 2 | 3 | 3 | 4 | 5 | 2 | 4 | 1 |
| 1361: | 0 | 4 | 3 | 1 | 4 | 3 | 7 | 3 |
| 1369: | 2 | 2 | 3 | 5 | 0 | 6 | 4 | 5 |
| 1377: | 10 | 12 | 3 | 3 | 3 | 2 | 5 | 3 |
| 1385: | 5 | 2 | 1 | 8 | 1 | 3 | 2 | 3 |
| 1393: | 3 | 4 | 2 | 3 | 4 | 1 | 5 | 3 |
| 1401: | 5 | 6 | 2 | 2 | 5 | 2 | 6 | 8 |
| 1409: | 8 | 4 | 2 | 2 | 4 | 5 | 1 | 4 |
| 1417: | 5 | 0 | 1 | 4 | 3 | 6 | 3 | 2 |
| 1425: | 1 | 5 | 2 | 3 | 0 | 0 | 3 | 1 |
| 1433: | 5 | 5 | 1 | 1 | 5 | 1 | 2 | 0 |
| 1441: | 0 | 0 | 5 | 3 | 3 | 2 | 4 | 4 |
| 1449: | 4 | 2 | 1 | 4 | 3 | 1 | 0 | 0 |
| 1457: | 7 | 12 | 86 | 255 | 317 | 122 | 19 | 15 |
| 1465: | 10 | 7 | 6 | 3 | 0 | 1 | 4 | 3 |
| 1473: | 0 | 1 | 2 | 4 | 2 | 3 | 0 | 6 |
| 1481: | 2 | 2 | 4 | 2 | 2 | 0 | 2 | 1 |
| 1489: | 2 | 1 | 2 | 0 | 1 | 3 | 3 | 2 |
| 1497: | 1 | 2 | 2 | 1 | 4 | 3 | 2 | 2 |
| 1505: | 2 | 0 | 1 | 3 | 5 | 4 | 0 | 4 |
| 1513: | 2 | 3 | 2 | 1 | 1 | 3 | 1 | 1 |
| 1521: | 1 | 5 | 1 | 0 | 5 | 1 | 0 | 1 |
| 1529: | 4 | 0 | 2 | 3 | 0 | 2 | 1 | 2 |
| 1537: | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 6 |
| 1545: | 1 | 2 | 2 | 1 | 1 | 1 | 3 | 2 |
| 1553: | 1 | 3 | 1 | 1 | 1 | 0 | 2 | 0 |
| 1561: | 0 | 1 | 0 | 2 | 2 | 1 | 3 | 0 |
| 1569: | 2 | 1 | 2 | 2 | 2 | 0 | 1 | 2 |
| 1577: | 2 | 2 | 0 | 5 | 2 | 1 | 4 | 1 |
| 1585: | 1 | 1 | 4 | 5 | 8 | 3 | 2 | 5 |
| 1593: | 3 | 2 | 1 | 0 | 2 | 1 | 1 | 2 |
| 1601: | 0 | 1 | 3 | 2 | 0 | 2 | 2 | 1 |
| 1609: | 1 | 0 | 1 | 1 | 0 | 2 | 2 | 1 |
| 1617: | 0 | 2 | 3 | 5 | 3 | 1 | 2 | 1 |
| 1625: | 0 | 0 | 2 | 0 | 0 | 1 | 4 | 3 |
| 1633: | 4 | 3 | 1 | 4 | 2 | 2 | 1 | 3 |
| 1641: | 0 | 1 | 1 | 0 | 0 | 3 | 2 | 1 |
| 1649: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1657: | 3 | 0 | 3 | 2 | 1 | 2 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 3 | 1 | 1 | 0 | 3 | 0 | 3 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 0 |
| 1681: | 1 | 4 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1689: | 1 | 1 | 1 | 3 | 3 | 3 | 1 | 1 |
| 1697: | 2 | 0 | 1 | 1 | 1 | 0 | 2 | 0 |
| 1705: | 2 | 2 | 1 | 1 | 3 | 0 | 1 | 1 |
| 1713: | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 |
| 1721: | 0 | 0 | 2 | 1 | 1 | 1 | 2 | 2 |
| 1729: | 6 | 4 | 2 | 5 | 1 | 1 | 0 | 1 |
| 1737: | 1 | 1 | 1 | 0 | 3 | 1 | 3 | 3 |
| 1745: | 1 | 1 | 1 | 0 | 2 | 2 | 0 | 1 |
| 1753: | 0 | 2 | 0 | 0 | 1 | 2 | 1 | 2 |
| 1761: | 0 | 5 | 13 | 27 | 16 | 3 | 2 | 2 |
| 1769: | 5 | 0 | 2 | 0 | 2 | 2 | 0 | 3 |
| 1777: | 2 | 0 | 0 | 0 | 2 | 1 | 1 | 2 |
| 1785: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 2 |
| 1793: | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1801: | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 0 |
| 1809: | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 1817: | 0 | 2 | 0 | 1 | 1 | 1 | 2 | 0 |
| 1825: | 0 | 1 | 0 | 2 | 0 | 1 | 1 | 0 |
| 1833: | 0 | 3 | 0 | 0 | 2 | 0 | 1 | 1 |
| 1841: | 0 | 0 | 1 | 4 | 2 | 6 | 6 | 3 |
| 1849: | 3 | 0 | 1 | 0 | 0 | 2 | 1 | 1 |
| 1857: | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 1865: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 |
| 1873: | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| 1881: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 1889: | 1 | 3 | 2 | 1 | 1 | 1 | 2 | 3 |
| 1897: | 2 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| 1905: | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 1913: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1921: | 0 | 4 | 1 | 0 | 2 | 2 | 1 | 2 |
| 1929: | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 1 |
| 1937: | 1 | 3 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1945: | 1 | 0 | 2 | 1 | 0 | 1 | 0 | 1 |
| 1953: | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 1961: | 1 | 1 | 0 | 0 | 3 | 2 | 3 | 1 |
| 1969: | 0 | 0 | 1 | 1 | 3 | 0 | 2 | 2 |
| 1977: | 1 | 2 | 1 | 0 | 1 | 0 | 2 | 1 |
| 1985: | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 0 |
| 1993: | 1 | 0 | 2 | 2 | 0 | 3 | 2 | 1 |
| 2001: | 0 | 1 | 0 | 3 | 2 | 1 | 3 | 1 |
| 2009: | 1 | 1 | 1 | 0 | 2 | 0 | 2 | 3 |
| 2017: | 2 | 2 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2025: | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 1 |
| 2033: | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 0 |
| 2041: | 1 | 2 | 2 | 1 | 0 | 2 | 0 | 2 |
| 2049: | 1 | 2 | 1 | 1 | 0 | 1 | 1 | 4 |
| 2057: | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2065: | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2073: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2081: | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 |
| 2089: | 2 | 0 | 1 | 1 | 0 | 1 | 0 | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 2 | 2 | 4 | 1 | 4 | 1 | 4 | 5 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 2 | 2 | 2 | 0 | 0 | 1 | 0 | 0 |
| 2113: | 0 | 1 | 0 | 0 | 1 | 4 | 1 | 1 |
| 2121: | 0 | 1 | 0 | 2 | 1 | 1 | 1 | 2 |
| 2129: | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 2137: | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2145: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2153: | 3 | 0 | 1 | 0 | 1 | 2 | 1 | 2 |
| 2161: | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 |
| 2169: | 2 | 0 | 2 | 1 | 1 | 2 | 1 | 0 |
| 2177: | 1 | 2 | 3 | 1 | 0 | 0 | 2 | 1 |
| 2185: | 1 | 2 | 2 | 2 | 0 | 1 | 3 | 1 |
| 2193: | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 1 |
| 2201: | 2 | 8 | 8 | 7 | 3 | 2 | 1 | 3 |
| 2209: | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 0 |
| 2217: | 1 | 1 | 2 | 0 | 0 | 1 | 4 | 2 |
| 2225: | 1 | 1 | 0 | 1 | 1 | 0 | 2 | 0 |
| 2233: | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 3 |
| 2241: | 1 | 1 | 0 | 0 | 0 | 2 | 4 | 0 |
| 2249: | 0 | 4 | 0 | 2 | 2 | 1 | 1 | 2 |
| 2257: | 0 | 0 | 3 | 2 | 2 | 0 | 1 | 1 |
| 2265: | 1 | 1 | 2 | 4 | 1 | 1 | 2 | 2 |
| 2273: | 2 | 1 | 0 | 0 | 0 | 0 | 4 | 1 |
| 2281: | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2289: | 0 | 1 | 0 | 1 | 2 | 1 | 2 | 0 |
| 2297: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2305: | 0 | 0 | 3 | 1 | 3 | 1 | 0 | 0 |
| 2313: | 0 | 3 | 1 | 1 | 1 | 4 | 0 | 1 |
| 2321: | 0 | 0 | 1 | 0 | 1 | 2 | 3 | 1 |
| 2329: | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2337: | 0 | 0 | 0 | 1 | 4 | 1 | 3 | 1 |
| 2345: | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 0 |
| 2353: | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 0 |
| 2361: | 0 | 0 | 1 | 3 | 0 | 1 | 0 | 1 |
| 2369: | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 2 |
| 2377: | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 2 |
| 2385: | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2393: | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 1 |
| 2401: | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 1 |
| 2409: | 1 | 1 | 0 | 0 | 0 | 1 | 3 | 1 |
| 2417: | 0 | 3 | 1 | 0 | 0 | 2 | 0 | 0 |
| 2425: | 0 | 1 | 2 | 0 | 1 | 3 | 2 | 0 |
| 2433: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2441: | 2 | 0 | 1 | 1 | 3 | 3 | 3 | 4 |
| 2449: | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2457: | 0 | 2 | 0 | 0 | 2 | 1 | 2 | 0 |
| 2465: | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2473: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 2481: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2489: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2505: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2513: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2521: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2545: | 3 | 1 | 0 | 2 | 0 | 0 | 0 | 1 |
| 2553: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2561: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |
| 2569: | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2577: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2585: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2593: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 2601: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2609: | 0 | 2 | 5 | 14 | 25 | 27 | 11 | 4 |
| 2617: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2625: | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 |
| 2633: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2649: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2665: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2673: | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 2689: | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 1 |
| 2697: | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2713: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 2721: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2737: | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 2745: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2753: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2761: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 2793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2801: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| 2809: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2817: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2825: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2833: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2841: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 2849: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2865: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2873: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 2881: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2889: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2905: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 2913: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2929: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 2985: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2993: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 |
| 3009: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3017: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3025: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3049: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3065: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3081: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3129: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3145: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3153: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3185: | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 2 |
| 3193: | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3249: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3257: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3289: | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 3297: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 3305: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3313: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-0006-01

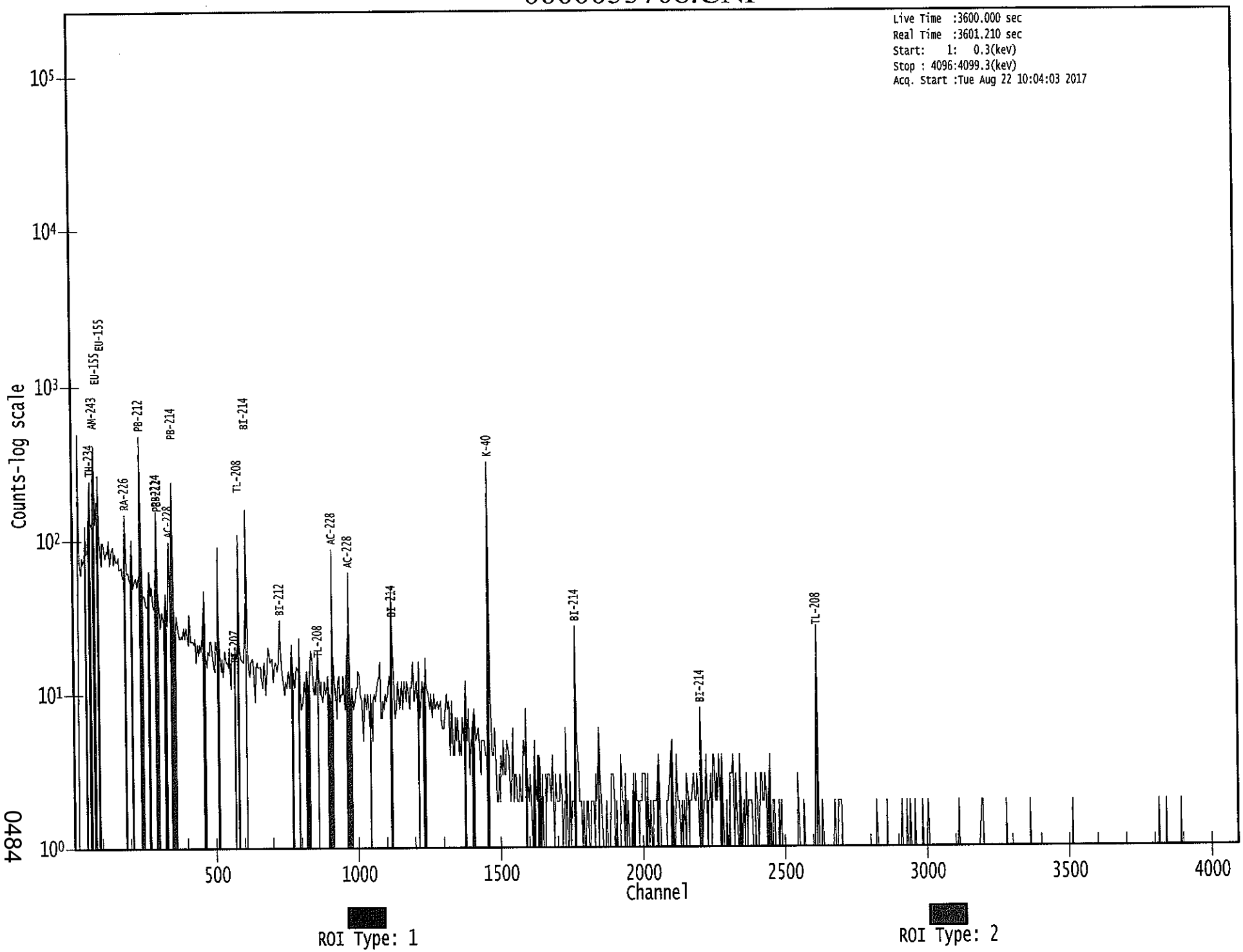
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3409: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3417: | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3473: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 |
| 3513: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3569: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3585: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3625: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3689: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3697: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3713: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3745: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3753: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3761: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3777: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3841: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 3865: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3905: | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4001: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4025: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |

# 0000055708.CNF




0484

Apex-Gamma

8/22

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-05 |
| Sample Description | : HTC-A03-S002-0612-01 |
| Sample Type | : SOIL |
| Sample Size | : 8.268E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:41:59AM |
| Acquisition Started | : 8/22/2017 9:01:25AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE2 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3600.9 seconds |
| Dead Time | : 0.02 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 28 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 8/19/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55705 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 10:01:44AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 76.09 | 76.40 | 0.0000 | 0.00 |
| 2 | 87.17 | 87.47 | 0.0000 | 0.00 |
| 3 | 92.83 | 93.12 | 0.0000 | 0.00 |
| 4 | 185.82 | 186.01 | 0.0000 | 0.00 |
| 5 | 239.06 | 239.20 | 0.0000 | 0.00 |
| 6 | 295.26 | 295.34 | 0.0000 | 0.00 |
| 7 | 338.53 | 338.56 | 0.0000 | 0.00 |
| 8 | 351.80 | 351.82 | 0.0000 | 0.00 |
| 9 | 372.43 | 372.43 | 0.0000 | 0.00 |
| 10 | 510.91 | 510.77 | 0.0000 | 0.00 |
| 11 | 583.50 | 583.28 | 0.0000 | 0.00 |
| 12 | 609.35 | 609.11 | 0.0000 | 0.00 |
| 13 | 726.74 | 726.38 | 0.0000 | 0.00 |
| 14 | 733.42 | 733.06 | 0.0000 | 0.00 |
| 15 | 768.45 | 768.05 | 0.0000 | 0.00 |
| 16 | 772.39 | 771.99 | 0.0000 | 0.00 |
| 17 | 860.88 | 860.39 | 0.0000 | 0.00 |
| 18 | 911.42 | 910.88 | 0.0000 | 0.00 |
| 19 | 967.83 | 967.24 | 0.0000 | 0.00 |
| 20 | 1092.17 | 1091.46 | 0.0000 | 0.00 |
| 21 | 1116.03 | 1115.30 | 0.0000 | 0.00 |
| 22 | 1120.06 | 1119.33 | 0.0000 | 0.00 |
| 23 | 1377.36 | 1376.41 | 0.0000 | 0.00 |
| 24 | 1432.80 | 1431.80 | 0.0000 | 0.00 |
| 25 | 1460.99 | 1459.96 | 0.0000 | 0.00 |
| 26 | 1511.87 | 1510.80 | 0.0000 | 0.00 |
| 27 | 1553.60 | 1552.50 | 0.0000 | 0.00 |
| 28 | 1563.90 | 1562.79 | 0.0000 | 0.00 |
| 29 | 1660.44 | 1659.25 | 0.0000 | 0.00 |
| 30 | 1729.92 | 1728.68 | 0.0000 | 0.00 |
| 31 | 1764.59 | 1763.32 | 0.0000 | 0.00 |
| 32 | 1771.19 | 1769.92 | 0.0000 | 0.00 |
| 33 | 2103.90 | 2102.38 | 0.0000 | 0.00 |
| 34 | 2203.81 | 2202.22 | 0.0000 | 0.00 |
| 35 | 2614.55 | 2612.69 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 10:01:44AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 76.09 | 72 - | 83 | 76.40 | 5.03E+02 | 137.58 | 2.11E+03 | 3.44 |
| | 2 | 87.17 | 86 - | 89 | 87.47 | 6.67E+01 | 53.37 | 6.49E+02 | 1.63 |
| | 3 | 92.83 | 91 - | 95 | 93.12 | 1.05E+02 | 62.45 | 7.62E+02 | 1.20 |
| | 4 | 185.82 | 183 - | 188 | 186.01 | 9.16E+01 | 55.52 | 5.39E+02 | 1.32 |
| | 5 | 239.06 | 234 - | 243 | 239.20 | 4.93E+02 | 85.20 | 7.55E+02 | 1.47 |
| | 6 | 295.26 | 293 - | 298 | 295.34 | 1.65E+02 | 44.92 | 2.75E+02 | 1.83 |
| | 7 | 338.53 | 335 - | 342 | 338.56 | 8.17E+01 | 45.30 | 2.79E+02 | 1.91 |
| | 8 | 351.80 | 347 - | 356 | 351.82 | 3.35E+02 | 61.29 | 3.45E+02 | 1.47 |
| | 9 | 372.43 | 370 - | 375 | 372.43 | 2.92E+01 | 26.51 | 1.18E+02 | 3.48 |
| | 10 | 510.91 | 505 - | 517 | 510.77 | 1.48E+02 | 49.68 | 2.20E+02 | 2.78 |
| | 11 | 583.50 | 579 - | 587 | 583.28 | 1.48E+02 | 37.56 | 1.25E+02 | 2.22 |
| | 12 | 609.35 | 605 - | 613 | 609.11 | 2.28E+02 | 44.33 | 1.63E+02 | 1.73 |
| M | 13 | 726.74 | 722 - | 735 | 726.38 | 3.42E+01 | 21.14 | 4.79E+01 | 2.18 |
| m | 14 | 733.42 | 722 - | 735 | 733.06 | 2.38E+01 | 13.96 | 1.40E+01 | 2.18 |
| M | 15 | 768.45 | 762 - | 775 | 768.05 | 3.26E+01 | 21.54 | 5.97E+01 | 2.02 |
| m | 16 | 772.39 | 762 - | 775 | 771.99 | 1.47E+01 | 19.60 | 6.39E+01 | 2.03 |
| | 17 | 860.88 | 855 - | 865 | 860.39 | 2.65E+01 | 26.72 | 7.70E+01 | 2.13 |
| | 18 | 911.42 | 907 - | 914 | 910.88 | 8.70E+01 | 29.93 | 8.99E+01 | 1.40 |
| | 19 | 967.83 | 961 - | 973 | 967.24 | 9.80E+01 | 36.47 | 1.10E+02 | 2.27 |
| | 20 | 1092.17 | 1086 - | 1097 | 1091.46 | 2.76E+01 | 25.30 | 6.67E+01 | 9.26 |
| M | 21 | 1116.03 | 1113 - | 1122 | 1115.30 | 1.39E+01 | 14.76 | 3.97E+01 | 2.49 |
| m | 22 | 1120.06 | 1113 - | 1122 | 1119.33 | 5.72E+01 | 21.70 | 6.85E+01 | 2.53 |
| | 23 | 1377.36 | 1373 - | 1379 | 1376.41 | 1.24E+01 | 14.91 | 3.11E+01 | 2.61 |
| | 24 | 1432.80 | 1429 - | 1434 | 1431.80 | 9.00E+00 | 9.80 | 1.20E+01 | 1.67 |
| | 25 | 1460.99 | 1453 - | 1466 | 1459.96 | 4.53E+02 | 48.12 | 5.61E+01 | 2.33 |
| | 26 | 1511.87 | 1505 - | 1518 | 1510.80 | 1.90E+01 | 18.11 | 2.80E+01 | 7.59 |
| | 27 | 1553.60 | 1549 - | 1555 | 1552.50 | 1.00E+01 | 6.32 | 0.00E+00 | 2.36 |
| | 28 | 1563.90 | 1560 - | 1566 | 1562.79 | 9.00E+00 | 8.75 | 8.00E+00 | 3.75 |
| | 29 | 1660.44 | 1656 - | 1661 | 1659.25 | 7.00E+00 | 7.62 | 6.00E+00 | 1.49 |
| | 30 | 1729.92 | 1724 - | 1731 | 1728.68 | 1.19E+01 | 10.95 | 1.23E+01 | 2.83 |
| | 31 | 1764.59 | 1760 - | 1768 | 1763.32 | 4.65E+01 | 18.47 | 2.70E+01 | 2.44 |
| | 32 | 1771.19 | 1768 - | 1773 | 1769.92 | 7.11E+00 | 7.35 | 3.78E+00 | 0.99 |
| | 33 | 2103.90 | 2098 - | 2105 | 2102.38 | 8.00E+00 | 5.66 | 0.00E+00 | 2.98 |
| | 34 | 2203.81 | 2197 - | 2208 | 2202.22 | 1.27E+01 | 14.00 | 1.85E+01 | 4.50 |
| | 35 | 2614.55 | 2608 - | 2617 | 2612.69 | 5.10E+01 | 14.28 | 0.00E+00 | 2.94 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 10:01:44AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 76.09 | 72 - | 83 | 5.03E+02 | 137.58 | 2.11E+03 | 1.32E+02 |
| | 2 | 87.17 | 86 - | 89 | 6.67E+01 | 53.37 | 6.49E+02 | 4.18E+01 |
| | 3 | 92.83 | 91 - | 95 | 1.05E+02 | 62.45 | 7.62E+02 | 4.85E+01 |
| | 4 | 185.82 | 183 - | 188 | 9.16E+01 | 55.52 | 5.39E+02 | 4.28E+01 |
| | 5 | 239.06 | 234 - | 243 | 4.93E+02 | 85.20 | 7.55E+02 | 5.98E+01 |
| | 6 | 295.26 | 293 - | 298 | 1.65E+02 | 44.92 | 2.75E+02 | 3.03E+01 |
| | 7 | 338.53 | 335 - | 342 | 8.17E+01 | 45.30 | 2.79E+02 | 3.41E+01 |
| | 8 | 351.80 | 347 - | 356 | 3.35E+02 | 61.29 | 3.45E+02 | 1.92E+01 |
| | 9 | 372.43 | 370 - | 375 | 2.92E+01 | 26.51 | 1.18E+02 | 1.99E+01 |
| | 10 | 510.91 | 505 - | 517 | 1.48E+02 | 49.68 | 2.20E+02 | 3.56E+01 |
| | 11 | 583.50 | 579 - | 587 | 1.48E+02 | 37.56 | 1.25E+02 | 2.35E+01 |
| | 12 | 609.35 | 605 - | 613 | 2.28E+02 | 44.33 | 1.63E+02 | 2.67E+01 |
| M | 13 | 726.74 | 722 - | 735 | 3.42E+01 | 21.14 | 4.79E+01 | 1.14E+01 |
| m | 14 | 733.42 | 722 - | 735 | 2.38E+01 | 13.96 | 1.40E+01 | 6.16E+00 |
| M | 15 | 768.45 | 762 - | 775 | 3.26E+01 | 21.54 | 5.97E+01 | 1.27E+01 |
| m | 16 | 772.39 | 762 - | 775 | 1.47E+01 | 19.60 | 6.39E+01 | 1.31E+01 |
| | 17 | 860.88 | 855 - | 865 | 2.65E+01 | 26.72 | 7.70E+01 | 2.03E+01 |
| | 18 | 911.42 | 907 - | 914 | 8.70E+01 | 29.93 | 8.99E+01 | 1.92E+01 |
| | 19 | 967.83 | 961 - | 973 | 9.80E+01 | 36.47 | 1.10E+02 | 2.52E+01 |
| | 20 | 1092.17 | 1086 - | 1097 | 2.76E+01 | 25.30 | 6.67E+01 | 1.89E+01 |
| M | 21 | 1116.03 | 1113 - | 1122 | 1.39E+01 | 14.76 | 3.97E+01 | 1.04E+01 |
| m | 22 | 1120.06 | 1113 - | 1122 | 5.72E+01 | 21.70 | 6.85E+01 | 1.36E+01 |
| | 23 | 1377.36 | 1373 - | 1379 | 1.24E+01 | 14.91 | 3.11E+01 | 1.08E+01 |
| | 24 | 1432.80 | 1429 - | 1434 | 9.00E+00 | 9.80 | 1.20E+01 | 6.37E+00 |
| | 25 | 1460.99 | 1453 - | 1466 | 4.53E+02 | 48.12 | 5.61E+01 | 1.85E+01 |
| | 26 | 1511.87 | 1505 - | 1518 | 1.90E+01 | 18.11 | 2.80E+01 | 1.30E+01 |
| | 27 | 1553.60 | 1549 - | 1555 | 1.00E+01 | 6.32 | 0.00E+00 | 0.00E+00 |
| | 28 | 1563.90 | 1560 - | 1566 | 9.00E+00 | 8.75 | 8.00E+00 | 5.23E+00 |
| | 29 | 1660.44 | 1656 - | 1661 | 7.00E+00 | 7.62 | 6.00E+00 | 4.50E+00 |
| | 30 | 1729.92 | 1724 - | 1731 | 1.19E+01 | 10.95 | 1.23E+01 | 7.00E+00 |
| | 31 | 1764.59 | 1760 - | 1768 | 4.65E+01 | 18.47 | 2.70E+01 | 1.02E+01 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 32 | 1771.19 | 1768 - | 1773 | 7.11E+00 | 7.35 | 3.78E+00 | 4.16E+00 |
| 33 | 2103.90 | 2098 - | 2105 | 8.00E+00 | 5.66 | 0.00E+00 | 0.00E+00 |
| 34 | 2203.81 | 2197 - | 2208 | 1.27E+01 | 14.00 | 1.85E+01 | 9.90E+00 |
| 35 | 2614.55 | 2608 - | 2617 | 5.10E+01 | 14.28 | 0.00E+00 | 0.00E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 10:01:44AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 76.09 | 72 - | 83 | 76.40 | 5.03E+02 | 137.58 | 2.11E+03 | ..... |
| | 2 | 87.17 | 86 - | 89 | 87.47 | 6.67E+01 | 53.37 | 6.49E+02 | SN-126 |
| | | | | | | | | | NP-237 |
| | | | | | | | | | EU-155 |
| | | | | | | | | | CD-109 |
| | 3 | 92.83 | 91 - | 95 | 93.12 | 1.05E+02 | 62.45 | 7.62E+02 | GA-67 |
| | 4 | 185.82 | 183 - | 188 | 186.01 | 9.16E+01 | 55.52 | 5.39E+02 | RA-226 |
| | 5 | 239.06 | 234 - | 243 | 239.20 | 4.93E+02 | 85.20 | 7.55E+02 | PB-212 |
| | 6 | 295.26 | 293 - | 298 | 295.34 | 1.65E+02 | 44.92 | 2.75E+02 | PB-214 |
| | 7 | 338.53 | 335 - | 342 | 338.56 | 8.17E+01 | 45.30 | 2.79E+02 | AC-228 |
| | 8 | 351.80 | 347 - | 356 | 351.82 | 3.35E+02 | 61.29 | 3.45E+02 | PB-214 |
| | 9 | 372.43 | 370 - | 375 | 372.43 | 2.92E+01 | 26.51 | 1.18E+02 | ..... |
| | 10 | 510.91 | 505 - | 517 | 510.77 | 1.48E+02 | 49.68 | 2.20E+02 | ..... |
| | 11 | 583.50 | 579 - | 587 | 583.28 | 1.48E+02 | 37.56 | 1.25E+02 | TL-208 |
| | 12 | 609.35 | 605 - | 613 | 609.11 | 2.28E+02 | 44.33 | 1.63E+02 | BI-214 |
| M | 13 | 726.74 | 722 - | 735 | 726.38 | 3.42E+01 | 21.14 | 4.79E+01 | BI-212 |
| m | 14 | 733.42 | 722 - | 735 | 733.06 | 2.38E+01 | 13.96 | 1.40E+01 | PA-234 |
| M | 15 | 768.45 | 762 - | 775 | 768.05 | 3.26E+01 | 21.54 | 5.97E+01 | ..... |
| m | 16 | 772.39 | 762 - | 775 | 771.99 | 1.47E+01 | 19.60 | 6.39E+01 | ..... |
| | 17 | 860.88 | 855 - | 865 | 860.39 | 2.65E+01 | 26.72 | 7.70E+01 | TL-208 |
| | 18 | 911.42 | 907 - | 914 | 910.88 | 8.70E+01 | 29.93 | 8.99E+01 | TL-204 |
| | | | | | | | | | AC-228 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 19 | 967.83 | 961 - | 973 | 967.24 | 9.80E+01 | 36.47 | 1.10E+02 | ..... |
| | 20 | 1092.17 | 1086 - | 1097 | 1091.46 | 2.76E+01 | 25.30 | 6.67E+01 | ..... |
| M | 21 | 1116.03 | 1113 - | 1122 | 1115.30 | 1.39E+01 | 14.76 | 3.97E+01 | ZN-65 |
| m | 22 | 1120.06 | 1113 - | 1122 | 1119.33 | 5.72E+01 | 21.70 | 6.85E+01 | BI-214<br>SC-46 |
| | 23 | 1377.36 | 1373 - | 1379 | 1376.41 | 1.24E+01 | 14.91 | 3.11E+01 | ..... |
| | 24 | 1432.80 | 1429 - | 1434 | 1431.80 | 9.00E+00 | 9.80 | 1.20E+01 | ..... |
| | 25 | 1460.99 | 1453 - | 1466 | 1459.96 | 4.53E+02 | 48.12 | 5.61E+01 | K-40 |
| | 26 | 1511.87 | 1505 - | 1518 | 1510.80 | 1.90E+01 | 18.11 | 2.80E+01 | ..... |
| | 27 | 1553.60 | 1549 - | 1555 | 1552.50 | 1.00E+01 | 6.32 | 0.00E+00 | ..... |
| | 28 | 1563.90 | 1560 - | 1566 | 1562.79 | 9.00E+00 | 8.75 | 8.00E+00 | ..... |
| | 29 | 1660.44 | 1656 - | 1661 | 1659.25 | 7.00E+00 | 7.62 | 6.00E+00 | ..... |
| | 30 | 1729.92 | 1724 - | 1731 | 1728.68 | 1.19E+01 | 10.95 | 1.23E+01 | ..... |
| | 31 | 1764.59 | 1760 - | 1768 | 1763.32 | 4.65E+01 | 18.47 | 2.70E+01 | BI-214 |
| | 32 | 1771.19 | 1768 - | 1773 | 1769.92 | 7.11E+00 | 7.35 | 3.78E+00 | CO-56 |
| | 33 | 2103.90 | 2098 - | 2105 | 2102.38 | 8.00E+00 | 5.66 | 0.00E+00 | ..... |
| | 34 | 2203.81 | 2197 - | 2208 | 2202.22 | 1.27E+01 | 14.00 | 1.85E+01 | BI-214 |
| | 35 | 2614.55 | 2608 - | 2617 | 2612.69 | 5.10E+01 | 14.28 | 0.00E+00 | TL-208 |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 10:01:44AM

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 1 | 76.09 | 5.03E+02 | 137.58 | 2.63E-02 | 2.11E-03 |
| 2 | 87.17 | 6.67E+01 | 53.37 | 2.70E-02 | 2.40E-03 |
| 3 | 92.83 | 1.05E+02 | 62.45 | 2.70E-02 | 2.33E-03 |
| 4 | 185.82 | 9.16E+01 | 55.52 | 2.03E-02 | 1.53E-03 |
| 5 | 239.06 | 4.93E+02 | 85.20 | 1.72E-02 | 1.30E-03 |
| 6 | 295.26 | 1.65E+02 | 44.92 | 1.48E-02 | 1.10E-03 |
| 7 | 338.53 | 8.17E+01 | 45.30 | 1.34E-02 | 1.04E-03 |
| 8 | 351.80 | 3.35E+02 | 61.29 | 1.31E-02 | 1.02E-03 |
| 9 | 372.43 | 2.92E+01 | 26.51 | 1.25E-02 | 9.94E-04 |
| 10 | 510.91 | 1.48E+02 | 49.68 | 9.87E-03 | 8.65E-04 |
| 11 | 583.50 | 1.48E+02 | 37.56 | 8.90E-03 | 8.02E-04 |
| 12 | 609.35 | 2.28E+02 | 44.33 | 8.60E-03 | 7.80E-04 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| M | 13 | 726.74 | 3.42E+01 | 21.14 | 7.47E-03 | 6.71E-04 |
| m | 14 | 733.42 | 2.38E+01 | 13.96 | 7.42E-03 | 6.65E-04 |
| M | 15 | 768.45 | 3.26E+01 | 21.54 | 7.14E-03 | 6.31E-04 |
| m | 16 | 772.39 | 1.47E+01 | 19.60 | 7.11E-03 | 6.27E-04 |
| | 17 | 860.88 | 2.65E+01 | 26.72 | 6.51E-03 | 5.42E-04 |
| | 18 | 911.42 | 8.70E+01 | 29.93 | 6.21E-03 | 5.01E-04 |
| | 19 | 967.83 | 9.80E+01 | 36.47 | 5.91E-03 | 4.82E-04 |
| | 20 | 1092.17 | 2.76E+01 | 25.30 | 5.35E-03 | 4.38E-04 |
| M | 21 | 1116.03 | 1.39E+01 | 14.76 | 5.26E-03 | 4.30E-04 |
| m | 22 | 1120.06 | 5.72E+01 | 21.70 | 5.24E-03 | 4.29E-04 |
| | 23 | 1377.36 | 1.24E+01 | 14.91 | 4.46E-03 | 4.12E-04 |
| | 24 | 1432.80 | 9.00E+00 | 9.80 | 4.32E-03 | 3.96E-04 |
| | 25 | 1460.99 | 4.53E+02 | 48.12 | 4.26E-03 | 3.88E-04 |
| | 26 | 1511.87 | 1.90E+01 | 18.11 | 4.16E-03 | 3.73E-04 |
| | 27 | 1553.60 | 1.00E+01 | 6.32 | 4.08E-03 | 3.61E-04 |
| | 28 | 1563.90 | 9.00E+00 | 8.75 | 4.06E-03 | 3.58E-04 |
| | 29 | 1660.44 | 7.00E+00 | 7.62 | 3.90E-03 | 3.30E-04 |
| | 30 | 1729.92 | 1.19E+01 | 10.95 | 3.79E-03 | 3.10E-04 |
| | 31 | 1764.59 | 4.65E+01 | 18.47 | 3.75E-03 | 3.00E-04 |
| | 32 | 1771.19 | 7.11E+00 | 7.35 | 3.74E-03 | 2.98E-04 |
| | 33 | 2103.90 | 8.00E+00 | 5.66 | 3.41E-03 | 2.79E-04 |
| | 34 | 2203.81 | 1.27E+01 | 14.00 | 3.34E-03 | 2.79E-04 |
| | 35 | 2614.55 | 5.10E+01 | 14.28 | 3.20E-03 | 2.79E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 10:01:44AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055574.CNF

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|
| 1 | 76.09 | 5.03E+02 | 137.58 | | | 5.03E+02 | 1.38E+02 |
| 2 | 87.17 | 6.67E+01 | 53.37 | | | 6.67E+01 | 5.34E+01 |
| 3 | 92.83 | 1.05E+02 | 62.45 | 4.88E+01 | 1.30E+00 | 5.60E+01 | 6.25E+01 |
| 4 | 185.82 | 9.16E+01 | 55.52 | 3.48E+01 | 7.32E+00 | 5.68E+01 | 5.60E+01 |
| 5 | 239.06 | 4.93E+02 | 85.20 | 7.09E+00 | 6.85E+00 | 4.86E+02 | 8.55E+01 |
| 6 | 295.26 | 1.65E+02 | 44.92 | | | 1.65E+02 | 4.49E+01 |
| 7 | 338.53 | 8.17E+01 | 45.30 | | | 8.17E+01 | 4.53E+01 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 8 | 351.80 | 3.35E+02 | 61.29 | 1.04E+01 | 5.08E+00 | 3.25E+02 | 6.15E+01 |
| | 9 | 372.43 | 2.92E+01 | 26.51 | | | 2.92E+01 | 2.65E+01 |
| | 10 | 510.91 | 1.48E+02 | 49.68 | 7.08E+01 | 4.94E+00 | 7.74E+01 | 4.99E+01 |
| | 11 | 583.50 | 1.48E+02 | 37.56 | 5.65E+00 | 3.57E+00 | 1.43E+02 | 3.77E+01 |
| | 12 | 609.35 | 2.28E+02 | 44.33 | 1.07E+01 | 3.96E+00 | 2.17E+02 | 4.45E+01 |
| M | 13 | 726.74 | 3.42E+01 | 21.14 | | | 3.42E+01 | 2.11E+01 |
| m | 14 | 733.42 | 2.38E+01 | 13.96 | | | 2.38E+01 | 1.40E+01 |
| M | 15 | 768.45 | 3.26E+01 | 21.54 | | | 3.26E+01 | 2.15E+01 |
| m | 16 | 772.39 | 1.47E+01 | 19.60 | | | 1.47E+01 | 1.96E+01 |
| | 17 | 860.88 | 2.65E+01 | 26.72 | | | 2.65E+01 | 2.67E+01 |
| | 18 | 911.42 | 8.70E+01 | 29.93 | 2.63E+00 | 2.49E+00 | 8.44E+01 | 3.00E+01 |
| | 19 | 967.83 | 9.80E+01 | 36.47 | | | 9.80E+01 | 3.65E+01 |
| | 20 | 1092.17 | 2.76E+01 | 25.30 | | | 2.76E+01 | 2.53E+01 |
| M | 21 | 1116.03 | 1.39E+01 | 14.76 | | | 1.39E+01 | 1.48E+01 |
| m | 22 | 1120.06 | 5.72E+01 | 21.70 | 2.45E+00 | 2.38E+00 | 5.47E+01 | 2.18E+01 |
| | 23 | 1377.36 | 1.24E+01 | 14.91 | | | 1.24E+01 | 1.49E+01 |
| | 24 | 1432.80 | 9.00E+00 | 9.80 | | | 9.00E+00 | 9.80E+00 |
| | 25 | 1460.99 | 4.53E+02 | 48.12 | 5.90E+00 | 2.63E+00 | 4.47E+02 | 4.82E+01 |
| | 26 | 1511.87 | 1.90E+01 | 18.11 | | | 1.90E+01 | 1.81E+01 |
| | 27 | 1553.60 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| | 28 | 1563.90 | 9.00E+00 | 8.75 | | | 9.00E+00 | 8.75E+00 |
| | 29 | 1660.44 | 7.00E+00 | 7.62 | | | 7.00E+00 | 7.62E+00 |
| | 30 | 1729.92 | 1.19E+01 | 10.95 | | | 1.19E+01 | 1.10E+01 |
| | 31 | 1764.59 | 4.65E+01 | 18.47 | 3.33E+00 | 1.73E+00 | 4.32E+01 | 1.86E+01 |
| | 32 | 1771.19 | 7.11E+00 | 7.35 | | | 7.11E+00 | 7.35E+00 |
| | 33 | 2103.90 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 34 | 2203.81 | 1.27E+01 | 14.00 | | | 1.27E+01 | 1.40E+01 |
| | 35 | 2614.55 | 5.10E+01 | 14.28 | 4.77E+00 | 1.52E+00 | 4.62E+01 | 1.44E+01 |

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 10:01:44AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055574.CNF

Corrected Area is: Original * Peak Ratio - Background

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 76.09 | 5.03E+02 | 137.58 | | | 5.03E+02 | 1.38E+02 |
| | 2 | 87.17 | 6.67E+01 | 53.37 | | | 6.67E+01 | 5.34E+01 |
| | 3 | 92.83 | 1.05E+02 | 62.45 | 4.88E+01 | 1.30E+00 | 5.60E+01 | 6.25E+01 |
| | 4 | 185.82 | 9.16E+01 | 55.52 | 3.48E+01 | 7.32E+00 | 5.68E+01 | 5.60E+01 |
| | 5 | 239.06 | 4.93E+02 | 85.20 | 7.09E+00 | 6.85E+00 | 4.86E+02 | 8.55E+01 |
| | 6 | 295.26 | 1.65E+02 | 44.92 | | | 1.65E+02 | 4.49E+01 |
| | 7 | 338.53 | 8.17E+01 | 45.30 | | | 8.17E+01 | 4.53E+01 |
| | 8 | 351.80 | 3.35E+02 | 61.29 | 1.04E+01 | 5.08E+00 | 3.25E+02 | 6.15E+01 |
| | 9 | 372.43 | 2.92E+01 | 26.51 | | | 2.92E+01 | 2.65E+01 |
| | 10 | 510.91 | 1.48E+02 | 49.68 | 7.08E+01 | 4.94E+00 | 7.74E+01 | 4.99E+01 |
| | 11 | 583.50 | 1.48E+02 | 37.56 | 5.65E+00 | 3.57E+00 | 1.43E+02 | 3.77E+01 |
| | 12 | 609.35 | 2.28E+02 | 44.33 | 1.07E+01 | 3.96E+00 | 2.17E+02 | 4.45E+01 |
| M | 13 | 726.74 | 3.42E+01 | 21.14 | | | 3.42E+01 | 2.11E+01 |
| m | 14 | 733.42 | 2.38E+01 | 13.96 | | | 2.38E+01 | 1.40E+01 |
| M | 15 | 768.45 | 3.26E+01 | 21.54 | | | 3.26E+01 | 2.15E+01 |
| m | 16 | 772.39 | 1.47E+01 | 19.60 | | | 1.47E+01 | 1.96E+01 |
| | 17 | 860.88 | 2.65E+01 | 26.72 | | | 2.65E+01 | 2.67E+01 |
| | 18 | 911.42 | 8.70E+01 | 29.93 | 2.63E+00 | 2.49E+00 | 8.44E+01 | 3.00E+01 |
| | 19 | 967.83 | 9.80E+01 | 36.47 | | | 9.80E+01 | 3.65E+01 |
| | 20 | 1092.17 | 2.76E+01 | 25.30 | | | 2.76E+01 | 2.53E+01 |
| M | 21 | 1116.03 | 1.39E+01 | 14.76 | | | 1.39E+01 | 1.48E+01 |
| m | 22 | 1120.06 | 5.72E+01 | 21.70 | 2.45E+00 | 2.38E+00 | 5.47E+01 | 2.18E+01 |
| | 23 | 1377.36 | 1.24E+01 | 14.91 | | | 1.24E+01 | 1.49E+01 |
| | 24 | 1432.80 | 9.00E+00 | 9.80 | | | 9.00E+00 | 9.80E+00 |
| | 25 | 1460.99 | 4.53E+02 | 48.12 | 5.90E+00 | 2.63E+00 | 4.47E+02 | 4.82E+01 |
| | 26 | 1511.87 | 1.90E+01 | 18.11 | | | 1.90E+01 | 1.81E+01 |
| | 27 | 1553.60 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| | 28 | 1563.90 | 9.00E+00 | 8.75 | | | 9.00E+00 | 8.75E+00 |
| | 29 | 1660.44 | 7.00E+00 | 7.62 | | | 7.00E+00 | 7.62E+00 |
| | 30 | 1729.92 | 1.19E+01 | 10.95 | | | 1.19E+01 | 1.10E+01 |
| | 31 | 1764.59 | 4.65E+01 | 18.47 | 3.33E+00 | 1.73E+00 | 4.32E+01 | 1.86E+01 |
| | 32 | 1771.19 | 7.11E+00 | 7.35 | | | 7.11E+00 | 7.35E+00 |
| | 33 | 2103.90 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 34 | 2203.81 | 1.27E+01 | 14.00 | | | 1.27E+01 | 1.40E+01 |
| | 35 | 2614.55 | 5.10E+01 | 14.28 | 4.77E+00 | 1.52E+00 | 4.62E+01 | 1.44E+01 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.995 | 1460.81 | * | 10.67 | 8.93E+00 | 1.27E+00 |
| ZN-65 | 0.959 | 1115.52 | * | 50.75 | 6.24E-02 | 6.67E-02 |
| CD-109 | 0.888 | 88.03 | * | 3.72 | 7.00E-01 | 5.65E-01 |
| SN-126 | 0.975 | 87.57 | * | 37.00 | 6.07E-02 | 4.89E-02 |
| EU-155 | 0.319 | 86.50 | * | 30.90 | 7.55E-02 | 6.08E-02 |
| | | 105.30 | | 20.70 | | |
| TL-208 | 0.987 | 583.14 | * | 30.22 | 4.82E-01 | 1.35E-01 |
| | | 860.37 | * | 4.48 | 8.26E-01 | 8.35E-01 |
| | | 2614.66 | * | 35.85 | 3.66E-01 | 1.18E-01 |
| BI-212 | 0.744 | 727.17 | * | 11.80 | 3.52E-01 | 2.20E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.868 | 238.63 | * | 44.60 | 5.75E-01 | 1.10E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.996 | 609.31 | * | 46.30 | 4.95E-01 | 1.11E-01 |
| | | 1120.29 | * | 15.10 | 6.28E-01 | 2.56E-01 |
| | | 1764.49 | * | 15.80 | 6.62E-01 | 2.90E-01 |
| | | 2204.22 | * | 4.98 | 6.95E-01 | 7.66E-01 |
| PB-214 | 0.998 | 295.21 | * | 19.19 | 5.25E-01 | 1.48E-01 |
| | | 351.92 | * | 37.19 | 6.07E-01 | 1.24E-01 |
| RA-226 | 0.975 | 186.21 | * | 3.28 | 7.74E-01 | 1.61E+00 |
| AC-228 | 0.562 | 338.32 | * | 11.40 | 4.84E-01 | 2.71E-01 |
| | | 911.07 | * | 27.70 | 4.46E-01 | 1.63E-01 |
| | | 969.11 | | 16.60 | | |
| NP-237 | 0.931 | 86.50 | * | 12.60 | 1.78E-01 | 1.43E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 10:01:44AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 76.09 | 1.39583E-01 | 13.69 | | |
| | 3 | 92.83 | 1.55429E-02 | 55.82 | | |
| | 9 | 372.43 | 8.12027E-03 | 45.35 | Sum | |
| | 10 | 510.91 | 2.15115E-02 | 32.24 | | |
| m | 14 | 733.42 | 6.62015E-03 | 29.30 | Tol. | PA-234 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| M | 15 | 768.45 | 9.06770E-03 | 32.99 | Sum | |
| m | 16 | 772.39 | 4.08844E-03 | 66.57 | | |
| | 19 | 967.83 | 2.72177E-02 | 18.61 | | |
| | 20 | 1092.17 | 7.67532E-03 | 45.78 | | |
| | 23 | 1377.36 | 3.45734E-03 | 59.89 | | |
| | 24 | 1432.80 | 2.50000E-03 | 54.43 | | |
| | 26 | 1511.87 | 5.27778E-03 | 47.66 | | |
| | 27 | 1553.60 | 2.77778E-03 | 31.62 | | |
| | 28 | 1563.90 | 2.50000E-03 | 48.59 | | |
| | 29 | 1660.44 | 1.94444E-03 | 54.40 | | |
| | 30 | 1729.92 | 3.29475E-03 | 46.18 | Sum | |
| | 32 | 1771.19 | 1.97531E-03 | 51.67 | | |
| | 33 | 2103.90 | 2.22222E-03 | 35.36 | S-Esc | |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.99 | 1460.81 | * | 10.67 | 8.93E+00 | 1.27E+00 |
| ZN-65 | 0.95 | 1115.52 | * | 50.75 | 6.24E-02 | 6.67E-02 |
| CD-109 | 0.88 | 88.03 | * | 3.72 | 7.00E-01 | 5.65E-01 |
| SN-126 | 0.97 | 87.57 | * | 37.00 | 6.07E-02 | 4.89E-02 |
| EU-155 | 0.31 | 86.50 | * | 30.90 | 7.55E-02 | 6.08E-02 |
| | | 105.30 | | 20.70 | | |
| TL-208 | 0.98 | 583.14 | * | 30.22 | 4.82E-01 | 1.35E-01 |
| | | 860.37 | * | 4.48 | 8.26E-01 | 8.35E-01 |
| | | 2614.66 | * | 35.85 | 3.66E-01 | 1.18E-01 |
| BI-212 | 0.74 | 727.17 | * | 11.80 | 3.52E-01 | 2.20E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.86 | 238.63 | * | 44.60 | 5.75E-01 | 1.10E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.99 | 609.31 | * | 46.30 | 4.95E-01 | 1.11E-01 |
| | | 1120.29 | * | 15.10 | 6.28E-01 | 2.56E-01 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| BI-214 | 0.99 | 1764.49 | * | 15.80 | 6.62E-01 | 2.90E-01 |
| | | 2204.22 | * | 4.98 | 6.95E-01 | 7.66E-01 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 5.25E-01 | 1.48E-01 |
| | | 351.92 | * | 37.19 | 6.07E-01 | 1.24E-01 |
| RA-226 | 0.97 | 186.21 | * | 3.28 | 7.74E-01 | 1.61E+00 |
| AC-228 | 0.56 | 338.32 | * | 11.40 | 4.84E-01 | 2.71E-01 |
| | | 911.07 | * | 27.70 | 4.46E-01 | 1.63E-01 |
| | | 969.11 | | 16.60 | | |
| NP-237 | 0.93 | 86.50 | * | 12.60 | 1.78E-01 | 1.43E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.995 | 8.93E+00 | 1.27E+00 | |
| | ZN-65 | 0.959 | 6.24E-02 | 6.67E-02 | |
| ? | CD-109 | 0.888 | 7.00E-01 | 5.65E-01 | |
| ? | SN-126 | 0.975 | 6.07E-02 | 4.89E-02 | |
| ? | EU-155 | 0.319 | 7.55E-02 | 6.08E-02 | |
| | TL-208 | 0.987 | 4.21E-01 | 8.83E-02 | |
| | BI-212 | 0.744 | 3.52E-01 | 2.20E-01 | |
| | PB-212 | 0.868 | 5.75E-01 | 1.10E-01 | |
| | BI-214 | 0.996 | 5.34E-01 | 9.53E-02 | |
| | PB-214 | 0.998 | 5.73E-01 | 9.53E-02 | |
| | RA-226 | 0.975 | 7.74E-01 | 1.61E+00 | |
| | AC-228 | 0.562 | 4.56E-01 | 1.39E-01 | |
| ? | NP-237 | 0.931 | 1.78E-01 | 1.43E-01 | |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 10:01:44AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 76.09 | 1.39583E-01 | 13.69 | | |
| | 3 | 92.83 | 1.55429E-02 | 55.82 | | |
| | 9 | 372.43 | 8.12027E-03 | 45.35 | Sum | |
| | 10 | 510.91 | 2.15115E-02 | 32.24 | | |
| m | 14 | 733.42 | 6.62015E-03 | 29.30 | Tol. | PA-234 |
| M | 15 | 768.45 | 9.06770E-03 | 32.99 | Sum | |
| m | 16 | 772.39 | 4.08844E-03 | 66.57 | | |
| | 19 | 967.83 | 2.72177E-02 | 18.61 | | |
| | 20 | 1092.17 | 7.67532E-03 | 45.78 | | |
| | 23 | 1377.36 | 3.45734E-03 | 59.89 | | |
| | 24 | 1432.80 | 2.50000E-03 | 54.43 | | |
| | 26 | 1511.87 | 5.27778E-03 | 47.66 | | |
| | 27 | 1553.60 | 2.77778E-03 | 31.62 | | |
| | 28 | 1563.90 | 2.50000E-03 | 48.59 | | |
| | 29 | 1660.44 | 1.94444E-03 | 54.40 | | |
| | 30 | 1729.92 | 3.29475E-03 | 46.18 | Sum | |
| | 32 | 1771.19 | 1.97531E-03 | 51.67 | | |
| | 33 | 2103.90 | 2.22222E-03 | 35.36 | S-Esc | |

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

## *NUCLIDE MDA REPORT*

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | 8.23E-01 | 1.21E+00 | 1.21E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | -3.69E-02 | 5.06E-02 | 5.06E-02 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | -6.17E-04 | 2.96E-02 | 2.96E-02 |
| + | | K-40 | 1460.81 | * | 10.67 | 8.93E+00 | 8.13E-01 | 8.13E-01 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | -3.41E-03 | 2.96E-02 | 2.96E-02 |
| | | | 78.34 | | 96.00 | -1.38E-02 | | 3.20E-02 |
| + | | SC-46 | 889.25 | | 99.98 | 4.02E-02 | 1.05E-01 | 1.05E-01 |
| | | | 1120.51 | | 99.99 | 1.68E-01 | | 1.85E-01 |
| + | | V-48 | 983.52 | | 99.98 | -3.06E-01 | 3.34E+00 | 3.34E+00 |
| | | | 1312.10 | | 97.50 | 1.91E+00 | | 3.65E+00 |
| + | | CR-51 | 320.08 | | 9.83 | -7.05E-01 | 3.81E+00 | 3.81E+00 |
| + | | MN-54 | 834.83 | | 99.97 | 9.17E-03 | 6.31E-02 | 6.31E-02 |
| + | | CO-56 | 846.75 | | 99.96 | -5.12E-02 | 9.97E-02 | 9.97E-02 |
| | | | 1037.75 | | 14.03 | -5.25E-01 | | 7.46E-01 |
| | | | 1238.25 | | 67.00 | 1.32E-01 | | 2.60E-01 |
| | | | 1771.40 | | 15.51 | -1.27E+00 | | 7.30E-01 |
| | | | 2598.48 | | 16.90 | 3.52E-02 | | 6.38E-01 |
| + | | CO-57 | 122.06 | | 85.51 | 1.31E-02 | 3.42E-02 | 3.42E-02 |
| | | | 136.48 | | 10.60 | -1.84E-02 | | 3.67E-01 |
| + | | CO-58 | 810.76 | | 99.40 | -6.77E-02 | 1.05E-01 | 1.05E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | -1.24E-01 | 3.72E-01 | 3.72E-01 |
| | | | 1291.56 | | 43.20 | 7.33E-02 | | 4.92E-01 |
| + | | CO-60 | 1173.22 | | 100.00 | 2.25E-02 | 5.15E-02 | 6.63E-02 |
| | | | 1332.49 | | 100.00 | 2.11E-02 | | 5.15E-02 |
| + | | ZN-65 | 1115.52 | * | 50.75 | 6.24E-02 | 2.07E-01 | 2.07E-01 |
| + | | GA-67 | 93.31 | | 35.70 | 1.41E+08 | 1.16E+08 | 1.16E+08 |
| | | | 208.95 | | 2.24 | 3.41E+08 | | 2.18E+09 |
| | | | 300.22 | | 16.00 | 1.67E+08 | | 3.05E+08 |
| + | | SE-75 | 121.11 | | 16.70 | -9.40E-02 | 9.02E-02 | 2.29E-01 |
| | | | 136.00 | | 59.20 | -1.46E-02 | | 9.02E-02 |
| | | | 264.65 | | 59.80 | 3.54E-03 | | 9.74E-02 |
| | | | 279.53 | | 25.20 | 2.83E-02 | | 2.46E-01 |
| | | | 400.65 | | 11.40 | -2.86E-01 | | 4.82E-01 |
| + | | RB-82 | 776.52 | | 13.00 | 9.45E-01 | 5.03E+00 | 5.03E+00 |
| + | | RB-83 | 520.41 | | 46.00 | 2.08E-02 | 1.62E-01 | 1.62E-01 |
| | | | 529.64 | | 30.30 | -9.75E-02 | | 2.28E-01 |
| | | | 552.65 | | 16.40 | -4.14E-02 | | 4.53E-01 |
| + | | KR-85 | 513.99 | | 0.43 | -3.39E+00 | 9.72E+00 | 9.72E+00 |
| + | | SR-85 | 513.99 | | 99.27 | -4.20E-02 | 1.20E-01 | 1.20E-01 |
| + | | Y-88 | 898.02 | | 93.40 | -1.88E-03 | 7.93E-02 | 8.68E-02 |
| | | | 1836.01 | | 99.38 | -2.86E-02 | | 7.93E-02 |
| + | | MO-93 | 263.06 | | 56.72 | -2.86E-02 | 3.67E-02 | 5.62E-02 |
| | | | 684.67 | | 99.68 | -4.44E-03 | | 4.36E-02 |
| | | | 1477.11 | | 99.08 | -1.03E-02 | | 3.67E-02 |
| + | | NB-93M | 16.57 | | 9.43 | 0.00E+00 | 5.31E+00 | 5.31E+00 |
| + | | NB-94 | 702.63 | | 100.00 | -1.70E-02 | 3.93E-02 | 3.93E-02 |
| | | | 871.10 | | 100.00 | 1.18E-03 | | 4.20E-02 |
| + | | NB-95 | 765.79 | | 99.81 | 1.55E-01 | 3.73E-01 | 3.73E-01 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | NB-95M | 235.69 | | 25.00 | -1.89E+08 | 3.26E+07 | 3.26E+07 |
| + | ZR-95 | 724.18 | | 43.70 | 1.26E-01 | 2.37E-01 | 3.38E-01 |
| | | 756.72 | | 55.30 | 1.13E-01 | | 2.37E-01 |
| + | MO-99 | 181.06 | | 6.20 | -7.36E+09 | 1.90E+10 | 3.72E+10 |
| | | 739.58 | | 12.80 | -7.03E+09 | | 1.90E+10 |
| | | 778.00 | | 4.50 | 2.25E+10 | | 7.22E+10 |
| + | RU-103 | 497.08 | | 89.00 | -5.80E-03 | 2.14E-01 | 2.14E-01 |
| + | RU-106 | 621.84 | | 9.80 | 3.12E-02 | 5.07E-01 | 5.07E-01 |
| + | AG-108M | 433.93 | | 89.90 | -9.83E-03 | 3.53E-02 | 3.53E-02 |
| | | 614.37 | | 90.40 | 1.08E-02 | | 4.77E-02 |
| | | 722.95 | | 90.50 | 3.81E-03 | | 5.27E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 7.00E-01 | 9.06E-01 | 9.06E-01 |
| + | AG-110M | 657.75 | | 93.14 | -1.95E-02 | 5.38E-02 | 5.38E-02 |
| | | 677.61 | | 10.53 | 2.30E-01 | | 5.30E-01 |
| | | 706.67 | | 16.46 | 1.25E-02 | | 3.16E-01 |
| | | 763.93 | | 21.98 | -2.56E-01 | | 2.75E-01 |
| | | 884.67 | | 71.63 | -1.74E-03 | | 8.13E-02 |
| | | 1384.27 | | 23.94 | 6.75E-02 | | 3.02E-01 |
| + | CD-113M | 263.70 | | 0.02 | -7.10E+00 | 1.42E+02 | 1.42E+02 |
| + | SN-113 | 255.12 | | 1.93 | 7.13E-01 | 9.33E-02 | 3.18E+00 |
| | | 391.69 | | 64.90 | -5.87E-02 | | 9.33E-02 |
| + | TE123M | 159.00 | | 84.10 | -1.90E-03 | 6.34E-02 | 6.34E-02 |
| + | SB-124 | 602.71 | | 97.87 | 4.07E-02 | 1.33E-01 | 1.33E-01 |
| | | 645.85 | | 7.26 | 3.48E-01 | | 1.73E+00 |
| | | 722.78 | | 11.10 | 2.76E-01 | | 1.22E+00 |
| | | 1691.02 | | 49.00 | 2.18E-02 | | 2.51E-01 |
| + | I-125 | 35.49 | | 6.49 | -2.81E+01 | 4.08E+00 | 4.08E+00 |
| + | SB-125 | 176.33 | | 6.89 | 3.51E-02 | 1.14E-01 | 4.79E-01 |
| | | 427.89 | | 29.33 | -4.11E-02 | | 1.14E-01 |
| | | 463.38 | | 10.35 | 3.49E-01 | | 4.41E-01 |
| | | 600.56 | | 17.80 | 2.20E-02 | | 2.49E-01 |
| | | 635.90 | | 11.32 | -1.31E-01 | | 3.54E-01 |
| + | SB-126 | 414.70 | | 83.30 | 1.93E+00 | 1.03E+01 | 1.03E+01 |
| | | 666.33 | | 99.60 | -2.79E+00 | | 1.06E+01 |
| | | 695.00 | | 99.60 | 3.17E+00 | | 1.15E+01 |
| | | 720.50 | | 53.80 | 4.84E+00 | | 1.86E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 6.07E-02 | 7.85E-02 | 7.85E-02 |
| + | SB-127 | 473.00 | | 25.00 | -1.11E+06 | 7.06E+06 | 7.06E+06 |
| | | 685.20 | | 35.70 | 1.38E+06 | | 7.13E+06 |
| | | 783.80 | | 14.70 | 2.11E+05 | | 1.81E+07 |
| + | I-129 | 29.78 | | 57.00 | 2.23E-01 | 3.04E-01 | 3.04E-01 |
| | | 33.60 | | 13.20 | 7.33E+00 | | 1.56E+00 |
| | | 39.58 | | 7.52 | 2.64E-01 | | 8.13E-01 |
| + | I-131 | 284.30 | | 6.05 | -1.08E+03 | 1.95E+02 | 2.65E+03 |
| | | 364.48 | | 81.20 | -4.15E+01 | | 1.95E+02 |
| | | 636.97 | | 7.26 | -3.03E+02 | | 2.69E+03 |
| | | 722.89 | | 1.80 | 9.88E+02 | | 1.37E+04 |
| + | TE-132 | 49.72 | | 13.10 | 1.55E+07 | 5.41E+07 | 3.54E+08 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | TE-132 | 228.16 | 88.00 | 1.47E+07 | 5.41E+07 | 5.41E+07 |
| + | | BA-133 | 81.00 | 33.00 | 2.82E-02 | 5.83E-02 | 7.96E-02 |
| | | | 302.84 | 17.80 | -2.18E-01 | | 1.74E-01 |
| | | | 356.01 | 60.00 | 8.44E-03 | | 5.83E-02 |
| + | @ | I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | XE-133 | 81.00 | 38.00 | 1.19E+04 | 3.35E+04 | 3.35E+04 |
| + | | CS-134 | 563.23 | 8.38 | 2.11E-01 | 4.63E-02 | 4.70E-01 |
| | | | 569.32 | 15.43 | 3.75E-02 | | 2.62E-01 |
| | | | 604.70 | 97.60 | 3.06E-03 | | 4.63E-02 |
| | | | 795.84 | 85.40 | 1.04E-02 | | 6.40E-02 |
| | | | 801.93 | 8.73 | 8.17E-02 | | 5.94E-01 |
| + | | CS-135 | 268.24 | 16.00 | -2.40E-03 | 2.22E-01 | 2.22E-01 |
| + | @ | I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | | CS-136 | 153.22 | 7.46 | 1.01E+01 | 8.27E+00 | 7.65E+01 |
| | | | 163.89 | 4.61 | 1.01E+01 | | 1.21E+02 |
| | | | 176.55 | 13.56 | 3.09E+00 | | 4.22E+01 |
| | | | 273.65 | 12.66 | -7.04E+01 | | 4.34E+01 |
| | | | 340.57 | 48.50 | -9.35E+00 | | 1.31E+01 |
| | | | 818.50 | 99.70 | -1.39E+00 | | 8.27E+00 |
| | | | 1048.07 | 79.60 | 2.05E+00 | | 1.37E+01 |
| | | | 1235.34 | 19.70 | 2.20E+01 | | 6.72E+01 |
| + | | CS-137 | 661.65 | 85.12 | 2.24E-02 | 5.16E-02 | 5.16E-02 |
| + | | LA-138 | 788.74 | 34.00 | 2.13E-02 | 7.15E-02 | 1.43E-01 |
| | | | 1435.80 | 66.00 | 1.12E-02 | | 7.15E-02 |
| + | | CE-139 | 165.85 | 80.35 | -1.98E-02 | 6.00E-02 | 6.00E-02 |
| + | | BA-140 | 162.64 | 6.70 | 1.44E+01 | 2.88E+01 | 9.75E+01 |
| | | | 304.84 | 4.50 | 1.99E+01 | | 1.52E+02 |
| | | | 423.70 | 3.20 | 9.17E+01 | | 2.33E+02 |
| | | | 437.55 | 2.00 | -1.86E+02 | | 3.31E+02 |
| | | | 537.32 | 25.00 | 3.37E+00 | | 2.88E+01 |
| + | | LA-140 | 328.77 | 20.50 | 5.88E+00 | 1.18E+01 | 3.78E+01 |
| | | | 487.03 | 45.50 | -4.54E-01 | | 1.65E+01 |
| | | | 815.85 | 23.50 | -5.93E+00 | | 3.80E+01 |
| | | | 1596.49 | 95.49 | 2.09E+00 | | 1.18E+01 |
| + | | CE-141 | 145.44 | 48.40 | 2.02E-01 | 5.25E-01 | 5.25E-01 |
| + | @ | CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | | CE-144 | 133.54 | 10.80 | -6.80E-03 | 2.75E-01 | 2.75E-01 |
| + | | PM-144 | 476.78 | 42.00 | 6.81E-02 | 4.95E-02 | 1.00E-01 |
| | | | 618.01 | 98.60 | 1.29E-03 | | 4.95E-02 |
| | | | 696.49 | 99.49 | 1.19E-02 | | 5.44E-02 |
| + | | PM-145 | 36.85 | 21.70 | 1.27E-01 | 1.87E-01 | 3.63E-01 |
| | | | 37.36 | 39.70 | -4.25E-02 | | 1.87E-01 |
| | | | 42.30 | 15.10 | -6.53E-02 | | 2.88E-01 |
| | | | 72.40 | 2.31 | -4.73E+00 | | 1.25E+00 |
| + | | PM-146 | 453.90 | 39.94 | 3.43E-03 | 8.50E-02 | 8.50E-02 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | PM-146 | 735.90 | | 14.01 | 2.67E-04 | 8.50E-02 | 2.88E-01 |
| | | 747.13 | | 13.10 | 1.28E-01 | | 3.43E-01 |
| + | ND-147 | 91.11 | | 28.90 | -7.42E+01 | 4.79E+01 | 4.79E+01 |
| | | 531.02 | | 13.10 | 2.84E+01 | | 1.35E+02 |
| + | PM-149 | 285.90 | | 3.10 | -5.76E+12 | 2.97E+13 | 2.97E+13 |
| + | EU-152 | 121.78 | | 20.50 | 4.28E-02 | 1.12E-01 | 1.12E-01 |
| | | 244.69 | | 5.40 | -2.92E-01 | | 6.03E-01 |
| | | 344.27 | | 19.13 | -3.62E-02 | | 1.61E-01 |
| | | 778.89 | | 9.20 | 1.58E-01 | | 5.05E-01 |
| | | 964.01 | | 10.40 | -6.07E-01 | | 5.79E-01 |
| | | 1085.78 | | 7.22 | 2.96E-02 | | 6.48E-01 |
| | | 1112.02 | | 9.60 | 9.09E-03 | | 4.97E-01 |
| | | 1407.95 | | 14.94 | -1.38E-01 | | 3.31E-01 |
| + | GD-153 | 97.43 | | 31.30 | -1.48E-02 | 9.64E-02 | 9.64E-02 |
| | | 103.18 | | 22.20 | -3.64E-02 | | 1.31E-01 |
| + | EU-154 | 123.07 | | 40.50 | -1.55E-02 | 5.65E-02 | 5.65E-02 |
| | | 723.30 | | 19.70 | 1.79E-02 | | 2.47E-01 |
| | | 873.19 | | 11.50 | 1.29E-01 | | 3.98E-01 |
| | | 996.32 | | 10.30 | -1.53E-01 | | 5.01E-01 |
| | | 1004.76 | | 17.90 | 5.43E-02 | | 2.87E-01 |
| | | 1274.45 | | 35.50 | -9.87E-02 | | 1.35E-01 |
| + | EU-155 | 86.50 | * | 30.90 | 7.55E-02 | 9.76E-02 | 9.76E-02 |
| | | 105.30 | | 20.70 | 1.20E-02 | | 1.13E-01 |
| + | EU-156 | 811.77 | | 10.40 | -1.02E+01 | 3.52E+01 | 3.52E+01 |
| | | 1153.47 | | 7.20 | 1.89E+00 | | 7.47E+01 |
| | | 1230.71 | | 8.90 | 6.90E+00 | | 6.08E+01 |
| + | HO-166M | 184.41 | | 72.60 | 7.65E-02 | 5.32E-02 | 5.32E-02 |
| | | 280.45 | | 29.60 | 1.30E-04 | | 1.14E-01 |
| | | 410.94 | | 11.10 | 2.18E-01 | | 3.44E-01 |
| | | 711.69 | | 54.10 | -5.84E-03 | | 7.26E-02 |
| + | TM-171 | 66.72 | | 0.14 | 9.59E+00 | 2.24E+01 | 2.24E+01 |
| + | HF-172 | 67.35 | | 5.31 | -6.71E-02 | 2.24E-01 | 5.82E-01 |
| | | 125.81 | | 11.30 | 1.31E-02 | | 2.24E-01 |
| + | LU-172 | 181.53 | | 20.60 | -2.66E+01 | 2.55E+03 | 4.51E+03 |
| | | 900.72 | | 29.81 | 9.32E+02 | | 4.70E+03 |
| | | 1093.66 | | 62.50 | 9.96E+02 | | 2.55E+03 |
| + | LU-173 | 100.72 | | 5.24 | 9.91E-02 | 1.95E-01 | 4.84E-01 |
| | | 272.11 | | 21.20 | 2.25E-01 | | 1.95E-01 |
| + | HF-175 | 343.40 | | 84.00 | -9.62E-03 | 9.56E-02 | 9.56E-02 |
| + | LU-176 | 88.34 | | 13.30 | 5.32E-02 | 3.48E-02 | 2.09E-01 |
| | | 201.83 | | 86.00 | -3.94E-03 | | 3.77E-02 |
| | | 306.78 | | 94.00 | 1.20E-02 | | 3.48E-02 |
| + | HF-181 | 133.02 | | 41.70 | -7.29E-03 | 1.88E-01 | 2.79E-01 |
| | | 345.85 | | 17.20 | 1.55E-01 | | 9.55E-01 |
| | | 482.03 | | 82.80 | -9.81E-02 | | 1.88E-01 |
| + | TA-182 | 67.75 | | 41.20 | -1.42E-02 | 1.23E-01 | 1.23E-01 |
| | | 1121.30 | | 34.90 | 2.79E-02 | | 4.31E-01 |
| | | 1189.05 | | 16.23 | -6.91E-02 | | 6.17E-01 |
| | | 1221.41 | | 26.98 | 1.90E-01 | | 4.34E-01 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | TA-182 | 1231.02 | | 11.44 | 1.06E-01 | 1.23E-01 | 9.34E-01 |
| + | IR-192 | 308.46 | | 29.68 | 9.72E-02 | 1.77E-01 | 2.69E-01 |
| | | 468.07 | | 48.10 | -2.39E-02 | | 1.77E-01 |
| + | HG-203 | 279.19 | | 77.30 | 1.74E-01 | 2.05E-01 | 2.05E-01 |
| + | TL-204 | 374.74 | | 94.11 | -3.91E-03 | 3.36E-02 | 3.36E-02 |
| | | 899.15 | | 99.16 | -1.71E-02 | | 4.75E-02 |
| | | 911.74 | | 91.10 | 1.41E-01 | | 9.27E-02 |
| + | BI-207 | 569.67 | | 97.72 | 5.44E-03 | 3.80E-02 | 3.80E-02 |
| | | 1063.62 | | 74.90 | -9.99E-03 | | 6.38E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 4.82E-01 | 8.17E-02 | 1.71E-01 |
| | | 860.37 | * | 4.48 | 8.26E-01 | | 1.35E+00 |
| | | 2614.66 | * | 35.85 | 3.66E-01 | | 8.17E-02 |
| + | BI-210M | 262.00 | | 45.00 | 2.50E-03 | 7.14E-02 | 7.14E-02 |
| | | 300.00 | | 23.00 | 8.14E-02 | | 1.49E-01 |
| + | PB-210 | 46.50 | | 4.25 | 8.16E-01 | 9.72E-01 | 9.72E-01 |
| + | PB-211 | 404.84 | | 2.90 | -8.28E-01 | 1.13E+00 | 1.13E+00 |
| | | 831.96 | | 2.90 | -1.15E-01 | | 1.62E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 3.52E-01 | 4.71E-01 | 4.71E-01 |
| | | 1620.62 | | 2.75 | 7.44E-01 | | 1.96E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 5.75E-01 | 1.46E-01 | 1.46E-01 |
| | | 300.09 | | 3.41 | 5.49E-01 | | 1.00E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 4.95E-01 | 1.31E-01 | 1.31E-01 |
| | | 1120.29 | * | 15.10 | 6.28E-01 | | 5.53E-01 |
| | | 1764.49 | * | 15.80 | 6.62E-01 | | 3.72E-01 |
| | | 2204.22 | * | 4.98 | 6.95E-01 | | 1.23E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 5.25E-01 | 1.58E-01 | 2.02E-01 |
| | | 351.92 | * | 37.19 | 6.07E-01 | | 1.58E-01 |
| + | RN-219 | 401.80 | | 6.50 | -7.18E-03 | 4.88E-01 | 4.88E-01 |
| + | RA-223 | 323.87 | | 3.88 | -6.87E-01 | 7.64E-01 | 7.64E-01 |
| + | RA-224 | 240.98 | | 3.95 | 3.53E+00 | 1.52E+00 | 1.52E+00 |
| + | RA-225 | 40.00 | | 31.00 | 6.47E+00 | 1.99E+01 | 1.99E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 7.74E-01 | 1.25E+00 | 1.25E+00 |
| + | TH-227 | 50.10 | | 8.40 | 1.64E-02 | 3.76E-01 | 3.76E-01 |
| | | 236.00 | | 11.50 | -2.21E+00 | | 3.82E-01 |
| | | 256.20 | | 6.30 | -5.35E-02 | | 5.36E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 4.84E-01 | 2.21E-01 | 4.21E-01 |
| | | 911.07 | * | 27.70 | 4.46E-01 | | 2.21E-01 |
| | | 969.11 | | 16.60 | 5.01E-01 | | 4.65E-01 |
| + | TH-230 | 48.44 | | 16.90 | -7.77E-02 | 2.02E-01 | 2.02E-01 |
| | | 62.85 | | 4.60 | 5.18E-01 | | 7.09E-01 |
| | | 67.67 | | 0.37 | -8.69E-01 | | 7.54E+00 |
| + | PA-231 | 283.67 | | 1.60 | -7.89E-01 | 1.32E+00 | 1.94E+00 |
| | | 302.67 | | 2.30 | -1.66E+00 | | 1.32E+00 |
| + | TH-231 | 25.64 | | 14.70 | 0.00E+00 | 9.44E-02 | 9.44E-02 |
| | | 84.21 | | 6.40 | 2.57E-01 | | 4.04E-01 |
| + | PA-233 | 311.98 | | 38.60 | -8.10E-01 | 9.26E-01 | 9.26E-01 |
| + | PA-234 | 131.20 | | 20.40 | -1.64E-02 | 1.17E-01 | 1.17E-01 |
| | | 733.99 | | 8.80 | -9.92E-02 | | 4.15E-01 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | PA-234 | 946.00 | | 12.00 | -2.76E-02 | 1.17E-01 | 3.94E-01 |
| + | PA-234M | 1001.03 | | 0.92 | -6.24E-01 | 5.32E+00 | 5.32E+00 |
| + | TH-234 | 63.29 | | 3.80 | 1.10E+00 | 8.75E-01 | 8.75E-01 |
| + | U-235 | 143.76 | | 10.50 | 1.84E-01 | 2.97E-01 | 2.97E-01 |
| | | 163.35 | | 4.70 | 5.31E-02 | | 6.40E-01 |
| | | 205.31 | | 4.70 | 3.05E-01 | | 7.12E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 1.78E-01 | 2.31E-01 | 2.31E-01 |
| + | NP-239 | 106.10 | | 22.70 | 5.01E+10 | 4.71E+11 | 4.71E+11 |
| | | 228.18 | | 10.70 | 3.95E+11 | | 1.45E+12 |
| | | 277.60 | | 14.10 | -5.47E+11 | | 1.12E+12 |
| + | AM-241 | 59.54 | | 35.90 | 3.04E-02 | 8.51E-02 | 8.51E-02 |
| + | AM-243 | 74.67 | | 66.00 | -8.47E-02 | 5.57E-02 | 5.57E-02 |
| + | CM-243 | 209.75 | | 3.29 | 4.99E-01 | 2.39E-01 | 1.04E+00 |
| | | 228.14 | | 10.60 | 8.49E-02 | | 3.12E-01 |
| | | 277.60 | | 14.00 | -1.17E-01 | | 2.39E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.21E+00 | 1.21E+00 | 8.23E-01 | 5.65E-01 |
| | NA-22 | 1274.54 | | 99.94 | 5.06E-02 | 5.06E-02 | -3.69E-02 | 2.25E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 2.96E-02 | 2.96E-02 | -6.17E-04 | 1.15E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 8.13E-01 | 8.13E-01 | 8.93E+00 | 3.80E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TI-44 | 67.88 | | 94.40 | 2.96E-02 | 2.96E-02 | -3.41E-03 | 1.43E-02 |
| | | 78.34 | | 96.00 | 3.20E-02 | | -1.38E-02 | 1.55E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.05E-01 | 1.05E-01 | 4.02E-02 | 4.79E-02 |
| | | 1120.51 | | 99.99 | 1.85E-01 | | 1.68E-01 | 8.73E-02 |
| | V-48 | 983.52 | | 99.98 | 3.34E+00 | 3.34E+00 | -3.06E-01 | 1.52E+00 |
| | | 1312.10 | | 97.50 | 3.65E+00 | | 1.91E+00 | 1.63E+00 |
| | CR-51 | 320.08 | | 9.83 | 3.81E+00 | 3.81E+00 | -7.05E-01 | 1.80E+00 |
| | MN-54 | 834.83 | | 99.97 | 6.31E-02 | 6.31E-02 | 9.17E-03 | 2.93E-02 |
| | CO-56 | 846.75 | | 99.96 | 9.97E-02 | 9.97E-02 | -5.12E-02 | 4.54E-02 |
| | | 1037.75 | | 14.03 | 7.46E-01 | | -5.25E-01 | 3.35E-01 |
| | | 1238.25 | | 67.00 | 2.60E-01 | | 1.32E-01 | 1.21E-01 |
| | | 1771.40 | | 15.51 | 7.30E-01 | | -1.27E+00 | 3.14E-01 |
| | | 2598.48 | | 16.90 | 6.38E-01 | | 3.52E-02 | 2.65E-01 |
| | CO-57 | 122.06 | | 85.51 | 3.42E-02 | 3.42E-02 | 1.31E-02 | 1.64E-02 |
| | | 136.48 | | 10.60 | 3.67E-01 | | -1.84E-02 | 1.77E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.05E-01 | 1.05E-01 | -6.77E-02 | 4.79E-02 |
| | FE-59 | 1099.22 | | 56.50 | 3.72E-01 | 3.72E-01 | -1.24E-01 | 1.67E-01 |
| | | 1291.56 | | 43.20 | 4.92E-01 | | 7.33E-02 | 2.18E-01 |
| | CO-60 | 1173.22 | | 100.00 | 6.63E-02 | 5.15E-02 | 2.25E-02 | 3.06E-02 |
| | | 1332.49 | | 100.00 | 5.15E-02 | | 2.11E-02 | 2.30E-02 |
| + | ZN-65 | 1115.52 | * | 50.75 | 2.07E-01 | 2.07E-01 | 6.24E-02 | 9.75E-02 |
| | GA-67 | 93.31 | | 35.70 | 1.16E+08 | 1.16E+08 | 1.41E+08 | 5.60E+07 |
| | | 208.95 | | 2.24 | 2.18E+09 | | 3.41E+08 | 1.05E+09 |
| | | 300.22 | | 16.00 | 3.05E+08 | | 1.67E+08 | 1.45E+08 |
| | SE-75 | 121.11 | | 16.70 | 2.29E-01 | 9.02E-02 | -9.40E-02 | 1.09E-01 |
| | | 136.00 | | 59.20 | 9.02E-02 | | -1.46E-02 | 4.36E-02 |
| | | 264.65 | | 59.80 | 9.74E-02 | | 3.54E-03 | 4.64E-02 |
| | | 279.53 | | 25.20 | 2.46E-01 | | 2.83E-02 | 1.17E-01 |
| | | 400.65 | | 11.40 | 4.82E-01 | | -2.86E-01 | 2.25E-01 |
| | RB-82 | 776.52 | | 13.00 | 5.03E+00 | 5.03E+00 | 9.45E-01 | 2.32E+00 |
| | RB-83 | 520.41 | | 46.00 | 1.62E-01 | 1.62E-01 | 2.08E-02 | 7.48E-02 |
| | | 529.64 | | 30.30 | 2.28E-01 | | -9.75E-02 | 1.04E-01 |
| | | 552.65 | | 16.40 | 4.53E-01 | | -4.14E-02 | 2.09E-01 |
| | KR-85 | 513.99 | | 0.43 | 9.72E+00 | 9.72E+00 | -3.39E+00 | 4.56E+00 |
| | SR-85 | 513.99 | | 99.27 | 1.20E-01 | 1.20E-01 | -4.20E-02 | 5.66E-02 |
| | Y-88 | 898.02 | | 93.40 | 8.68E-02 | 7.93E-02 | -1.88E-03 | 3.94E-02 |
| | | 1836.01 | | 99.38 | 7.93E-02 | | -2.86E-02 | 3.32E-02 |
| | MO-93 | 263.06 | | 56.72 | 5.62E-02 | 3.67E-02 | -2.86E-02 | 2.67E-02 |
| | | 684.67 | | 99.68 | 4.36E-02 | | -4.44E-03 | 2.02E-02 |
| | | 1477.11 | | 99.08 | 3.67E-02 | | -1.03E-02 | 1.54E-02 |
| | NB-93M | 16.57 | | 9.43 | 5.31E+00 | 5.31E+00 | 0.00E+00 | 0.00E+00 |
| | NB-94 | 702.63 | | 100.00 | 3.93E-02 | 3.93E-02 | -1.70E-02 | 1.80E-02 |
| | | 871.10 | | 100.00 | 4.20E-02 | | 1.18E-03 | 1.91E-02 |
| | NB-95 | 765.79 | | 99.81 | 3.73E-01 | 3.73E-01 | 1.55E-01 | 1.74E-01 |
| | NB-95M | 235.69 | | 25.00 | 3.26E+07 | 3.26E+07 | -1.89E+08 | 1.58E+07 |
| | ZR-95 | 724.18 | | 43.70 | 3.38E-01 | 2.37E-01 | 1.26E-01 | 1.58E-01 |
| | | 756.72 | | 55.30 | 2.37E-01 | | 1.13E-01 | 1.09E-01 |
| | MO-99 | 181.06 | | 6.20 | 3.72E+10 | 1.90E+10 | -7.36E+09 | 1.79E+10 |
| | | 739.58 | | 12.80 | 1.90E+10 | | -7.03E+09 | 8.57E+09 |
| | | 778.00 | | 4.50 | 7.22E+10 | | 2.25E+10 | 3.33E+10 |
| | RU-103 | 497.08 | | 89.00 | 2.14E-01 | 2.14E-01 | -5.80E-03 | 9.92E-02 |
| | RU-106 | 621.84 | | 9.80 | 5.07E-01 | 5.07E-01 | 3.12E-02 | 2.36E-01 |
| | AG-108M | 433.93 | | 89.90 | 3.53E-02 | 3.53E-02 | -9.83E-03 | 1.64E-02 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | AG-108M | 614.37 | | 90.40 | 4.77E-02 | 3.53E-02 | 1.08E-02 | 2.22E-02 |
| | | 722.95 | | 90.50 | 5.27E-02 | | 3.81E-03 | 2.45E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 9.06E-01 | 9.06E-01 | 7.00E-01 | 4.39E-01 |
| | AG-110M | 657.75 | | 93.14 | 5.38E-02 | 5.38E-02 | -1.95E-02 | 2.47E-02 |
| | | 677.61 | | 10.53 | 5.30E-01 | | 2.30E-01 | 2.46E-01 |
| | | 706.67 | | 16.46 | 3.16E-01 | | 1.25E-02 | 1.45E-01 |
| | | 763.93 | | 21.98 | 2.75E-01 | | -2.56E-01 | 1.27E-01 |
| | | 884.67 | | 71.63 | 8.13E-02 | | -1.74E-03 | 3.71E-02 |
| | | 1384.27 | | 23.94 | 3.02E-01 | | 6.75E-02 | 1.36E-01 |
| | CD-113M | 263.70 | | 0.02 | 1.42E+02 | 1.42E+02 | -7.10E+00 | 6.78E+01 |
| | SN-113 | 255.12 | | 1.93 | 3.18E+00 | 9.33E-02 | 7.13E-01 | 1.52E+00 |
| | | 391.69 | | 64.90 | 9.33E-02 | | -5.87E-02 | 4.38E-02 |
| | TE123M | 159.00 | | 84.10 | 6.34E-02 | 6.34E-02 | -1.90E-03 | 3.05E-02 |
| | SB-124 | 602.71 | | 97.87 | 1.33E-01 | 1.33E-01 | 4.07E-02 | 6.18E-02 |
| | | 645.85 | | 7.26 | 1.73E+00 | | 3.48E-01 | 8.00E-01 |
| | | 722.78 | | 11.10 | 1.22E+00 | | 2.76E-01 | 5.62E-01 |
| | | 1691.02 | | 49.00 | 2.51E-01 | | 2.18E-02 | 1.05E-01 |
| | I-125 | 35.49 | | 6.49 | 4.08E+00 | 4.08E+00 | -2.81E+01 | 1.96E+00 |
| | SB-125 | 176.33 | | 6.89 | 4.79E-01 | 1.14E-01 | 3.51E-02 | 2.30E-01 |
| | | 427.89 | | 29.33 | 1.14E-01 | | -4.11E-02 | 5.33E-02 |
| | | 463.38 | | 10.35 | 4.41E-01 | | 3.49E-01 | 2.08E-01 |
| | | 600.56 | | 17.80 | 2.49E-01 | | 2.20E-02 | 1.16E-01 |
| | | 635.90 | | 11.32 | 3.54E-01 | | -1.31E-01 | 1.63E-01 |
| | SB-126 | 414.70 | | 83.30 | 1.03E+01 | 1.03E+01 | 1.93E+00 | 4.85E+00 |
| | | 666.33 | | 99.60 | 1.06E+01 | | -2.79E+00 | 4.92E+00 |
| | | 695.00 | | 99.60 | 1.15E+01 | | 3.17E+00 | 5.33E+00 |
| | | 720.50 | | 53.80 | 1.86E+01 | | 4.84E+00 | 8.54E+00 |
| + | SN-126 | 87.57 | * | 37.00 | 7.85E-02 | 7.85E-02 | 6.07E-02 | 3.80E-02 |
| | SB-127 | 473.00 | | 25.00 | 7.06E+06 | 7.06E+06 | -1.11E+06 | 3.26E+06 |
| | | 685.20 | | 35.70 | 7.13E+06 | | 1.38E+06 | 3.31E+06 |
| | | 783.80 | | 14.70 | 1.81E+07 | | 2.11E+05 | 8.36E+06 |
| | I-129 | 29.78 | | 57.00 | 3.04E-01 | 3.04E-01 | 2.23E-01 | 1.46E-01 |
| | | 33.60 | | 13.20 | 1.56E+00 | | 7.33E+00 | 7.67E-01 |
| | | 39.58 | | 7.52 | 8.13E-01 | | 2.64E-01 | 3.91E-01 |
| | I-131 | 284.30 | | 6.05 | 2.65E+03 | 1.95E+02 | -1.08E+03 | 1.26E+03 |
| | | 364.48 | | 81.20 | 1.95E+02 | | -4.15E+01 | 9.13E+01 |
| | | 636.97 | | 7.26 | 2.69E+03 | | -3.03E+02 | 1.24E+03 |
| | | 722.89 | | 1.80 | 1.37E+04 | | 9.88E+02 | 6.36E+03 |
| | TE-132 | 49.72 | | 13.10 | 3.54E+08 | 5.41E+07 | 1.55E+07 | 1.69E+08 |
| | | 228.16 | | 88.00 | 5.41E+07 | | 1.47E+07 | 2.59E+07 |
| | BA-133 | 81.00 | | 33.00 | 7.96E-02 | 5.83E-02 | 2.82E-02 | 3.84E-02 |
| | | 302.84 | | 17.80 | 1.74E-01 | | -2.18E-01 | 8.21E-02 |
| | | 356.01 | | 60.00 | 5.83E-02 | | 8.44E-03 | 2.75E-02 |
| | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | XE-133 | 81.00 | | 38.00 | 3.35E+04 | 3.35E+04 | 1.19E+04 | 1.62E+04 |
| | CS-134 | 563.23 | | 8.38 | 4.70E-01 | 4.63E-02 | 2.11E-01 | 2.18E-01 |
| | | 569.32 | | 15.43 | 2.62E-01 | | 3.75E-02 | 1.21E-01 |
| | | 604.70 | | 97.60 | 4.63E-02 | | 3.06E-03 | 2.16E-02 |
| | | 795.84 | | 85.40 | 6.40E-02 | | 1.04E-02 | 2.97E-02 |
| | | 801.93 | | 8.73 | 5.94E-01 | | 8.17E-02 | 2.75E-01 |
| | CS-135 | 268.24 | | 16.00 | 2.22E-01 | 2.22E-01 | -2.40E-03 | 1.06E-01 |
| | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| @ I-135 | 1678.03 | 9.54 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| CS-136 | 153.22 | 7.46 | 7.65E+01 | 8.27E+00 | 1.01E+01 | 3.69E+01 |
| | 163.89 | 4.61 | 1.21E+02 | | 1.01E+01 | 5.84E+01 |
| | 176.55 | 13.56 | 4.22E+01 | | 3.09E+00 | 2.03E+01 |
| | 273.65 | 12.66 | 4.34E+01 | | -7.04E+01 | 2.05E+01 |
| | 340.57 | 48.50 | 1.31E+01 | | -9.35E+00 | 6.18E+00 |
| | 818.50 | 99.70 | 8.27E+00 | | -1.39E+00 | 3.80E+00 |
| | 1048.07 | 79.60 | 1.37E+01 | | 2.05E+00 | 6.35E+00 |
| | 1235.34 | 19.70 | 6.72E+01 | | 2.20E+01 | 3.12E+01 |
| CS-137 | 661.65 | 85.12 | 5.16E-02 | 5.16E-02 | 2.24E-02 | 2.40E-02 |
| LA-138 | 788.74 | 34.00 | 1.43E-01 | 7.15E-02 | 2.13E-02 | 6.65E-02 |
| | 1435.80 | 66.00 | 7.15E-02 | | 1.12E-02 | 3.14E-02 |
| CE-139 | 165.85 | 80.35 | 6.00E-02 | 6.00E-02 | -1.98E-02 | 2.88E-02 |
| BA-140 | 162.64 | 6.70 | 9.75E+01 | 2.88E+01 | 1.44E+01 | 4.70E+01 |
| | 304.84 | 4.50 | 1.52E+02 | | 1.99E+01 | 7.19E+01 |
| | 423.70 | 3.20 | 2.33E+02 | | 9.17E+01 | 1.09E+02 |
| | 437.55 | 2.00 | 3.31E+02 | | -1.86E+02 | 1.53E+02 |
| | 537.32 | 25.00 | 2.88E+01 | | 3.37E+00 | 1.33E+01 |
| LA-140 | 328.77 | 20.50 | 3.78E+01 | 1.18E+01 | 5.88E+00 | 1.79E+01 |
| | 487.03 | 45.50 | 1.65E+01 | | -4.54E-01 | 7.70E+00 |
| | 815.85 | 23.50 | 3.80E+01 | | -5.93E+00 | 1.73E+01 |
| | 1596.49 | 95.49 | 1.18E+01 | | 2.09E+00 | 5.20E+00 |
| CE-141 | 145.44 | 48.40 | 5.25E-01 | 5.25E-01 | 2.02E-01 | 2.54E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 2.75E-01 | 2.75E-01 | -6.80E-03 | 1.32E-01 |
| PM-144 | 476.78 | 42.00 | 1.00E-01 | 4.95E-02 | 6.81E-02 | 4.67E-02 |
| | 618.01 | 98.60 | 4.95E-02 | | 1.29E-03 | 2.30E-02 |
| | 696.49 | 99.49 | 5.44E-02 | | 1.19E-02 | 2.53E-02 |
| PM-145 | 36.85 | 21.70 | 3.63E-01 | 1.87E-01 | 1.27E-01 | 1.75E-01 |
| | 37.36 | 39.70 | 1.87E-01 | | -4.25E-02 | 8.99E-02 |
| | 42.30 | 15.10 | 2.88E-01 | | -6.53E-02 | 1.38E-01 |
| | 72.40 | 2.31 | 1.25E+00 | | -4.73E+00 | 6.03E-01 |
| PM-146 | 453.90 | 39.94 | 8.50E-02 | 8.50E-02 | 3.43E-03 | 3.95E-02 |
| | 735.90 | 14.01 | 2.88E-01 | | 2.67E-04 | 1.32E-01 |
| | 747.13 | 13.10 | 3.43E-01 | | 1.28E-01 | 1.58E-01 |
| ND-147 | 91.11 | 28.90 | 4.79E+01 | 4.79E+01 | -7.42E+01 | 2.31E+01 |
| | 531.02 | 13.10 | 1.35E+02 | | 2.84E+01 | 6.23E+01 |
| PM-149 | 285.90 | 3.10 | 2.97E+13 | 2.97E+13 | -5.76E+12 | 1.40E+13 |
| EU-152 | 121.78 | 20.50 | 1.12E-01 | 1.12E-01 | 4.28E-02 | 5.37E-02 |
| | 244.69 | 5.40 | 6.03E-01 | | -2.92E-01 | 2.88E-01 |
| | 344.27 | 19.13 | 1.61E-01 | | -3.62E-02 | 7.54E-02 |
| | 778.89 | 9.20 | 5.05E-01 | | 1.58E-01 | 2.33E-01 |
| | 964.01 | 10.40 | 5.79E-01 | | -6.07E-01 | 2.69E-01 |
| | 1085.78 | 7.22 | 6.48E-01 | | 2.96E-02 | 2.92E-01 |
| | 1112.02 | 9.60 | 4.97E-01 | | 9.09E-03 | 2.24E-01 |
| | 1407.95 | 14.94 | 3.31E-01 | | -1.38E-01 | 1.46E-01 |
| GD-153 | 97.43 | 31.30 | 9.64E-02 | 9.64E-02 | -1.48E-02 | 4.63E-02 |
| | 103.18 | 22.20 | 1.31E-01 | | -3.64E-02 | 6.29E-02 |
| EU-154 | 123.07 | 40.50 | 5.65E-02 | 5.65E-02 | -1.55E-02 | 2.70E-02 |
| | 723.30 | 19.70 | 2.47E-01 | | 1.79E-02 | 1.15E-01 |
| | 873.19 | 11.50 | 3.98E-01 | | 1.29E-01 | 1.82E-01 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | EU-154 | 996.32 | | 10.30 | 5.01E-01 | 5.65E-02 | -1.53E-01 | 2.30E-01 |
| | | 1004.76 | | 17.90 | 2.87E-01 | | 5.43E-02 | 1.31E-01 |
| | | 1274.45 | | 35.50 | 1.35E-01 | | -9.87E-02 | 6.03E-02 |
| + | EU-155 | 86.50 | * | 30.90 | 9.76E-02 | 9.76E-02 | 7.55E-02 | 4.73E-02 |
| | | 105.30 | | 20.70 | 1.13E-01 | | 1.20E-02 | 5.43E-02 |
| | EU-156 | 811.77 | | 10.40 | 3.52E+01 | 3.52E+01 | -1.02E+01 | 1.60E+01 |
| | | 1153.47 | | 7.20 | 7.47E+01 | | 1.89E+00 | 3.43E+01 |
| | | 1230.71 | | 8.90 | 6.08E+01 | | 6.90E+00 | 2.78E+01 |
| | HO-166M | 184.41 | | 72.60 | 5.32E-02 | 5.32E-02 | 7.65E-02 | 2.58E-02 |
| | | 280.45 | | 29.60 | 1.14E-01 | | 1.30E-04 | 5.45E-02 |
| | | 410.94 | | 11.10 | 3.44E-01 | | 2.18E-01 | 1.63E-01 |
| | | 711.69 | | 54.10 | 7.26E-02 | | -5.84E-03 | 3.33E-02 |
| | TM-171 | 66.72 | | 0.14 | 2.24E+01 | 2.24E+01 | 9.59E+00 | 1.08E+01 |
| | HF-172 | 67.35 | | 5.31 | 5.82E-01 | 2.24E-01 | -6.71E-02 | 2.81E-01 |
| | | 125.81 | | 11.30 | 2.24E-01 | | 1.31E-02 | 1.07E-01 |
| | LU-172 | 181.53 | | 20.60 | 4.51E+03 | 2.55E+03 | -2.66E+01 | 2.17E+03 |
| | | 900.72 | | 29.81 | 4.70E+03 | | 9.32E+02 | 2.16E+03 |
| | | 1093.66 | | 62.50 | 2.55E+03 | | 9.96E+02 | 1.17E+03 |
| | LU-173 | 100.72 | | 5.24 | 4.84E-01 | 1.95E-01 | 9.91E-02 | 2.32E-01 |
| | | 272.11 | | 21.20 | 1.95E-01 | | 2.25E-01 | 9.34E-02 |
| | HF-175 | 343.40 | | 84.00 | 9.56E-02 | 9.56E-02 | -9.62E-03 | 4.48E-02 |
| | LU-176 | 88.34 | | 13.30 | 2.09E-01 | 3.48E-02 | 5.32E-02 | 1.01E-01 |
| | | 201.83 | | 86.00 | 3.77E-02 | | -3.94E-03 | 1.81E-02 |
| | | 306.78 | | 94.00 | 3.48E-02 | | 1.20E-02 | 1.65E-02 |
| | HF-181 | 133.02 | | 41.70 | 2.79E-01 | 1.88E-01 | -7.29E-03 | 1.34E-01 |
| | | 345.85 | | 17.20 | 9.55E-01 | | 1.55E-01 | 4.50E-01 |
| | | 482.03 | | 82.80 | 1.88E-01 | | -9.81E-02 | 8.66E-02 |
| | TA-182 | 67.75 | | 41.20 | 1.23E-01 | 1.23E-01 | -1.42E-02 | 5.95E-02 |
| | | 1121.30 | | 34.90 | 4.31E-01 | | 2.79E-02 | 2.03E-01 |
| | | 1189.05 | | 16.23 | 6.17E-01 | | -6.91E-02 | 2.81E-01 |
| | | 1221.41 | | 26.98 | 4.34E-01 | | 1.90E-01 | 2.00E-01 |
| | | 1231.02 | | 11.44 | 9.34E-01 | | 1.06E-01 | 4.27E-01 |
| | IR-192 | 308.46 | | 29.68 | 2.69E-01 | 1.77E-01 | 9.72E-02 | 1.27E-01 |
| | | 468.07 | | 48.10 | 1.77E-01 | | -2.39E-02 | 8.22E-02 |
| | HG-203 | 279.19 | | 77.30 | 2.05E-01 | 2.05E-01 | 1.74E-01 | 9.78E-02 |
| | TL-204 | 374.74 | | 94.11 | 3.36E-02 | 3.36E-02 | -3.91E-03 | 1.57E-02 |
| | | 899.15 | | 99.16 | 4.75E-02 | | -1.71E-02 | 2.17E-02 |
| | | 911.74 | | 91.10 | 9.27E-02 | | 1.41E-01 | 4.41E-02 |
| | BI-207 | 569.67 | | 97.72 | 3.80E-02 | 3.80E-02 | 5.44E-03 | 1.76E-02 |
| | | 1063.62 | | 74.90 | 6.38E-02 | | -9.99E-03 | 2.89E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 1.71E-01 | 8.17E-02 | 4.82E-01 | 8.11E-02 |
| | | 860.37 | * | 4.48 | 1.35E+00 | | 8.26E-01 | 6.32E-01 |
| | | 2614.66 | * | 35.85 | 8.17E-02 | | 3.66E-01 | 3.01E-02 |
| | BI-210M | 262.00 | | 45.00 | 7.14E-02 | 7.14E-02 | 2.50E-03 | 3.40E-02 |
| | | 300.00 | | 23.00 | 1.49E-01 | | 8.14E-02 | 7.08E-02 |
| | PB-210 | 46.50 | | 4.25 | 9.72E-01 | 9.72E-01 | 8.16E-01 | 4.67E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.13E+00 | 1.13E+00 | -8.28E-01 | 5.28E-01 |
| | | 831.96 | | 2.90 | 1.62E+00 | | -1.15E-01 | 7.46E-01 |
| + | BI-212 | 727.17 | * | 11.80 | 4.71E-01 | 4.71E-01 | 3.52E-01 | 2.22E-01 |
| | | 1620.62 | | 2.75 | 1.96E+00 | | 7.44E-01 | 8.67E-01 |
| + | PB-212 | 238.63 | * | 44.60 | 1.46E-01 | 1.46E-01 | 5.75E-01 | 7.12E-02 |
| | | 300.09 | | 3.41 | 1.00E+00 | | 5.49E-01 | 4.78E-01 |
| + | BI-214 | 609.31 | * | 46.30 | 1.31E-01 | 1.31E-01 | 4.95E-01 | 6.26E-02 |

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BI-214 | 1120.29 | * | 15.10 | 5.53E-01 | 1.31E-01 | 6.28E-01 | 2.61E-01 |
| | | 1764.49 | * | 15.80 | 3.72E-01 | | 6.62E-01 | 1.65E-01 |
| | | 2204.22 | * | 4.98 | 1.23E+00 | | 6.95E-01 | 5.41E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 2.02E-01 | 1.58E-01 | 5.25E-01 | 9.67E-02 |
| | | 351.92 | * | 37.19 | 1.58E-01 | | 6.07E-01 | 7.66E-02 |
| | RN-219 | 401.80 | | 6.50 | 4.88E-01 | 4.88E-01 | -7.18E-03 | 2.28E-01 |
| | RA-223 | 323.87 | | 3.88 | 7.64E-01 | 7.64E-01 | -6.87E-01 | 3.59E-01 |
| | RA-224 | 240.98 | | 3.95 | 1.52E+00 | 1.52E+00 | 3.53E+00 | 7.43E-01 |
| | RA-225 | 40.00 | | 31.00 | 1.99E+01 | 1.99E+01 | 6.47E+00 | 9.59E+00 |
| + | RA-226 | 186.21 | * | 3.28 | 1.25E+00 | 1.25E+00 | 7.74E-01 | 6.04E-01 |
| | TH-227 | 50.10 | | 8.40 | 3.76E-01 | 3.76E-01 | 1.64E-02 | 1.80E-01 |
| | | 236.00 | | 11.50 | 3.82E-01 | | -2.21E+00 | 1.85E-01 |
| | | 256.20 | | 6.30 | 5.36E-01 | | -5.35E-02 | 2.56E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 4.21E-01 | 2.21E-01 | 4.84E-01 | 2.02E-01 |
| | | 911.07 | * | 27.70 | 2.21E-01 | | 4.46E-01 | 1.03E-01 |
| | | 969.11 | | 16.60 | 4.65E-01 | | 5.01E-01 | 2.20E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.02E-01 | 2.02E-01 | -7.77E-02 | 9.66E-02 |
| | | 62.85 | | 4.60 | 7.09E-01 | | 5.18E-01 | 3.43E-01 |
| | | 67.67 | | 0.37 | 7.54E+00 | | -8.69E-01 | 3.64E+00 |
| | PA-231 | 283.67 | | 1.60 | 1.94E+00 | 1.32E+00 | -7.89E-01 | 9.19E-01 |
| | | 302.67 | | 2.30 | 1.32E+00 | | -1.66E+00 | 6.24E-01 |
| | TH-231 | 25.64 | | 14.70 | 9.44E-02 | 9.44E-02 | 0.00E+00 | 0.00E+00 |
| | | 84.21 | | 6.40 | 4.04E-01 | | 2.57E-01 | 1.95E-01 |
| | PA-233 | 311.98 | | 38.60 | 9.26E-01 | 9.26E-01 | -8.10E-01 | 4.35E-01 |
| | PA-234 | 131.20 | | 20.40 | 1.17E-01 | 1.17E-01 | -1.64E-02 | 5.62E-02 |
| | | 733.99 | | 8.80 | 4.15E-01 | | -9.92E-02 | 1.89E-01 |
| | | 946.00 | | 12.00 | 3.94E-01 | | -2.76E-02 | 1.80E-01 |
| | PA-234M | 1001.03 | | 0.92 | 5.32E+00 | 5.32E+00 | -6.24E-01 | 2.43E+00 |
| | TH-234 | 63.29 | | 3.80 | 8.75E-01 | 8.75E-01 | 1.10E+00 | 4.24E-01 |
| | U-235 | 143.76 | | 10.50 | 2.97E-01 | 2.97E-01 | 1.84E-01 | 1.44E-01 |
| | | 163.35 | | 4.70 | 6.40E-01 | | 5.31E-02 | 3.08E-01 |
| | | 205.31 | | 4.70 | 7.12E-01 | | 3.05E-01 | 3.42E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 2.31E-01 | 2.31E-01 | 1.78E-01 | 1.12E-01 |
| | NP-239 | 106.10 | | 22.70 | 4.71E+11 | 4.71E+11 | 5.01E+10 | 2.26E+11 |
| | | 228.18 | | 10.70 | 1.45E+12 | | 3.95E+11 | 6.96E+11 |
| | | 277.60 | | 14.10 | 1.12E+12 | | -5.47E+11 | 5.31E+11 |
| | AM-241 | 59.54 | | 35.90 | 8.51E-02 | 8.51E-02 | 3.04E-02 | 4.10E-02 |
| | AM-243 | 74.67 | | 66.00 | 5.57E-02 | 5.57E-02 | -8.47E-02 | 2.72E-02 |
| | CM-243 | 209.75 | | 3.29 | 1.04E+00 | 2.39E-01 | 4.99E-01 | 4.98E-01 |
| | | 228.14 | | 10.60 | 3.12E-01 | | 8.49E-02 | 1.49E-01 |
| | | 277.60 | | 14.00 | 2.39E-01 | | -1.17E-01 | 1.14E-01 |

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

Analysis Report for 1707087-05

HTC-A03-S002-0612-01

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-0612-01

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 1 | 39 | 78 | 117 | 107 |
| 33: | 320 | 547 | 77 | 80 | 68 | 98 | 71 | 87 |
| 41: | 72 | 54 | 51 | 53 | 50 | 68 | 86 | 64 |
| 49: | 54 | 56 | 57 | 50 | 62 | 78 | 54 | 67 |
| 57: | 54 | 74 | 95 | 77 | 75 | 73 | 121 | 119 |
| 65: | 89 | 73 | 90 | 95 | 67 | 93 | 93 | 90 |
| 73: | 97 | 97 | 251 | 144 | 287 | 192 | 77 | 80 |
| 81: | 83 | 85 | 72 | 98 | 87 | 67 | 131 | 128 |
| 89: | 65 | 102 | 74 | 91 | 160 | 90 | 71 | 66 |
| 97: | 78 | 66 | 48 | 68 | 55 | 57 | 59 | 59 |
| 105: | 69 | 63 | 52 | 59 | 48 | 65 | 57 | 68 |
| 113: | 64 | 55 | 47 | 56 | 63 | 69 | 56 | 44 |
| 121: | 57 | 52 | 61 | 51 | 62 | 54 | 53 | 57 |
| 129: | 73 | 70 | 61 | 47 | 58 | 57 | 51 | 60 |
| 137: | 58 | 51 | 58 | 56 | 50 | 48 | 58 | 72 |
| 145: | 54 | 50 | 44 | 49 | 42 | 48 | 45 | 57 |
| 153: | 44 | 46 | 64 | 50 | 45 | 39 | 56 | 47 |
| 161: | 46 | 45 | 46 | 45 | 49 | 42 | 43 | 31 |
| 169: | 47 | 47 | 34 | 41 | 35 | 46 | 45 | 47 |
| 177: | 37 | 47 | 41 | 40 | 54 | 48 | 51 | 42 |
| 185: | 58 | 113 | 63 | 34 | 49 | 51 | 40 | 35 |
| 193: | 47 | 40 | 37 | 35 | 39 | 40 | 40 | 44 |
| 201: | 39 | 42 | 40 | 37 | 43 | 46 | 45 | 32 |
| 209: | 55 | 52 | 33 | 38 | 29 | 42 | 26 | 37 |
| 217: | 42 | 46 | 34 | 33 | 43 | 36 | 20 | 30 |
| 225: | 29 | 47 | 29 | 36 | 25 | 38 | 33 | 33 |
| 233: | 44 | 30 | 34 | 37 | 28 | 176 | 321 | 46 |
| 241: | 69 | 81 | 49 | 28 | 22 | 25 | 27 | 23 |
| 249: | 24 | 21 | 30 | 33 | 27 | 35 | 29 | 39 |
| 257: | 28 | 26 | 36 | 29 | 25 | 26 | 31 | 26 |
| 265: | 21 | 33 | 30 | 29 | 22 | 50 | 42 | 26 |
| 273: | 21 | 26 | 17 | 18 | 36 | 33 | 23 | 25 |
| 281: | 43 | 24 | 23 | 24 | 25 | 17 | 17 | 16 |
| 289: | 21 | 25 | 28 | 22 | 19 | 32 | 116 | 91 |
| 297: | 25 | 19 | 30 | 38 | 24 | 17 | 20 | 17 |
| 305: | 20 | 28 | 21 | 22 | 21 | 20 | 19 | 10 |
| 313: | 11 | 19 | 25 | 22 | 18 | 18 | 24 | 13 |
| 321: | 21 | 20 | 23 | 13 | 18 | 10 | 27 | 32 |
| 329: | 26 | 18 | 20 | 30 | 17 | 25 | 21 | 20 |
| 337: | 26 | 58 | 49 | 14 | 15 | 18 | 9 | 18 |
| 345: | 19 | 16 | 18 | 21 | 28 | 18 | 89 | 210 |
| 353: | 67 | 18 | 23 | 16 | 19 | 23 | 18 | 14 |
| 361: | 18 | 16 | 14 | 11 | 16 | 18 | 16 | 14 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 8 | 11 | 15 | 19 | 17 | 17 | 9 | 11 |

Sample Title: HTC-A03-S002-0612-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 15 | 18 | 10 | 12 | 16 | 10 | 18 | 10 |
| 385: | 15 | 14 | 16 | 17 | 26 | 14 | 21 | 21 |
| 393: | 12 | 12 | 19 | 11 | 17 | 18 | 15 | 8 |
| 401: | 10 | 22 | 11 | 18 | 13 | 16 | 15 | 20 |
| 409: | 29 | 16 | 20 | 14 | 20 | 10 | 13 | 17 |
| 417: | 15 | 13 | 22 | 17 | 18 | 18 | 11 | 20 |
| 425: | 15 | 12 | 8 | 18 | 16 | 7 | 15 | 10 |
| 433: | 19 | 12 | 9 | 11 | 14 | 7 | 15 | 18 |
| 441: | 15 | 16 | 9 | 5 | 15 | 12 | 12 | 15 |
| 449: | 9 | 10 | 8 | 9 | 13 | 16 | 8 | 15 |
| 457: | 17 | 11 | 10 | 16 | 11 | 23 | 36 | 20 |
| 465: | 13 | 11 | 14 | 9 | 15 | 12 | 16 | 6 |
| 473: | 8 | 9 | 12 | 12 | 8 | 16 | 16 | 7 |
| 481: | 6 | 13 | 12 | 10 | 9 | 13 | 9 | 12 |
| 489: | 19 | 9 | 19 | 13 | 12 | 10 | 9 | 11 |
| 497: | 10 | 10 | 14 | 11 | 11 | 11 | 15 | 10 |
| 505: | 8 | 15 | 12 | 8 | 20 | 54 | 52 | 35 |
| 513: | 21 | 5 | 10 | 11 | 7 | 9 | 8 | 10 |
| 521: | 10 | 14 | 9 | 10 | 10 | 9 | 7 | 10 |
| 529: | 5 | 10 | 10 | 14 | 11 | 9 | 8 | 9 |
| 537: | 13 | 13 | 5 | 11 | 5 | 12 | 13 | 10 |
| 545: | 9 | 8 | 12 | 5 | 11 | 11 | 4 | 4 |
| 553: | 10 | 17 | 9 | 14 | 4 | 10 | 3 | 13 |
| 561: | 9 | 10 | 9 | 13 | 11 | 7 | 6 | 6 |
| 569: | 9 | 20 | 13 | 12 | 9 | 10 | 6 | 6 |
| 577: | 10 | 8 | 7 | 9 | 12 | 35 | 67 | 46 |
| 585: | 15 | 16 | 4 | 9 | 6 | 10 | 7 | 7 |
| 593: | 14 | 12 | 8 | 9 | 10 | 7 | 11 | 10 |
| 601: | 8 | 8 | 9 | 10 | 7 | 6 | 14 | 43 |
| 609: | 135 | 76 | 11 | 8 | 9 | 10 | 10 | 11 |
| 617: | 7 | 6 | 7 | 7 | 9 | 7 | 7 | 12 |
| 625: | 10 | 11 | 8 | 9 | 6 | 13 | 9 | 10 |
| 633: | 9 | 4 | 5 | 5 | 8 | 8 | 7 | 10 |
| 641: | 5 | 5 | 3 | 6 | 13 | 11 | 7 | 3 |
| 649: | 9 | 9 | 6 | 4 | 2 | 4 | 9 | 4 |
| 657: | 6 | 10 | 4 | 8 | 18 | 7 | 6 | 7 |
| 665: | 11 | 3 | 12 | 2 | 12 | 2 | 10 | 6 |
| 673: | 3 | 10 | 7 | 11 | 8 | 7 | 2 | 9 |
| 681: | 6 | 6 | 7 | 10 | 11 | 8 | 6 | 12 |
| 689: | 9 | 6 | 7 | 6 | 9 | 10 | 8 | 8 |
| 697: | 8 | 9 | 6 | 8 | 7 | 6 | 5 | 5 |
| 705: | 6 | 6 | 10 | 4 | 7 | 4 | 7 | 8 |
| 713: | 5 | 7 | 4 | 6 | 5 | 5 | 9 | 7 |
| 721: | 6 | 4 | 5 | 7 | 12 | 21 | 15 | 9 |
| 729: | 6 | 6 | 3 | 5 | 14 | 7 | 1 | 1 |
| 737: | 3 | 7 | 6 | 4 | 5 | 3 | 7 | 7 |
| 745: | 7 | 6 | 7 | 6 | 5 | 10 | 4 | 6 |
| 753: | 8 | 8 | 7 | 6 | 4 | 8 | 9 | 4 |
| 761: | 5 | 4 | 9 | 7 | 8 | 7 | 12 | 22 |
| 769: | 14 | 8 | 4 | 13 | 6 | 6 | 3 | 8 |
| 777: | 7 | 10 | 7 | 8 | 7 | 7 | 7 | 5 |
| 785: | 12 | 6 | 6 | 7 | 12 | 9 | 4 | 10 |
| 793: | 6 | 8 | 15 | 7 | 5 | 7 | 10 | 6 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 6 | 7 | 8 | 7 | 8 | 6 | 5 | 6 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 5 | 4 | 5 | 6 | 3 | 5 | 11 | 2 |
| 817: | 8 | 2 | 6 | 8 | 6 | 8 | 10 | 11 |
| 825: | 7 | 8 | 2 | 3 | 5 | 8 | 9 | 5 |
| 833: | 11 | 6 | 11 | 7 | 6 | 9 | 6 | 7 |
| 841: | 6 | 9 | 5 | 2 | 6 | 8 | 4 | 6 |
| 849: | 4 | 8 | 6 | 4 | 3 | 6 | 5 | 3 |
| 857: | 6 | 6 | 10 | 13 | 7 | 4 | 3 | 6 |
| 865: | 2 | 2 | 6 | 2 | 4 | 6 | 6 | 1 |
| 873: | 7 | 8 | 5 | 6 | 5 | 5 | 9 | 4 |
| 881: | 5 | 5 | 7 | 3 | 6 | 4 | 7 | 3 |
| 889: | 6 | 11 | 3 | 6 | 2 | 5 | 2 | 3 |
| 897: | 7 | 7 | 4 | 5 | 6 | 5 | 11 | 8 |
| 905: | 8 | 8 | 6 | 4 | 12 | 23 | 63 | 21 |
| 913: | 2 | 1 | 8 | 3 | 5 | 7 | 4 | 4 |
| 921: | 8 | 6 | 5 | 3 | 1 | 3 | 7 | 4 |
| 929: | 5 | 3 | 5 | 7 | 7 | 3 | 3 | 4 |
| 937: | 1 | 3 | 2 | 7 | 4 | 3 | 1 | 9 |
| 945: | 7 | 3 | 5 | 10 | 6 | 6 | 7 | 7 |
| 953: | 7 | 2 | 2 | 6 | 6 | 4 | 8 | 4 |
| 961: | 5 | 7 | 8 | 14 | 12 | 10 | 14 | 33 |
| 969: | 27 | 12 | 3 | 5 | 3 | 5 | 4 | 4 |
| 977: | 6 | 2 | 5 | 4 | 7 | 3 | 5 | 3 |
| 985: | 6 | 4 | 5 | 7 | 5 | 3 | 8 | 8 |
| 993: | 6 | 6 | 6 | 5 | 8 | 4 | 5 | 5 |
| 1001: | 8 | 2 | 5 | 7 | 5 | 8 | 4 | 6 |
| 1009: | 3 | 5 | 6 | 6 | 3 | 3 | 4 | 4 |
| 1017: | 3 | 6 | 6 | 5 | 3 | 4 | 6 | 3 |
| 1025: | 3 | 6 | 3 | 4 | 8 | 7 | 5 | 1 |
| 1033: | 9 | 4 | 7 | 4 | 2 | 3 | 4 | 3 |
| 1041: | 7 | 8 | 4 | 5 | 3 | 10 | 8 | 7 |
| 1049: | 11 | 7 | 8 | 6 | 5 | 2 | 6 | 5 |
| 1057: | 5 | 4 | 4 | 5 | 4 | 3 | 5 | 2 |
| 1065: | 4 | 8 | 9 | 3 | 5 | 6 | 6 | 3 |
| 1073: | 10 | 6 | 7 | 7 | 4 | 5 | 5 | 5 |
| 1081: | 3 | 4 | 3 | 6 | 3 | 1 | 6 | 5 |
| 1089: | 5 | 3 | 6 | 9 | 7 | 7 | 3 | 7 |
| 1097: | 2 | 5 | 1 | 6 | 4 | 1 | 6 | 5 |
| 1105: | 5 | 5 | 5 | 6 | 2 | 4 | 4 | 5 |
| 1113: | 2 | 5 | 9 | 11 | 4 | 16 | 21 | 30 |
| 1121: | 12 | 1 | 7 | 6 | 4 | 5 | 7 | 5 |
| 1129: | 2 | 2 | 7 | 9 | 2 | 7 | 5 | 8 |
| 1137: | 7 | 8 | 5 | 5 | 6 | 3 | 1 | 2 |
| 1145: | 4 | 5 | 5 | 10 | 7 | 5 | 4 | 6 |
| 1153: | 6 | 6 | 8 | 7 | 4 | 3 | 4 | 3 |
| 1161: | 0 | 2 | 7 | 6 | 5 | 4 | 8 | 4 |
| 1169: | 9 | 11 | 2 | 7 | 4 | 7 | 10 | 4 |
| 1177: | 6 | 7 | 7 | 9 | 8 | 6 | 3 | 4 |
| 1185: | 9 | 4 | 5 | 5 | 8 | 2 | 2 | 10 |
| 1193: | 3 | 3 | 4 | 9 | 4 | 3 | 3 | 3 |
| 1201: | 3 | 1 | 1 | 5 | 9 | 7 | 7 | 8 |
| 1209: | 9 | 5 | 3 | 7 | 5 | 13 | 5 | 5 |
| 1217: | 7 | 6 | 8 | 9 | 6 | 4 | 6 | 8 |
| 1225: | 5 | 2 | 9 | 2 | 3 | 8 | 5 | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 8 | 6 | 6 | 8 | 9 | 18 | 4 | 9 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 6 | 6 | 7 | 7 | 6 | 3 | 8 | 7 |
| 1249: | 8 | 7 | 7 | 4 | 6 | 5 | 6 | 4 |
| 1257: | 4 | 4 | 4 | 2 | 2 | 6 | 1 | 2 |
| 1265: | 3 | 1 | 5 | 3 | 3 | 5 | 1 | 3 |
| 1273: | 5 | 5 | 4 | 1 | 3 | 4 | 10 | 2 |
| 1281: | 3 | 5 | 2 | 6 | 2 | 1 | 1 | 6 |
| 1289: | 1 | 6 | 1 | 3 | 1 | 2 | 3 | 3 |
| 1297: | 3 | 1 | 2 | 2 | 4 | 5 | 2 | 2 |
| 1305: | 6 | 1 | 1 | 2 | 7 | 2 | 3 | 2 |
| 1313: | 5 | 1 | 2 | 1 | 2 | 0 | 3 | 5 |
| 1321: | 3 | 4 | 3 | 2 | 1 | 3 | 3 | 3 |
| 1329: | 6 | 3 | 1 | 2 | 4 | 3 | 4 | 1 |
| 1337: | 1 | 2 | 3 | 5 | 3 | 3 | 4 | 2 |
| 1345: | 4 | 2 | 0 | 2 | 1 | 2 | 0 | 0 |
| 1353: | 1 | 3 | 2 | 0 | 2 | 3 | 1 | 0 |
| 1361: | 2 | 2 | 2 | 3 | 1 | 3 | 1 | 2 |
| 1369: | 2 | 1 | 3 | 4 | 1 | 5 | 2 | 8 |
| 1377: | 6 | 6 | 0 | 4 | 3 | 3 | 4 | 8 |
| 1385: | 1 | 4 | 3 | 3 | 2 | 1 | 1 | 3 |
| 1393: | 0 | 3 | 0 | 7 | 2 | 1 | 4 | 0 |
| 1401: | 7 | 5 | 2 | 1 | 1 | 2 | 2 | 4 |
| 1409: | 3 | 3 | 2 | 0 | 1 | 2 | 2 | 4 |
| 1417: | 1 | 3 | 1 | 2 | 2 | 2 | 2 | 0 |
| 1425: | 0 | 2 | 5 | 1 | 1 | 2 | 3 | 6 |
| 1433: | 3 | 0 | 2 | 1 | 1 | 1 | 1 | 0 |
| 1441: | 0 | 2 | 1 | 2 | 2 | 0 | 2 | 2 |
| 1449: | 3 | 4 | 3 | 0 | 2 | 1 | 2 | 5 |
| 1457: | 12 | 26 | 87 | 180 | 132 | 27 | 3 | 2 |
| 1465: | 1 | 1 | 5 | 0 | 4 | 1 | 3 | 0 |
| 1473: | 2 | 1 | 0 | 0 | 2 | 0 | 4 | 0 |
| 1481: | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 |
| 1489: | 1 | 2 | 1 | 2 | 1 | 3 | 1 | 3 |
| 1497: | 2 | 0 | 3 | 3 | 4 | 2 | 3 | 1 |
| 1505: | 1 | 3 | 3 | 4 | 4 | 1 | 1 | 2 |
| 1513: | 4 | 5 | 2 | 1 | 2 | 0 | 2 | 1 |
| 1521: | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 2 |
| 1529: | 3 | 0 | 1 | 1 | 0 | 3 | 2 | 1 |
| 1537: | 1 | 4 | 1 | 0 | 0 | 3 | 1 | 1 |
| 1545: | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 4 |
| 1553: | 3 | 2 | 0 | 0 | 1 | 2 | 0 | 0 |
| 1561: | 3 | 1 | 4 | 3 | 2 | 0 | 2 | 2 |
| 1569: | 1 | 0 | 4 | 2 | 1 | 0 | 0 | 1 |
| 1577: | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| 1585: | 4 | 0 | 3 | 3 | 3 | 2 | 2 | 2 |
| 1593: | 1 | 3 | 3 | 2 | 3 | 2 | 1 | 0 |
| 1601: | 2 | 0 | 1 | 2 | 2 | 1 | 2 | 1 |
| 1609: | 1 | 2 | 1 | 0 | 2 | 1 | 2 | 2 |
| 1617: | 3 | 0 | 4 | 0 | 5 | 3 | 1 | 1 |
| 1625: | 1 | 1 | 1 | 1 | 6 | 0 | 2 | 2 |
| 1633: | 0 | 1 | 1 | 3 | 1 | 1 | 2 | 1 |
| 1641: | 1 | 1 | 0 | 2 | 0 | 2 | 1 | 2 |
| 1649: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 1657: | 1 | 0 | 3 | 5 | 0 | 1 | 0 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 2 | 2 | 0 | 1 | 2 | 0 | 1 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 2 |
| 1681: | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 1689: | 3 | 1 | 0 | 2 | 2 | 0 | 0 | 1 |
| 1697: | 2 | 0 | 0 | 0 | 1 | 2 | 1 | 1 |
| 1705: | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| 1713: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1721: | 0 | 0 | 2 | 0 | 1 | 1 | 2 | 6 |
| 1729: | 4 | 4 | 0 | 1 | 0 | 0 | 3 | 1 |
| 1737: | 1 | 2 | 2 | 1 | 2 | 1 | 0 | 0 |
| 1745: | 3 | 0 | 2 | 1 | 0 | 2 | 1 | 0 |
| 1753: | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| 1761: | 2 | 9 | 17 | 21 | 7 | 2 | 2 | 0 |
| 1769: | 5 | 1 | 2 | 1 | 0 | 0 | 2 | 0 |
| 1777: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 1785: | 1 | 2 | 0 | 1 | 2 | 1 | 1 | 1 |
| 1793: | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 1 |
| 1801: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1809: | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| 1817: | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 1 |
| 1825: | 2 | 2 | 1 | 2 | 1 | 2 | 0 | 1 |
| 1833: | 0 | 2 | 1 | 0 | 1 | 0 | 4 | 3 |
| 1841: | 0 | 2 | 1 | 2 | 3 | 3 | 0 | 1 |
| 1849: | 3 | 1 | 2 | 0 | 2 | 0 | 1 | 0 |
| 1857: | 2 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 1865: | 0 | 2 | 0 | 0 | 1 | 0 | 2 | 1 |
| 1873: | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 1881: | 0 | 1 | 2 | 2 | 0 | 1 | 0 | 1 |
| 1889: | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| 1897: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 1905: | 2 | 0 | 1 | 2 | 1 | 1 | 2 | 0 |
| 1913: | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 |
| 1921: | 0 | 2 | 0 | 0 | 1 | 2 | 0 | 1 |
| 1929: | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 4 |
| 1937: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1945: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| 1953: | 0 | 1 | 1 | 2 | 0 | 2 | 2 | 0 |
| 1961: | 2 | 1 | 1 | 0 | 1 | 2 | 1 | 0 |
| 1969: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 1977: | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 1 |
| 1985: | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 0 |
| 1993: | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 0 |
| 2001: | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 2009: | 1 | 2 | 1 | 1 | 0 | 3 | 0 | 0 |
| 2017: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| 2025: | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 |
| 2033: | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 2041: | 2 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 2049: | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 0 |
| 2057: | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 0 |
| 2065: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 2073: | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 2081: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2089: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 0 | 0 | 0 | 0 | 2 | 2 | 3 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 0 | 0 | 1 | 2 | 2 | 0 | 1 | 0 |
| 2113: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 2121: | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| 2129: | 1 | 2 | 0 | 1 | 0 | 0 | 2 | 1 |
| 2137: | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 2145: | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 2153: | 0 | 2 | 1 | 0 | 0 | 0 | 2 | 0 |
| 2161: | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 1 |
| 2169: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 2177: | 1 | 2 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2185: | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2193: | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 2201: | 3 | 3 | 5 | 2 | 4 | 1 | 1 | 0 |
| 2209: | 3 | 1 | 0 | 1 | 2 | 0 | 0 | 0 |
| 2217: | 2 | 1 | 0 | 0 | 1 | 0 | 2 | 0 |
| 2225: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2233: | 0 | 2 | 1 | 2 | 1 | 1 | 0 | 1 |
| 2241: | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 1 |
| 2249: | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2257: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 1 |
| 2265: | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| 2273: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2281: | 1 | 1 | 0 | 2 | 0 | 0 | 2 | 0 |
| 2289: | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 2 |
| 2297: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2305: | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 |
| 2313: | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 2321: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2329: | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 0 |
| 2337: | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2345: | 1 | 0 | 2 | 1 | 0 | 1 | 1 | 0 |
| 2353: | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2361: | 0 | 1 | 0 | 1 | 1 | 2 | 1 | 0 |
| 2369: | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 1 |
| 2377: | 1 | 1 | 1 | 0 | 0 | 0 | 3 | 0 |
| 2385: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2393: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 |
| 2401: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2409: | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 1 |
| 2417: | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| 2425: | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 0 |
| 2433: | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 2 |
| 2441: | 0 | 0 | 1 | 1 | 1 | 4 | 1 | 0 |
| 2449: | 0 | 0 | 2 | 2 | 1 | 1 | 0 | 0 |
| 2457: | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 2465: | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 3 |
| 2473: | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2489: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2497: | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2505: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2545: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2553: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2561: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2569: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2585: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2593: | 3 | 0 | 2 | 0 | 1 | 0 | 0 | 1 |
| 2601: | 1 | 0 | 2 | 0 | 1 | 2 | 0 | 0 |
| 2609: | 2 | 4 | 3 | 11 | 15 | 12 | 3 | 1 |
| 2617: | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2633: | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2689: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2697: | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2705: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2713: | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2721: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2729: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2737: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2745: | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| 2753: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2761: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2793: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2801: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2809: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2817: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2825: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2841: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2865: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2873: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2881: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2889: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2897: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2913: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2921: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2929: | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2945: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2953: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2985: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3009: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3017: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3041: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3049: | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3057: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3089: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3105: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3121: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3161: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3169: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3185: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3193: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3201: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3233: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3257: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3321: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 3353: | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3385: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-0612-01

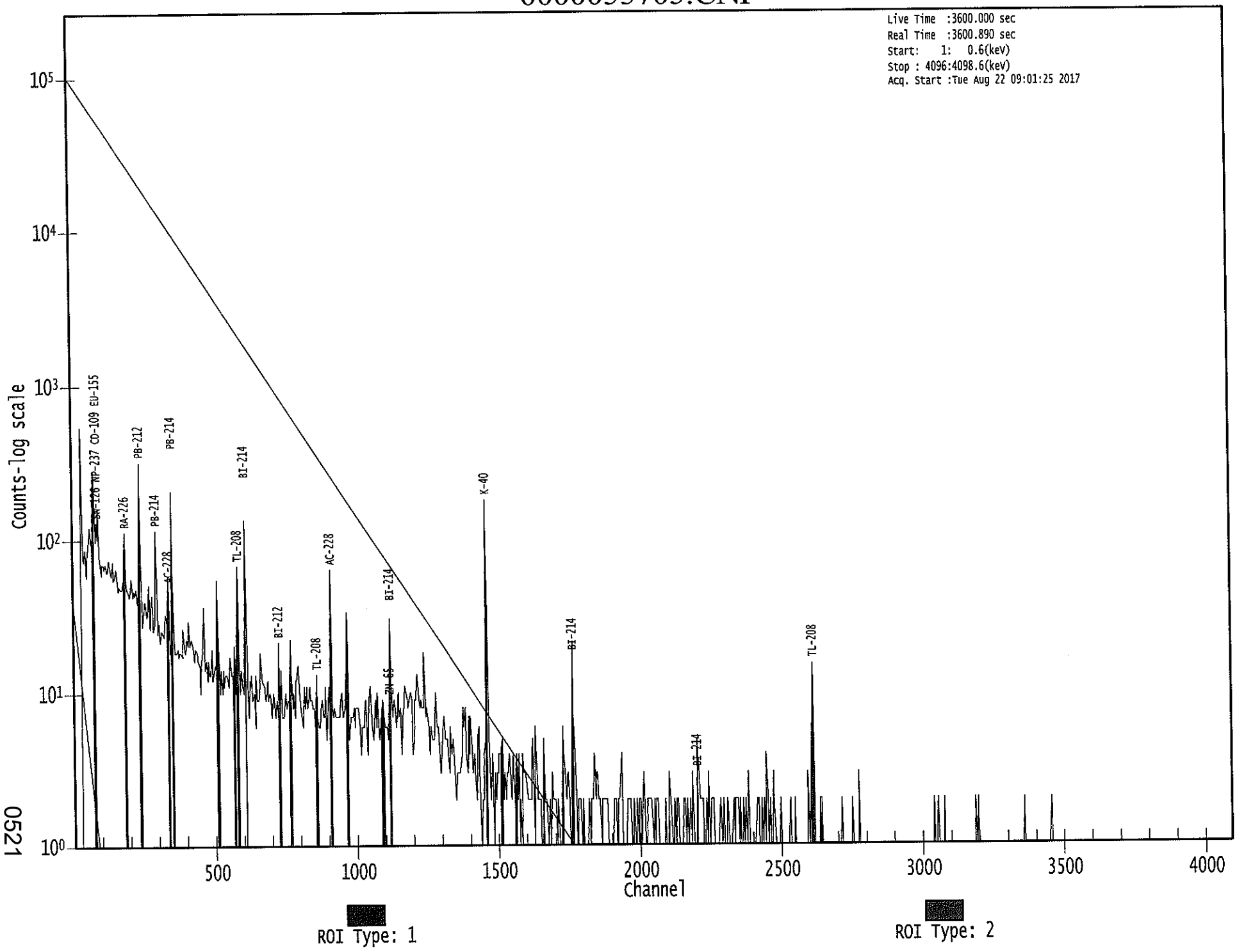
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3409: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3449: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3585: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3609: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3617: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3641: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3745: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3753: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3761: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-0612-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3841: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3961: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4001: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# 0000055705.CNF




0521

Apex-Gamma

8/22

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-06 |
| Sample Description | : HTC-A03-S002-1218-01 |
| Sample Type | : SOIL |
| Sample Size | : 7.733E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:42:28AM |
| Acquisition Started | : 8/22/2017 9:01:34AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE3 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3608.2 seconds |
| Dead Time | : 0.23 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 9 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55706 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 10:02:15AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 32.21 | 32.53 | 0.0000 | 0.00 |
| 2 | 76.49 | 76.80 | 0.0000 | 0.00 |
| 3 | 86.45 | 86.75 | 0.0000 | 0.00 |
| 4 | 92.96 | 93.25 | 0.0000 | 0.00 |
| 5 | 98.94 | 99.24 | 0.0000 | 0.00 |
| 6 | 130.10 | 130.38 | 0.0000 | 0.00 |
| 7 | 186.16 | 186.43 | 0.0000 | 0.00 |
| 8 | 238.96 | 239.20 | 0.0000 | 0.00 |
| 9 | 242.15 | 242.39 | 0.0000 | 0.00 |
| 10 | 271.08 | 271.32 | 0.0000 | 0.00 |
| 11 | 295.38 | 295.61 | 0.0000 | 0.00 |
| 12 | 338.75 | 338.97 | 0.0000 | 0.00 |
| 13 | 352.35 | 352.56 | 0.0000 | 0.00 |
| 14 | 463.19 | 463.37 | 0.0000 | 0.00 |
| 15 | 502.08 | 502.24 | 0.0000 | 0.00 |
| 16 | 507.69 | 507.85 | 0.0000 | 0.00 |
| 17 | 511.42 | 511.57 | 0.0000 | 0.00 |
| 18 | 583.28 | 583.41 | 0.0000 | 0.00 |
| 19 | 604.88 | 605.00 | 0.0000 | 0.00 |
| 20 | 609.49 | 609.61 | 0.0000 | 0.00 |
| 21 | 675.23 | 675.33 | 0.0000 | 0.00 |
| 22 | 727.49 | 727.57 | 0.0000 | 0.00 |
| 23 | 768.97 | 769.03 | 0.0000 | 0.00 |
| 24 | 794.82 | 794.88 | 0.0000 | 0.00 |
| 25 | 834.90 | 834.95 | 0.0000 | 0.00 |
| 26 | 842.21 | 842.25 | 0.0000 | 0.00 |
| 27 | 859.17 | 859.21 | 0.0000 | 0.00 |
| 28 | 872.36 | 872.39 | 0.0000 | 0.00 |
| 29 | 911.11 | 911.13 | 0.0000 | 0.00 |
| 30 | 969.03 | 969.03 | 0.0000 | 0.00 |
| 31 | 1016.81 | 1016.80 | 0.0000 | 0.00 |
| 32 | 1088.78 | 1088.74 | 0.0000 | 0.00 |
| 33 | 1120.52 | 1120.47 | 0.0000 | 0.00 |
| 34 | 1194.26 | 1194.19 | 0.0000 | 0.00 |
| 35 | 1240.80 | 1240.71 | 0.0000 | 0.00 |
| 36 | 1386.28 | 1386.14 | 0.0000 | 0.00 |
| 37 | 1460.82 | 1460.66 | 0.0000 | 0.00 |
| 38 | 1508.53 | 1508.35 | 0.0000 | 0.00 |
| 39 | 1517.59 | 1517.40 | 0.0000 | 0.00 |
| 40 | 1551.72 | 1551.53 | 0.0000 | 0.00 |
| 41 | 1564.00 | 1563.80 | 0.0000 | 0.00 |
| 42 | 1729.21 | 1728.95 | 0.0000 | 0.00 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1764.52 | 1764.25 | 0.0000 | 0.00 |
| 44 | 1976.43 | 1976.09 | 0.0000 | 0.00 |
| 45 | 2176.58 | 2176.17 | 0.0000 | 0.00 |
| 46 | 2205.16 | 2204.75 | 0.0000 | 0.00 |
| 47 | 2302.68 | 2302.23 | 0.0000 | 0.00 |
| 48 | 2558.20 | 2557.67 | 0.0000 | 0.00 |
| 49 | 2614.61 | 2614.05 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 10:02:15AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 32.21 | 31 - | 35 | 32.53 | 5.09E+01 | 61.71 | 7.96E+02 | 1.76 |
| | 2 | 76.49 | 72 - | 80 | 76.80 | 1.04E+03 | 144.83 | 2.58E+03 | 2.52 |
| | 3 | 86.45 | 83 - | 90 | 86.75 | 1.08E+02 | 118.03 | 2.26E+03 | 3.72 |
| | 4 | 92.96 | 90 - | 96 | 93.25 | 2.96E+02 | 102.18 | 1.65E+03 | 2.04 |
| | 5 | 98.94 | 97 - | 102 | 99.24 | 6.89E+01 | 76.56 | 1.11E+03 | 3.40 |
| | 6 | 130.10 | 127 - | 133 | 130.38 | 1.11E+02 | 79.17 | 1.06E+03 | 3.00 |
| | 7 | 186.16 | 183 - | 189 | 186.43 | 2.26E+02 | 74.19 | 8.36E+02 | 2.23 |
| M | 8 | 238.96 | 234 - | 246 | 239.20 | 6.50E+02 | 73.77 | 5.51E+02 | 2.16 |
| m | 9 | 242.15 | 234 - | 246 | 242.39 | 2.25E+02 | 79.98 | 6.21E+02 | 2.50 |
| | 10 | 271.08 | 268 - | 275 | 271.32 | 7.45E+01 | 59.73 | 5.47E+02 | 2.67 |
| | 11 | 295.38 | 291 - | 301 | 295.61 | 2.79E+02 | 85.86 | 8.44E+02 | 1.90 |
| | 12 | 338.75 | 335 - | 343 | 338.97 | 1.02E+02 | 62.34 | 5.34E+02 | 1.60 |
| | 13 | 352.35 | 347 - | 359 | 352.56 | 5.89E+02 | 81.48 | 4.93E+02 | 2.36 |
| | 14 | 463.19 | 459 - | 467 | 463.37 | 4.91E+01 | 43.20 | 2.58E+02 | 2.24 |
| | 15 | 502.08 | 498 - | 505 | 502.24 | 4.27E+01 | 36.55 | 1.91E+02 | 3.10 |
| M | 16 | 507.69 | 506 - | 515 | 507.85 | 2.85E+01 | 21.07 | 8.10E+01 | 2.12 |
| m | 17 | 511.42 | 506 - | 515 | 511.57 | 1.31E+02 | 38.68 | 1.73E+02 | 2.31 |
| | 18 | 583.28 | 578 - | 588 | 583.41 | 2.24E+02 | 51.25 | 2.31E+02 | 2.20 |
| M | 19 | 604.88 | 604 - | 615 | 605.00 | 2.63E+01 | 11.66 | 2.48E+01 | 1.96 |
| m | 20 | 609.49 | 604 - | 615 | 609.61 | 3.63E+02 | 44.68 | 1.02E+02 | 2.11 |
| | 21 | 675.23 | 672 - | 680 | 675.33 | 2.70E+01 | 32.68 | 1.46E+02 | 2.67 |
| | 22 | 727.49 | 722 - | 733 | 727.57 | 4.45E+01 | 44.23 | 2.23E+02 | 2.09 |
| | 23 | 768.97 | 765 - | 773 | 769.03 | 2.95E+01 | 35.30 | 1.69E+02 | 2.42 |
| | 24 | 794.82 | 792 - | 799 | 794.88 | 2.55E+01 | 27.35 | 1.07E+02 | 2.14 |
| | 25 | 834.90 | 833 - | 837 | 834.95 | 1.65E+01 | 19.20 | 6.69E+01 | 2.88 |
| | 26 | 842.21 | 838 - | 847 | 842.25 | 3.00E+01 | 32.09 | 1.30E+02 | 1.81 |
| | 27 | 859.17 | 855 - | 865 | 859.21 | 3.21E+01 | 32.27 | 1.24E+02 | 2.52 |
| | 28 | 872.36 | 869 - | 876 | 872.39 | 2.43E+01 | 24.58 | 8.54E+01 | 1.25 |
| | 29 | 911.11 | 905 - | 914 | 911.13 | 1.27E+02 | 35.40 | 1.10E+02 | 2.34 |
| | 30 | 969.03 | 966 - | 974 | 969.03 | 4.79E+01 | 31.73 | 1.24E+02 | 2.25 |
| | 31 | 1016.81 | 1012 - | 1022 | 1016.80 | 3.07E+01 | 25.64 | 7.07E+01 | 7.16 |
| | 32 | 1088.78 | 1085 - | 1091 | 1088.74 | 2.30E+01 | 19.90 | 5.41E+01 | 2.72 |
| | 33 | 1120.52 | 1116 - | 1124 | 1120.47 | 8.91E+01 | 32.96 | 1.12E+02 | 2.30 |
| | 34 | 1194.26 | 1190 - | 1197 | 1194.19 | 2.75E+01 | 25.06 | 8.30E+01 | 3.28 |
| | 35 | 1240.80 | 1235 - | 1248 | 1240.71 | 7.83E+01 | 34.32 | 8.95E+01 | 9.74 |
| | 36 | 1386.28 | 1383 - | 1390 | 1386.14 | 2.20E+01 | 13.42 | 1.40E+01 | 4.58 |
| | 37 | 1460.82 | 1455 - | 1467 | 1460.66 | 5.68E+02 | 51.46 | 4.10E+01 | 2.83 |
| | 38 | 1508.53 | 1505 - | 1512 | 1508.35 | 1.18E+01 | 12.96 | 2.04E+01 | 3.62 |
| | 39 | 1517.59 | 1515 - | 1520 | 1517.40 | 1.08E+01 | 8.37 | 4.31E+00 | 1.91 |
| | 40 | 1551.72 | 1548 - | 1555 | 1551.53 | 1.06E+01 | 10.39 | 8.80E+00 | 2.57 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|
| 41 | 1564.00 | 1561 - | 1567 | 1563.80 | 8.12E+00 | 9.42 | 9.77E+00 | 3.15 |
| 42 | 1729.21 | 1726 - | 1732 | 1728.95 | 1.20E+01 | 10.23 | 1.00E+01 | 1.83 |
| 43 | 1764.52 | 1760 - | 1767 | 1764.25 | 5.59E+01 | 17.20 | 1.22E+01 | 2.30 |
| 44 | 1976.43 | 1973 - | 1979 | 1976.09 | 6.56E+00 | 6.65 | 2.88E+00 | 1.26 |
| 45 | 2176.58 | 2172 - | 2179 | 2176.17 | 8.00E+00 | 7.48 | 4.00E+00 | 3.69 |
| 46 | 2205.16 | 2200 - | 2208 | 2204.75 | 1.47E+01 | 9.39 | 4.53E+00 | 1.23 |
| 47 | 2302.68 | 2298 - | 2305 | 2302.23 | 1.00E+01 | 9.38 | 8.00E+00 | 2.73 |
| 48 | 2558.20 | 2553 - | 2560 | 2557.67 | 6.00E+00 | 4.90 | 0.00E+00 | 1.92 |
| 49 | 2614.61 | 2609 - | 2618 | 2614.05 | 6.70E+01 | 18.38 | 1.00E+01 | 3.42 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 10:02:15AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 32.21 | 31 - | 35 | 5.09E+01 | 61.71 | 7.96E+02 | 4.94E+01 |
| | 2 | 76.49 | 72 - | 80 | 1.04E+03 | 144.83 | 2.58E+03 | 1.07E+02 |
| | 3 | 86.45 | 83 - | 90 | 1.08E+02 | 118.03 | 2.26E+03 | 9.55E+01 |
| | 4 | 92.96 | 90 - | 96 | 2.96E+02 | 102.18 | 1.65E+03 | 7.91E+01 |
| | 5 | 98.94 | 97 - | 102 | 6.89E+01 | 76.56 | 1.11E+03 | 6.14E+01 |
| | 6 | 130.10 | 127 - | 133 | 1.11E+02 | 79.17 | 1.06E+03 | 6.27E+01 |
| | 7 | 186.16 | 183 - | 189 | 2.26E+02 | 74.19 | 8.36E+02 | 5.58E+01 |
| M | 8 | 238.96 | 234 - | 246 | 6.50E+02 | 73.77 | 5.51E+02 | 3.86E+01 |
| m | 9 | 242.15 | 234 - | 246 | 2.25E+02 | 79.98 | 6.21E+02 | 4.10E+01 |
| | 10 | 271.08 | 268 - | 275 | 7.45E+01 | 59.73 | 5.47E+02 | 4.70E+01 |
| | 11 | 295.38 | 291 - | 301 | 2.79E+02 | 85.86 | 8.44E+02 | 6.50E+01 |
| | 12 | 338.75 | 335 - | 343 | 1.02E+02 | 62.34 | 5.34E+02 | 4.85E+01 |
| | 13 | 352.35 | 347 - | 359 | 5.89E+02 | 81.48 | 4.93E+02 | 5.38E+01 |
| | 14 | 463.19 | 459 - | 467 | 4.91E+01 | 43.20 | 2.58E+02 | 3.36E+01 |
| | 15 | 502.08 | 498 - | 505 | 4.27E+01 | 36.55 | 1.91E+02 | 2.81E+01 |
| M | 16 | 507.69 | 506 - | 515 | 2.85E+01 | 21.07 | 8.10E+01 | 1.48E+01 |
| m | 17 | 511.42 | 506 - | 515 | 1.31E+02 | 38.68 | 1.73E+02 | 2.16E+01 |
| | 18 | 583.28 | 578 - | 588 | 2.24E+02 | 51.25 | 2.31E+02 | 3.42E+01 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| M | 19 | 604.88 | 604 - | 615 | 2.63E+01 | 11.66 | 2.48E+01 | 8.18E+00 |
| m | 20 | 609.49 | 604 - | 615 | 3.63E+02 | 44.68 | 1.02E+02 | 1.66E+01 |
| | 21 | 675.23 | 672 - | 680 | 2.70E+01 | 32.68 | 1.46E+02 | 2.55E+01 |
| | 22 | 727.49 | 722 - | 733 | 4.45E+01 | 44.23 | 2.23E+02 | 3.47E+01 |
| | 23 | 768.97 | 765 - | 773 | 2.95E+01 | 35.30 | 1.69E+02 | 2.76E+01 |
| | 24 | 794.82 | 792 - | 799 | 2.55E+01 | 27.35 | 1.07E+02 | 2.09E+01 |
| | 25 | 834.90 | 833 - | 837 | 1.65E+01 | 19.20 | 6.69E+01 | 1.43E+01 |
| | 26 | 842.21 | 838 - | 847 | 3.00E+01 | 32.09 | 1.30E+02 | 2.48E+01 |
| | 27 | 859.17 | 855 - | 865 | 3.21E+01 | 32.27 | 1.24E+02 | 2.48E+01 |
| | 28 | 872.36 | 869 - | 876 | 2.43E+01 | 24.58 | 8.54E+01 | 1.85E+01 |
| | 29 | 911.11 | 905 - | 914 | 1.27E+02 | 35.40 | 1.10E+02 | 2.24E+01 |
| | 30 | 969.03 | 966 - | 974 | 4.79E+01 | 31.73 | 1.24E+02 | 2.35E+01 |
| | 31 | 1016.81 | 1012 - | 1022 | 3.07E+01 | 25.64 | 7.07E+01 | 1.90E+01 |
| | 32 | 1088.78 | 1085 - | 1091 | 2.30E+01 | 19.90 | 5.41E+01 | 1.43E+01 |
| | 33 | 1120.52 | 1116 - | 1124 | 8.91E+01 | 32.96 | 1.12E+02 | 2.22E+01 |
| | 34 | 1194.26 | 1190 - | 1197 | 2.75E+01 | 25.06 | 8.30E+01 | 1.87E+01 |
| | 35 | 1240.80 | 1235 - | 1248 | 7.83E+01 | 34.32 | 8.95E+01 | 2.42E+01 |
| | 36 | 1386.28 | 1383 - | 1390 | 2.20E+01 | 13.42 | 1.40E+01 | 7.88E+00 |
| | 37 | 1460.82 | 1455 - | 1467 | 5.68E+02 | 51.46 | 4.10E+01 | 1.60E+01 |
| | 38 | 1508.53 | 1505 - | 1512 | 1.18E+01 | 12.96 | 2.04E+01 | 9.03E+00 |
| | 39 | 1517.59 | 1515 - | 1520 | 1.08E+01 | 8.37 | 4.31E+00 | 4.24E+00 |
| | 40 | 1551.72 | 1548 - | 1555 | 1.06E+01 | 10.39 | 8.80E+00 | 6.66E+00 |
| | 41 | 1564.00 | 1561 - | 1567 | 8.12E+00 | 9.42 | 9.77E+00 | 6.17E+00 |
| | 42 | 1729.21 | 1726 - | 1732 | 1.20E+01 | 10.23 | 1.00E+01 | 6.19E+00 |
| | 43 | 1764.52 | 1760 - | 1767 | 5.59E+01 | 17.20 | 1.22E+01 | 6.99E+00 |
| | 44 | 1976.43 | 1973 - | 1979 | 6.56E+00 | 6.65 | 2.88E+00 | 3.49E+00 |
| | 45 | 2176.58 | 2172 - | 2179 | 8.00E+00 | 7.48 | 4.00E+00 | 4.03E+00 |
| | 46 | 2205.16 | 2200 - | 2208 | 1.47E+01 | 9.39 | 4.53E+00 | 4.45E+00 |
| | 47 | 2302.68 | 2298 - | 2305 | 1.00E+01 | 9.38 | 8.00E+00 | 5.70E+00 |
| | 48 | 2558.20 | 2553 - | 2560 | 6.00E+00 | 4.90 | 0.00E+00 | 0.00E+00 |
| | 49 | 2614.61 | 2609 - | 2618 | 6.70E+01 | 18.38 | 1.00E+01 | 6.88E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 10:02:15AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 32.21 | 31 - | 35 | 32.53 | 5.09E+01 | 61.71 | 7.96E+02 | ..... |
| | 2 | 76.49 | 72 - | 80 | 76.80 | 1.04E+03 | 144.83 | 2.58E+03 | ..... |
| | 3 | 86.45 | 83 - | 90 | 86.75 | 1.08E+02 | 118.03 | 2.26E+03 | EU-155 |
| | | | | | | | | | NP-237 |
| | 4 | 92.96 | 90 - | 96 | 93.25 | 2.96E+02 | 102.18 | 1.65E+03 | GA-67 |
| | 5 | 98.94 | 97 - | 102 | 99.24 | 6.89E+01 | 76.56 | 1.11E+03 | ..... |
| | 6 | 130.10 | 127 - | 133 | 130.38 | 1.11E+02 | 79.17 | 1.06E+03 | ..... |
| | 7 | 186.16 | 183 - | 189 | 186.43 | 2.26E+02 | 74.19 | 8.36E+02 | RA-226 |
| M | 8 | 238.96 | 234 - | 246 | 239.20 | 6.50E+02 | 73.77 | 5.51E+02 | PB-212 |
| m | 9 | 242.15 | 234 - | 246 | 242.39 | 2.25E+02 | 79.98 | 6.21E+02 | ..... |
| | 10 | 271.08 | 268 - | 275 | 271.32 | 7.45E+01 | 59.73 | 5.47E+02 | ..... |
| | 11 | 295.38 | 291 - | 301 | 295.61 | 2.79E+02 | 85.86 | 8.44E+02 | PB-214 |
| | 12 | 338.75 | 335 - | 343 | 338.97 | 1.02E+02 | 62.34 | 5.34E+02 | AC-228 |
| | 13 | 352.35 | 347 - | 359 | 352.56 | 5.89E+02 | 81.48 | 4.93E+02 | PB-214 |
| | 14 | 463.19 | 459 - | 467 | 463.37 | 4.91E+01 | 43.20 | 2.58E+02 | SB-125 |
| | 15 | 502.08 | 498 - | 505 | 502.24 | 4.27E+01 | 36.55 | 1.91E+02 | ..... |
| M | 16 | 507.69 | 506 - | 515 | 507.85 | 2.85E+01 | 21.07 | 8.10E+01 | ..... |
| m | 17 | 511.42 | 506 - | 515 | 511.57 | 1.31E+02 | 38.68 | 1.73E+02 | ..... |
| | 18 | 583.28 | 578 - | 588 | 583.41 | 2.24E+02 | 51.25 | 2.31E+02 | TL-208 |
| M | 19 | 604.88 | 604 - | 615 | 605.00 | 2.63E+01 | 11.66 | 2.48E+01 | CS-134 |
| m | 20 | 609.49 | 604 - | 615 | 609.61 | 3.63E+02 | 44.68 | 1.02E+02 | BI-214 |
| | 21 | 675.23 | 672 - | 680 | 675.33 | 2.70E+01 | 32.68 | 1.46E+02 | ..... |
| | 22 | 727.49 | 722 - | 733 | 727.57 | 4.45E+01 | 44.23 | 2.23E+02 | BI-212 |
| | 23 | 768.97 | 765 - | 773 | 769.03 | 2.95E+01 | 35.30 | 1.69E+02 | ..... |
| | 24 | 794.82 | 792 - | 799 | 794.88 | 2.55E+01 | 27.35 | 1.07E+02 | ..... |
| | 25 | 834.90 | 833 - | 837 | 834.95 | 1.65E+01 | 19.20 | 6.69E+01 | MN-54 |
| | 26 | 842.21 | 838 - | 847 | 842.25 | 3.00E+01 | 32.09 | 1.30E+02 | ..... |
| | 27 | 859.17 | 855 - | 865 | 859.21 | 3.21E+01 | 32.27 | 1.24E+02 | ..... |
| | 28 | 872.36 | 869 - | 876 | 872.39 | 2.43E+01 | 24.58 | 8.54E+01 | EU-154 |
| | 29 | 911.11 | 905 - | 914 | 911.13 | 1.27E+02 | 35.40 | 1.10E+02 | AC-228 |
| | | | | | | | | | TL-204 |
| | 30 | 969.03 | 966 - | 974 | 969.03 | 4.79E+01 | 31.73 | 1.24E+02 | AC-228 |
| | 31 | 1016.81 | 1012 - | 1022 | 1016.80 | 3.07E+01 | 25.64 | 7.07E+01 | ..... |
| | 32 | 1088.78 | 1085 - | 1091 | 1088.74 | 2.30E+01 | 19.90 | 5.41E+01 | ..... |
| | 33 | 1120.52 | 1116 - | 1124 | 1120.47 | 8.91E+01 | 32.96 | 1.12E+02 | SC-46 |
| | | | | | | | | | BI-214 |
| | | | | | | | | | TA-182 |
| | 34 | 1194.26 | 1190 - | 1197 | 1194.19 | 2.75E+01 | 25.06 | 8.30E+01 | ..... |
| | 35 | 1240.80 | 1235 - | 1248 | 1240.71 | 7.83E+01 | 34.32 | 8.95E+01 | ..... |
| | 36 | 1386.28 | 1383 - | 1390 | 1386.14 | 2.20E+01 | 13.42 | 1.40E+01 | ..... |
| | 37 | 1460.82 | 1455 - | 1467 | 1460.66 | 5.68E+02 | 51.46 | 4.10E+01 | K-40 |
| | 38 | 1508.53 | 1505 - | 1512 | 1508.35 | 1.18E+01 | 12.96 | 2.04E+01 | ..... |
| | 39 | 1517.59 | 1515 - | 1520 | 1517.40 | 1.08E+01 | 8.37 | 4.31E+00 | ..... |
| | 40 | 1551.72 | 1548 - | 1555 | 1551.53 | 1.06E+01 | 10.39 | 8.80E+00 | ..... |
| | 41 | 1564.00 | 1561 - | 1567 | 1563.80 | 8.12E+00 | 9.42 | 9.77E+00 | ..... |
| | 42 | 1729.21 | 1726 - | 1732 | 1728.95 | 1.20E+01 | 10.23 | 1.00E+01 | ..... |
| | 43 | 1764.52 | 1760 - | 1767 | 1764.25 | 5.59E+01 | 17.20 | 1.22E+01 | BI-214 |
| | 44 | 1976.43 | 1973 - | 1979 | 1976.09 | 6.56E+00 | 6.65 | 2.88E+00 | ..... |
| | 45 | 2176.58 | 2172 - | 2179 | 2176.17 | 8.00E+00 | 7.48 | 4.00E+00 | ..... |
| | 46 | 2205.16 | 2200 - | 2208 | 2204.75 | 1.47E+01 | 9.39 | 4.53E+00 | BI-214 |
| | 47 | 2302.68 | 2298 - | 2305 | 2302.23 | 1.00E+01 | 9.38 | 8.00E+00 | ..... |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|
| 48 | 2558.20 | 2553 - | 2560 | 2557.67 | 6.00E+00 | 4.90 | 0.00E+00 | ..... |
| 49 | 2614.61 | 2609 - | 2618 | 2614.05 | 6.70E+01 | 18.38 | 1.00E+01 | TL-208 |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 10:02:15AM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 32.21 | 5.09E+01 | 61.71 | 7.19E-03 | 1.73E-03 |
| | 2 | 76.49 | 1.04E+03 | 144.83 | 2.67E-02 | 2.04E-03 |
| | 3 | 86.45 | 1.08E+02 | 118.03 | 2.71E-02 | 2.23E-03 |
| | 4 | 92.96 | 2.96E+02 | 102.18 | 2.71E-02 | 2.24E-03 |
| | 5 | 98.94 | 6.89E+01 | 76.56 | 2.69E-02 | 2.21E-03 |
| | 6 | 130.10 | 1.11E+02 | 79.17 | 2.45E-02 | 2.03E-03 |
| | 7 | 186.16 | 2.26E+02 | 74.19 | 1.96E-02 | 1.55E-03 |
| M | 8 | 238.96 | 6.50E+02 | 73.77 | 1.61E-02 | 1.34E-03 |
| m | 9 | 242.15 | 2.25E+02 | 79.98 | 1.59E-02 | 1.33E-03 |
| | 10 | 271.08 | 7.45E+01 | 59.73 | 1.45E-02 | 1.21E-03 |
| | 11 | 295.38 | 2.79E+02 | 85.86 | 1.35E-02 | 1.15E-03 |
| | 12 | 338.75 | 1.02E+02 | 62.34 | 1.19E-02 | 1.06E-03 |
| | 13 | 352.35 | 5.89E+02 | 81.48 | 1.15E-02 | 1.03E-03 |
| | 14 | 463.19 | 4.91E+01 | 43.20 | 9.02E-03 | 8.58E-04 |
| | 15 | 502.08 | 4.27E+01 | 36.55 | 8.39E-03 | 8.06E-04 |
| M | 16 | 507.69 | 2.85E+01 | 21.07 | 8.30E-03 | 7.99E-04 |
| m | 17 | 511.42 | 1.31E+02 | 38.68 | 8.25E-03 | 7.94E-04 |
| | 18 | 583.28 | 2.24E+02 | 51.25 | 7.32E-03 | 6.98E-04 |
| M | 19 | 604.88 | 2.63E+01 | 11.66 | 7.09E-03 | 6.70E-04 |
| m | 20 | 609.49 | 3.63E+02 | 44.68 | 7.04E-03 | 6.64E-04 |
| | 21 | 675.23 | 2.70E+01 | 32.68 | 6.42E-03 | 5.83E-04 |
| | 22 | 727.49 | 4.45E+01 | 44.23 | 6.01E-03 | 5.36E-04 |
| | 23 | 768.97 | 2.95E+01 | 35.30 | 5.72E-03 | 5.00E-04 |
| | 24 | 794.82 | 2.55E+01 | 27.35 | 5.55E-03 | 4.77E-04 |
| | 25 | 834.90 | 1.65E+01 | 19.20 | 5.31E-03 | 4.42E-04 |
| | 26 | 842.21 | 3.00E+01 | 32.09 | 5.27E-03 | 4.35E-04 |
| | 27 | 859.17 | 3.21E+01 | 32.27 | 5.18E-03 | 4.20E-04 |
| | 28 | 872.36 | 2.43E+01 | 24.58 | 5.11E-03 | 4.09E-04 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 29 | 911.11 | 1.27E+02 | 35.40 | 4.92E-03 | 3.84E-04 |
| 30 | 969.03 | 4.79E+01 | 31.73 | 4.66E-03 | 3.74E-04 |
| 31 | 1016.81 | 3.07E+01 | 25.64 | 4.47E-03 | 3.67E-04 |
| 32 | 1088.78 | 2.30E+01 | 19.90 | 4.22E-03 | 3.55E-04 |
| 33 | 1120.52 | 8.91E+01 | 32.96 | 4.12E-03 | 3.50E-04 |
| 34 | 1194.26 | 2.75E+01 | 25.06 | 3.90E-03 | 3.35E-04 |
| 35 | 1240.80 | 7.83E+01 | 34.32 | 3.78E-03 | 3.22E-04 |
| 36 | 1386.28 | 2.20E+01 | 13.42 | 3.45E-03 | 2.87E-04 |
| 37 | 1460.82 | 5.68E+02 | 51.46 | 3.31E-03 | 2.75E-04 |
| 38 | 1508.53 | 1.18E+01 | 12.96 | 3.23E-03 | 2.67E-04 |
| 39 | 1517.59 | 1.08E+01 | 8.37 | 3.21E-03 | 2.66E-04 |
| 40 | 1551.72 | 1.06E+01 | 10.39 | 3.16E-03 | 2.61E-04 |
| 41 | 1564.00 | 8.12E+00 | 9.42 | 3.14E-03 | 2.59E-04 |
| 42 | 1729.21 | 1.20E+01 | 10.23 | 2.91E-03 | 2.32E-04 |
| 43 | 1764.52 | 5.59E+01 | 17.20 | 2.87E-03 | 2.26E-04 |
| 44 | 1976.43 | 6.56E+00 | 6.65 | 2.65E-03 | 2.15E-04 |
| 45 | 2176.58 | 8.00E+00 | 7.48 | 2.48E-03 | 2.15E-04 |
| 46 | 2205.16 | 1.47E+01 | 9.39 | 2.46E-03 | 2.15E-04 |
| 47 | 2302.68 | 1.00E+01 | 9.38 | 2.40E-03 | 2.15E-04 |
| 48 | 2558.20 | 6.00E+00 | 4.90 | 2.26E-03 | 2.15E-04 |
| 49 | 2614.61 | 6.70E+01 | 18.38 | 2.24E-03 | 2.15E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 10:02:15AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055575.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 32.21 | 5.09E+01 | 61.71 | | | 5.09E+01 | 6.17E+01 |
| | 2 | 76.49 | 1.04E+03 | 144.83 | | | 1.04E+03 | 1.45E+02 |
| | 3 | 86.45 | 1.08E+02 | 118.03 | | | 1.08E+02 | 1.18E+02 |
| | 4 | 92.96 | 2.96E+02 | 102.18 | 7.98E+01 | 7.31E+00 | 2.16E+02 | 1.02E+02 |
| | 5 | 98.94 | 6.89E+01 | 76.56 | | | 6.89E+01 | 7.66E+01 |
| | 6 | 130.10 | 1.11E+02 | 79.17 | | | 1.11E+02 | 7.92E+01 |
| | 7 | 186.16 | 2.26E+02 | 74.19 | 3.06E+01 | 5.82E+00 | 1.95E+02 | 7.44E+01 |
| M | 8 | 238.96 | 6.50E+02 | 73.77 | 1.40E+01 | 2.71E+00 | 6.36E+02 | 7.38E+01 |
| m | 9 | 242.15 | 2.25E+02 | 79.98 | | | 2.25E+02 | 8.00E+01 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 10 | 271.08 | 7.45E+01 | 59.73 | | | 7.45E+01 | 5.97E+01 |
| | 11 | 295.38 | 2.79E+02 | 85.86 | | | 2.79E+02 | 8.59E+01 |
| | 12 | 338.75 | 1.02E+02 | 62.34 | | | 1.02E+02 | 6.23E+01 |
| | 13 | 352.35 | 5.89E+02 | 81.48 | 6.53E+00 | 4.43E+00 | 5.83E+02 | 8.16E+01 |
| | 14 | 463.19 | 4.91E+01 | 43.20 | | | 4.91E+01 | 4.32E+01 |
| | 15 | 502.08 | 4.27E+01 | 36.55 | | | 4.27E+01 | 3.66E+01 |
| M | 16 | 507.69 | 2.85E+01 | 21.07 | | | 2.85E+01 | 2.11E+01 |
| m | 17 | 511.42 | 1.31E+02 | 38.68 | 5.21E+01 | 4.74E+00 | 7.93E+01 | 3.90E+01 |
| | 18 | 583.28 | 2.24E+02 | 51.25 | | | 2.24E+02 | 5.12E+01 |
| M | 19 | 604.88 | 2.63E+01 | 11.66 | | | 2.63E+01 | 1.17E+01 |
| m | 20 | 609.49 | 3.63E+02 | 44.68 | 3.25E+00 | 2.97E+00 | 3.60E+02 | 4.48E+01 |
| | 21 | 675.23 | 2.70E+01 | 32.68 | | | 2.70E+01 | 3.27E+01 |
| | 22 | 727.49 | 4.45E+01 | 44.23 | | | 4.45E+01 | 4.42E+01 |
| | 23 | 768.97 | 2.95E+01 | 35.30 | | | 2.95E+01 | 3.53E+01 |
| | 24 | 794.82 | 2.55E+01 | 27.35 | 0.00E+00 | 0.00E+00 | 2.55E+01 | 2.73E+01 |
| | 25 | 834.90 | 1.65E+01 | 19.20 | | | 1.65E+01 | 1.92E+01 |
| | 26 | 842.21 | 3.00E+01 | 32.09 | | | 3.00E+01 | 3.21E+01 |
| | 27 | 859.17 | 3.21E+01 | 32.27 | | | 3.21E+01 | 3.23E+01 |
| | 28 | 872.36 | 2.43E+01 | 24.58 | | | 2.43E+01 | 2.46E+01 |
| | 29 | 911.11 | 1.27E+02 | 35.40 | 2.85E+00 | 2.76E+00 | 1.24E+02 | 3.55E+01 |
| | 30 | 969.03 | 4.79E+01 | 31.73 | | | 4.79E+01 | 3.17E+01 |
| | 31 | 1016.81 | 3.07E+01 | 25.64 | | | 3.07E+01 | 2.56E+01 |
| | 32 | 1088.78 | 2.30E+01 | 19.90 | | | 2.30E+01 | 1.99E+01 |
| | 33 | 1120.52 | 8.91E+01 | 32.96 | | | 8.91E+01 | 3.30E+01 |
| | 34 | 1194.26 | 2.75E+01 | 25.06 | | | 2.75E+01 | 2.51E+01 |
| | 35 | 1240.80 | 7.83E+01 | 34.32 | | | 7.83E+01 | 3.43E+01 |
| | 36 | 1386.28 | 2.20E+01 | 13.42 | | | 2.20E+01 | 1.34E+01 |
| | 37 | 1460.82 | 5.68E+02 | 51.46 | 1.00E+00 | 1.77E+00 | 5.67E+02 | 5.15E+01 |
| | 38 | 1508.53 | 1.18E+01 | 12.96 | | | 1.18E+01 | 1.30E+01 |
| | 39 | 1517.59 | 1.08E+01 | 8.37 | | | 1.08E+01 | 8.37E+00 |
| | 40 | 1551.72 | 1.06E+01 | 10.39 | | | 1.06E+01 | 1.04E+01 |
| | 41 | 1564.00 | 8.12E+00 | 9.42 | | | 8.12E+00 | 9.42E+00 |
| | 42 | 1729.21 | 1.20E+01 | 10.23 | | | 1.20E+01 | 1.02E+01 |
| | 43 | 1764.52 | 5.59E+01 | 17.20 | | | 5.59E+01 | 1.72E+01 |
| | 44 | 1976.43 | 6.56E+00 | 6.65 | | | 6.56E+00 | 6.65E+00 |
| | 45 | 2176.58 | 8.00E+00 | 7.48 | | | 8.00E+00 | 7.48E+00 |
| | 46 | 2205.16 | 1.47E+01 | 9.39 | | | 1.47E+01 | 9.39E+00 |
| | 47 | 2302.68 | 1.00E+01 | 9.38 | | | 1.00E+01 | 9.38E+00 |
| | 48 | 2558.20 | 6.00E+00 | 4.90 | | | 6.00E+00 | 4.90E+00 |
| | 49 | 2614.61 | 6.70E+01 | 18.38 | 1.86E+00 | 1.12E+00 | 6.51E+01 | 1.84E+01 |

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

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 10:02:15AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055575.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 32.21 | 5.09E+01 | 61.71 | | | 5.09E+01 | 6.17E+01 |
| | 2 | 76.49 | 1.04E+03 | 144.83 | | | 1.04E+03 | 1.45E+02 |
| | 3 | 86.45 | 1.08E+02 | 118.03 | | | 1.08E+02 | 1.18E+02 |
| | 4 | 92.96 | 2.96E+02 | 102.18 | 7.98E+01 | 7.31E+00 | 2.16E+02 | 1.02E+02 |
| | 5 | 98.94 | 6.89E+01 | 76.56 | | | 6.89E+01 | 7.66E+01 |
| | 6 | 130.10 | 1.11E+02 | 79.17 | | | 1.11E+02 | 7.92E+01 |
| | 7 | 186.16 | 2.26E+02 | 74.19 | 3.06E+01 | 5.82E+00 | 1.95E+02 | 7.44E+01 |
| M | 8 | 238.96 | 6.50E+02 | 73.77 | 1.40E+01 | 2.71E+00 | 6.36E+02 | 7.38E+01 |
| m | 9 | 242.15 | 2.25E+02 | 79.98 | | | 2.25E+02 | 8.00E+01 |
| | 10 | 271.08 | 7.45E+01 | 59.73 | | | 7.45E+01 | 5.97E+01 |
| | 11 | 295.38 | 2.79E+02 | 85.86 | | | 2.79E+02 | 8.59E+01 |
| | 12 | 338.75 | 1.02E+02 | 62.34 | | | 1.02E+02 | 6.23E+01 |
| | 13 | 352.35 | 5.89E+02 | 81.48 | 6.53E+00 | 4.43E+00 | 5.83E+02 | 8.16E+01 |
| | 14 | 463.19 | 4.91E+01 | 43.20 | | | 4.91E+01 | 4.32E+01 |
| | 15 | 502.08 | 4.27E+01 | 36.55 | | | 4.27E+01 | 3.66E+01 |
| M | 16 | 507.69 | 2.85E+01 | 21.07 | | | 2.85E+01 | 2.11E+01 |
| m | 17 | 511.42 | 1.31E+02 | 38.68 | 5.21E+01 | 4.74E+00 | 7.93E+01 | 3.90E+01 |
| | 18 | 583.28 | 2.24E+02 | 51.25 | | | 2.24E+02 | 5.12E+01 |
| M | 19 | 604.88 | 2.63E+01 | 11.66 | | | 2.63E+01 | 1.17E+01 |
| m | 20 | 609.49 | 3.63E+02 | 44.68 | 3.25E+00 | 2.97E+00 | 3.60E+02 | 4.48E+01 |
| | 21 | 675.23 | 2.70E+01 | 32.68 | | | 2.70E+01 | 3.27E+01 |
| | 22 | 727.49 | 4.45E+01 | 44.23 | | | 4.45E+01 | 4.42E+01 |
| | 23 | 768.97 | 2.95E+01 | 35.30 | | | 2.95E+01 | 3.53E+01 |
| | 24 | 794.82 | 2.55E+01 | 27.35 | 0.00E+00 | 0.00E+00 | 2.55E+01 | 2.73E+01 |
| | 25 | 834.90 | 1.65E+01 | 19.20 | | | 1.65E+01 | 1.92E+01 |
| | 26 | 842.21 | 3.00E+01 | 32.09 | | | 3.00E+01 | 3.21E+01 |
| | 27 | 859.17 | 3.21E+01 | 32.27 | | | 3.21E+01 | 3.23E+01 |
| | 28 | 872.36 | 2.43E+01 | 24.58 | | | 2.43E+01 | 2.46E+01 |
| | 29 | 911.11 | 1.27E+02 | 35.40 | 2.85E+00 | 2.76E+00 | 1.24E+02 | 3.55E+01 |
| | 30 | 969.03 | 4.79E+01 | 31.73 | | | 4.79E+01 | 3.17E+01 |
| | 31 | 1016.81 | 3.07E+01 | 25.64 | | | 3.07E+01 | 2.56E+01 |
| | 32 | 1088.78 | 2.30E+01 | 19.90 | | | 2.30E+01 | 1.99E+01 |
| | 33 | 1120.52 | 8.91E+01 | 32.96 | | | 8.91E+01 | 3.30E+01 |
| | 34 | 1194.26 | 2.75E+01 | 25.06 | | | 2.75E+01 | 2.51E+01 |
| | 35 | 1240.80 | 7.83E+01 | 34.32 | | | 7.83E+01 | 3.43E+01 |
| | 36 | 1386.28 | 2.20E+01 | 13.42 | | | 2.20E+01 | 1.34E+01 |
| | 37 | 1460.82 | 5.68E+02 | 51.46 | 1.00E+00 | 1.77E+00 | 5.67E+02 | 5.15E+01 |
| | 38 | 1508.53 | 1.18E+01 | 12.96 | | | 1.18E+01 | 1.30E+01 |
| | 39 | 1517.59 | 1.08E+01 | 8.37 | | | 1.08E+01 | 8.37E+00 |
| | 40 | 1551.72 | 1.06E+01 | 10.39 | | | 1.06E+01 | 1.04E+01 |
| | 41 | 1564.00 | 8.12E+00 | 9.42 | | | 8.12E+00 | 9.42E+00 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 42 | 1729.21 | 1.20E+01 | 10.23 | | | 1.20E+01 | 1.02E+01 |
| 43 | 1764.52 | 5.59E+01 | 17.20 | | | 5.59E+01 | 1.72E+01 |
| 44 | 1976.43 | 6.56E+00 | 6.65 | | | 6.56E+00 | 6.65E+00 |
| 45 | 2176.58 | 8.00E+00 | 7.48 | | | 8.00E+00 | 7.48E+00 |
| 46 | 2205.16 | 1.47E+01 | 9.39 | | | 1.47E+01 | 9.39E+00 |
| 47 | 2302.68 | 1.00E+01 | 9.38 | | | 1.00E+01 | 9.38E+00 |
| 48 | 2558.20 | 6.00E+00 | 4.90 | | | 6.00E+00 | 4.90E+00 |
| 49 | 2614.61 | 6.70E+01 | 18.38 | 1.86E+00 | 1.12E+00 | 6.51E+01 | 1.84E+01 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 1.000 | 1460.81 | * | 10.67 | 1.56E+01 | 1.95E+00 |
| MN-54 | 0.999 | 834.83 | * | 99.97 | 3.76E-02 | 4.38E-02 |
| EU-155 | 0.362 | 86.50 | * | 30.90 | 1.30E-01 | 1.42E-01 |
| | | 105.30 | | 20.70 | | |
| TL-208 | 0.886 | 583.14 | * | 30.22 | 9.80E-01 | 2.43E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 7.88E-01 | 2.35E-01 |
| BI-212 | 0.759 | 727.17 | * | 11.80 | 6.09E-01 | 6.08E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.881 | 238.63 | * | 44.60 | 8.59E-01 | 1.23E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.987 | 609.31 | * | 46.30 | 1.07E+00 | 1.67E-01 |
| | | 1120.29 | * | 15.10 | 1.39E+00 | 5.28E-01 |
| | | 1764.49 | * | 15.80 | 1.20E+00 | 3.81E-01 |
| | | 2204.22 | * | 4.98 | 1.17E+00 | 7.50E-01 |
| PB-214 | 0.979 | 295.21 | * | 19.19 | 1.05E+00 | 3.35E-01 |
| | | 351.92 | * | 37.19 | 1.32E+00 | 2.19E-01 |
| RA-226 | 1.000 | 186.21 | * | 3.28 | 2.95E+00 | 5.52E+00 |
| AC-228 | 0.993 | 338.32 | * | 11.40 | 7.27E-01 | 4.49E-01 |
| | | 911.07 | * | 27.70 | 8.85E-01 | 2.62E-01 |
| | | 969.11 | * | 16.60 | 6.01E-01 | 4.01E-01 |
| NP-237 | 1.000 | 86.50 | * | 12.60 | 3.08E-01 | 3.36E-01 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 10:02:15AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 32.21 | 1.41314E-02 | 60.65 | | |
| | 2 | 76.49 | 2.89013E-01 | 6.96 | | |
| | 4 | 92.96 | 6.00287E-02 | 23.70 | | |
| | 5 | 98.94 | 1.91266E-02 | 55.60 | D-Esc | |
| | 6 | 130.10 | 3.07707E-02 | 35.73 | | |
| m | 9 | 242.15 | 6.26065E-02 | 17.74 | | |
| | 10 | 271.08 | 2.07016E-02 | 40.08 | | |
| | 14 | 463.19 | 1.36361E-02 | 44.00 | Tol. | SB-125 |
| | 15 | 502.08 | 1.18639E-02 | 42.79 | | |
| M | 16 | 507.69 | 7.91529E-03 | 36.97 | | |
| m | 17 | 511.42 | 2.20391E-02 | 24.56 | | |
| M | 19 | 604.88 | 7.31513E-03 | 22.14 | Tol. | CS-134 |
| | 21 | 675.23 | 7.50278E-03 | 60.50 | | |
| | 23 | 768.97 | 8.20297E-03 | 59.76 | Sum | |
| | 24 | 794.82 | 7.07454E-03 | 53.69 | Sum | |
| | 26 | 842.21 | 8.33333E-03 | 53.49 | | |
| | 27 | 859.17 | 8.92731E-03 | 50.21 | | |
| | 28 | 872.36 | 6.75166E-03 | 50.56 | Tol. | EU-154 |
| | 31 | 1016.81 | 8.51852E-03 | 41.80 | | |
| | 32 | 1088.78 | 6.37778E-03 | 43.34 | | |
| | 34 | 1194.26 | 7.63688E-03 | 45.58 | | |
| | 35 | 1240.80 | 2.17412E-02 | 21.93 | | |
| | 36 | 1386.28 | 6.11111E-03 | 30.49 | | |
| | 38 | 1508.53 | 3.28283E-03 | 54.84 | | |
| | 39 | 1517.59 | 3.01282E-03 | 38.57 | | |
| | 40 | 1551.72 | 2.94444E-03 | 49.02 | Sum | |
| | 41 | 1564.00 | 2.25427E-03 | 58.04 | | |
| | 42 | 1729.21 | 3.33333E-03 | 42.64 | Sum | |
| | 44 | 1976.43 | 1.82292E-03 | 50.68 | | |
| | 45 | 2176.58 | 2.22222E-03 | 46.77 | | |
| | 47 | 2302.68 | 2.77778E-03 | 46.90 | | |
| | 48 | 2558.20 | 1.66667E-03 | 40.82 | Sum | |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 1.00 | 1460.81 | * | 10.67 | 1.56E+01 | 1.95E+00 |
| MN-54 | 0.99 | 834.83 | * | 99.97 | 3.76E-02 | 4.38E-02 |
| EU-155 | 0.36 | 86.50 | * | 30.90 | 1.30E-01 | 1.42E-01 |
| | | 105.30 | | 20.70 | | |
| TL-208 | 0.88 | 583.14 | * | 30.22 | 9.80E-01 | 2.43E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 7.88E-01 | 2.35E-01 |
| BI-212 | 0.75 | 727.17 | * | 11.80 | 6.09E-01 | 6.08E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.88 | 238.63 | * | 44.60 | 8.59E-01 | 1.23E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.98 | 609.31 | * | 46.30 | 1.07E+00 | 1.67E-01 |
| | | 1120.29 | * | 15.10 | 1.39E+00 | 5.28E-01 |
| | | 1764.49 | * | 15.80 | 1.20E+00 | 3.81E-01 |
| | | 2204.22 | * | 4.98 | 1.17E+00 | 7.50E-01 |
| PB-214 | 0.97 | 295.21 | * | 19.19 | 1.05E+00 | 3.35E-01 |
| | | 351.92 | * | 37.19 | 1.32E+00 | 2.19E-01 |
| RA-226 | 1.00 | 186.21 | * | 3.28 | 2.95E+00 | 5.52E+00 |
| AC-228 | 0.99 | 338.32 | * | 11.40 | 7.27E-01 | 4.49E-01 |
| | | 911.07 | * | 27.70 | 8.85E-01 | 2.62E-01 |
| | | 969.11 | * | 16.60 | 6.01E-01 | 4.01E-01 |
| NP-237 | 1.00 | 86.50 | * | 12.60 | 3.08E-01 | 3.36E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 1.000 | 1.56E+01 | 1.95E+00 | |
| | MN-54 | 0.999 | 3.76E-02 | 4.38E-02 | |
| ? | EU-155 | 0.362 | 1.30E-01 | 1.42E-01 | |
| | TL-208 | 0.886 | 8.81E-01 | 1.69E-01 | |
| | BI-212 | 0.759 | 6.09E-01 | 6.08E-01 | |
| | PB-212 | 0.881 | 8.59E-01 | 1.23E-01 | |
| | BI-214 | 0.987 | 1.12E+00 | 1.44E-01 | |
| | PB-214 | 0.979 | 1.24E+00 | 1.83E-01 | |
| | RA-226 | 1.000 | 2.95E+00 | 5.52E+00 | |
| | AC-228 | 0.993 | 7.86E-01 | 1.97E-01 | |
| ? | NP-237 | 1.000 | 3.08E-01 | 3.36E-01 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 10:02:15AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 32.21 | 1.41314E-02 | 60.65 | | |
| | 2 | 76.49 | 2.89013E-01 | 6.96 | | |
| | 4 | 92.96 | 6.00287E-02 | 23.70 | | |
| | 5 | 98.94 | 1.91266E-02 | 55.60 | D-Esc | |
| | 6 | 130.10 | 3.07707E-02 | 35.73 | | |
| m | 9 | 242.15 | 6.26065E-02 | 17.74 | | |
| | 10 | 271.08 | 2.07016E-02 | 40.08 | | |
| | 14 | 463.19 | 1.36361E-02 | 44.00 | Tol. | SB-125 |
| | 15 | 502.08 | 1.18639E-02 | 42.79 | | |
| M | 16 | 507.69 | 7.91529E-03 | 36.97 | | |
| m | 17 | 511.42 | 2.20391E-02 | 24.56 | | |
| M | 19 | 604.88 | 7.31513E-03 | 22.14 | Tol. | CS-134 |
| | 21 | 675.23 | 7.50278E-03 | 60.50 | | |
| | 23 | 768.97 | 8.20297E-03 | 59.76 | Sum | |
| | 24 | 794.82 | 7.07454E-03 | 53.69 | Sum | |
| | 26 | 842.21 | 8.33333E-03 | 53.49 | | |
| | 27 | 859.17 | 8.92731E-03 | 50.21 | | |
| | 28 | 872.36 | 6.75166E-03 | 50.56 | Tol. | EU-154 |
| | 31 | 1016.81 | 8.51852E-03 | 41.80 | | |
| | 32 | 1088.78 | 6.37778E-03 | 43.34 | | |
| | 34 | 1194.26 | 7.63688E-03 | 45.58 | | |
| | 35 | 1240.80 | 2.17412E-02 | 21.93 | | |
| | 36 | 1386.28 | 6.11111E-03 | 30.49 | | |
| | 38 | 1508.53 | 3.28283E-03 | 54.84 | | |
| | 39 | 1517.59 | 3.01282E-03 | 38.57 | | |
| | 40 | 1551.72 | 2.94444E-03 | 49.02 | Sum | |
| | 41 | 1564.00 | 2.25427E-03 | 58.04 | | |
| | 42 | 1729.21 | 3.33333E-03 | 42.64 | Sum | |
| | 44 | 1976.43 | 1.82292E-03 | 50.68 | | |
| | 45 | 2176.58 | 2.22222E-03 | 46.77 | | |
| | 47 | 2302.68 | 2.77778E-03 | 46.90 | | |
| | 48 | 2558.20 | 1.66667E-03 | 40.82 | Sum | |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | -1.16E+00 | 1.97E+00 | 1.97E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | 9.83E-03 | 9.68E-02 | 9.68E-02 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | 4.32E-03 | 6.51E-02 | 6.51E-02 |
| + | | K-40 | 1460.81 | * | 10.67 | 1.56E+01 | 9.62E-01 | 9.62E-01 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | -2.47E-02 | 5.17E-02 | 5.17E-02 |
| | | | 78.34 | | 96.00 | 1.74E-01 | | 6.51E-02 |
| + | | SC-46 | 889.25 | | 99.98 | -4.97E-02 | 1.58E-01 | 1.58E-01 |
| | | | 1120.51 | | 99.99 | 5.01E-01 | | 3.06E-01 |
| + | | V-48 | 983.52 | | 99.98 | 3.57E+00 | 5.58E+00 | 5.71E+00 |
| | | | 1312.10 | | 97.50 | -1.43E+00 | | 5.58E+00 |
| + | | CR-51 | 320.08 | | 9.83 | -2.15E+00 | 6.32E+00 | 6.32E+00 |
| + | | MN-54 | 834.83 | * | 99.97 | 3.76E-02 | 7.13E-02 | 7.13E-02 |
| + | | CO-56 | 846.75 | | 99.96 | 2.21E-03 | 1.61E-01 | 1.61E-01 |
| | | | 1037.75 | | 14.03 | 1.68E-01 | | 1.22E+00 |
| | | | 1238.25 | | 67.00 | 1.82E-01 | | 3.99E-01 |
| | | | 1771.40 | | 15.51 | -3.93E-02 | | 9.87E-01 |
| | | | 2598.48 | | 16.90 | -1.43E-01 | | 5.69E-01 |
| + | | CO-57 | 122.06 | | 85.51 | 2.17E-02 | 5.77E-02 | 5.77E-02 |
| | | | 136.48 | | 10.60 | 1.25E-01 | | 4.76E-01 |
| + | | CO-58 | 810.76 | | 99.40 | 8.79E-03 | 1.68E-01 | 1.68E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | -1.28E-01 | 6.50E-01 | 6.50E-01 |
| | | | 1291.56 | | 43.20 | -7.46E-02 | | 8.67E-01 |
| + | | CO-60 | 1173.22 | | 100.00 | -3.41E-02 | 8.62E-02 | 8.62E-02 |
| | | | 1332.49 | | 100.00 | -2.71E-03 | | 8.86E-02 |
| + | | ZN-65 | 1115.52 | | 50.75 | 3.76E-03 | 2.20E-01 | 2.20E-01 |
| + | | GA-67 | 93.31 | | 35.70 | 2.82E+08 | 1.94E+08 | 1.94E+08 |
| | | | 208.95 | | 2.24 | 2.47E+09 | | 3.54E+09 |
| | | | 300.22 | | 16.00 | 1.64E+08 | | 5.46E+08 |
| + | | SE-75 | 121.11 | | 16.70 | -8.19E-02 | 1.15E-01 | 3.93E-01 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | SE-75 | 136.00 | 59.20 | -4.44E-02 | 1.15E-01 | 1.15E-01 |
| | | 264.65 | 59.80 | 3.02E-02 | | 1.49E-01 |
| | | 279.53 | 25.20 | 1.63E-01 | | 3.87E-01 |
| | | 400.65 | 11.40 | 2.11E-01 | | 9.00E-01 |
| + | RB-82 | 776.52 | 13.00 | -4.31E+00 | 6.98E+00 | 6.98E+00 |
| + | RB-83 | 520.41 | 46.00 | 2.83E-02 | 2.88E-01 | 2.88E-01 |
| | | 529.64 | 30.30 | -1.34E-01 | | 3.90E-01 |
| | | 552.65 | 16.40 | -3.75E-01 | | 7.79E-01 |
| + | KR-85 | 513.99 | 0.43 | 3.76E-01 | 1.91E+01 | 1.91E+01 |
| + | SR-85 | 513.99 | 99.27 | 4.66E-03 | 2.37E-01 | 2.37E-01 |
| + | Y-88 | 898.02 | 93.40 | 8.66E-02 | 1.11E-01 | 1.62E-01 |
| | | 1836.01 | 99.38 | 1.78E-02 | | 1.11E-01 |
| + | MO-93 | 263.06 | 56.72 | -4.40E-03 | 6.48E-02 | 9.02E-02 |
| | | 684.67 | 99.68 | 1.38E-02 | | 6.76E-02 |
| | | 1477.11 | 99.08 | 6.46E-03 | | 6.48E-02 |
| + | NB-93M | 16.57 | 9.43 | 2.68E+00 | 5.64E+01 | 5.64E+01 |
| + | NB-94 | 702.63 | 100.00 | 1.81E-02 | 6.94E-02 | 6.94E-02 |
| | | 871.10 | 100.00 | 6.64E-03 | | 7.12E-02 |
| + | NB-95 | 765.79 | 99.81 | 1.44E-01 | 5.93E-01 | 5.93E-01 |
| + | NB-95M | 235.69 | 25.00 | 3.00E+07 | 5.73E+07 | 5.73E+07 |
| + | ZR-95 | 724.18 | 43.70 | -2.13E-03 | 3.56E-01 | 4.94E-01 |
| | | 756.72 | 55.30 | 5.79E-03 | | 3.56E-01 |
| + | MO-99 | 181.06 | 6.20 | -1.83E+09 | 3.76E+10 | 4.90E+10 |
| | | 739.58 | 12.80 | 1.39E+10 | | 3.76E+10 |
| | | 778.00 | 4.50 | 1.14E+09 | | 1.02E+11 |
| + | RU-103 | 497.08 | 89.00 | -2.37E-02 | 3.73E-01 | 3.73E-01 |
| + | RU-106 | 621.84 | 9.80 | -7.95E-02 | 7.14E-01 | 7.14E-01 |
| + | AG-108M | 433.93 | 89.90 | 3.39E-02 | 6.92E-02 | 6.92E-02 |
| | | 614.37 | 90.40 | -3.08E-03 | | 8.74E-02 |
| | | 722.95 | 90.50 | -2.37E-03 | | 7.15E-02 |
| + | CD-109 | 88.03 | 3.72 | 5.24E-01 | 1.50E+00 | 1.50E+00 |
| + | AG-110M | 657.75 | 93.14 | -1.02E-01 | 8.75E-02 | 8.75E-02 |
| | | 677.61 | 10.53 | -8.49E-02 | | 8.31E-01 |
| | | 706.67 | 16.46 | 4.20E-01 | | 5.87E-01 |
| | | 763.93 | 21.98 | 5.82E-02 | | 4.24E-01 |
| | | 884.67 | 71.63 | 1.77E-03 | | 1.30E-01 |
| | | 1384.27 | 23.94 | -6.18E-02 | | 4.01E-01 |
| + | CD-113M | 263.70 | 0.02 | -1.18E+01 | 2.22E+02 | 2.22E+02 |
| + | SN-113 | 255.12 | 1.93 | 1.50E+00 | 1.48E-01 | 4.86E+00 |
| | | 391.69 | 64.90 | -2.98E-02 | | 1.48E-01 |
| + | TE123M | 159.00 | 84.10 | 2.07E-02 | 8.73E-02 | 8.73E-02 |
| + | SB-124 | 602.71 | 97.87 | 4.01E-03 | 2.01E-01 | 2.01E-01 |
| | | 645.85 | 7.26 | -4.50E-01 | | 2.61E+00 |
| | | 722.78 | 11.10 | -6.05E-02 | | 1.82E+00 |
| | | 1691.02 | 49.00 | 1.05E-01 | | 3.66E-01 |
| + | I-125 | 35.49 | 6.49 | 2.26E+00 | 4.83E+00 | 4.83E+00 |
| + | SB-125 | 176.33 | 6.89 | -6.66E-02 | 1.97E-01 | 6.56E-01 |
| | | 427.89 | 29.33 | -8.29E-02 | | 1.97E-01 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | SB-125 | 463.38 | 10.35 | 6.65E-01 | 1.97E-01 | 6.75E-01 |
| | | 600.56 | 17.80 | -6.71E-02 | | 3.50E-01 |
| | | 635.90 | 11.32 | 3.22E-02 | | 5.83E-01 |
| + | SB-126 | 414.70 | 83.30 | 2.35E-01 | 1.54E+01 | 1.77E+01 |
| | | 666.33 | 99.60 | -1.50E+01 | | 1.54E+01 |
| | | 695.00 | 99.60 | 7.36E+00 | | 1.81E+01 |
| | | 720.50 | 53.80 | -1.14E+00 | | 2.90E+01 |
| + | SN-126 | 87.57 | 37.00 | 4.54E-02 | 1.30E-01 | 1.30E-01 |
| + | SB-127 | 473.00 | 25.00 | 3.70E+06 | 1.05E+07 | 1.34E+07 |
| | | 685.20 | 35.70 | 2.15E+06 | | 1.05E+07 |
| | | 783.80 | 14.70 | 1.90E+07 | | 2.98E+07 |
| + | I-129 | 29.78 | 57.00 | 6.54E-02 | 3.21E-01 | 3.21E-01 |
| | | 33.60 | 13.20 | -5.26E-02 | | 9.16E-01 |
| | | 39.58 | 7.52 | -3.49E-01 | | 1.03E+00 |
| + | I-131 | 284.30 | 6.05 | 1.11E+03 | 3.29E+02 | 4.56E+03 |
| | | 364.48 | 81.20 | 9.78E+01 | | 3.29E+02 |
| | | 636.97 | 7.26 | -1.08E+03 | | 4.36E+03 |
| | | 722.89 | 1.80 | -6.14E+02 | | 1.85E+04 |
| + | TE-132 | 49.72 | 13.10 | -4.29E+08 | 9.03E+07 | 6.26E+08 |
| | | 228.16 | 88.00 | 6.99E+07 | | 9.03E+07 |
| + | BA-133 | 81.00 | 33.00 | -1.79E-02 | 1.40E-01 | 1.40E-01 |
| | | 302.84 | 17.80 | -1.38E-02 | | 3.11E-01 |
| | | 356.01 | 60.00 | 1.84E-01 | | 1.41E-01 |
| + | @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | 38.00 | -7.53E+03 | 5.91E+04 | 5.91E+04 |
| + | CS-134 | 563.23 | 8.38 | 2.69E-01 | 7.81E-02 | 7.99E-01 |
| | | 569.32 | 15.43 | -7.83E-02 | | 3.91E-01 |
| | | 604.70 | 97.60 | -1.20E-02 | | 7.81E-02 |
| | | 795.84 | 85.40 | 3.81E-02 | | 9.54E-02 |
| | | 801.93 | 8.73 | 3.58E-01 | | 8.83E-01 |
| + | CS-135 | 268.24 | 16.00 | 1.59E-02 | 3.39E-01 | 3.39E-01 |
| + | @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | 7.46 | 9.50E+00 | 1.13E+01 | 1.04E+02 |
| | | 163.89 | 4.61 | -5.64E+01 | | 1.58E+02 |
| | | 176.55 | 13.56 | -5.87E+00 | | 5.78E+01 |
| | | 273.65 | 12.66 | -9.73E+00 | | 8.16E+01 |
| | | 340.57 | 48.50 | 4.56E+01 | | 2.69E+01 |
| | | 818.50 | 99.70 | -4.42E+00 | | 1.13E+01 |
| | | 1048.07 | 79.60 | -2.06E+00 | | 1.67E+01 |
| | | 1235.34 | 19.70 | 2.12E+01 | | 9.83E+01 |
| + | CS-137 | 661.65 | 85.12 | 4.96E-02 | 8.31E-02 | 8.31E-02 |
| + | LA-138 | 788.74 | 34.00 | -1.78E-02 | 9.84E-02 | 2.07E-01 |
| | | 1435.80 | 66.00 | -2.06E-02 | | 9.84E-02 |
| + | CE-139 | 165.85 | 80.35 | 1.92E-02 | 8.31E-02 | 8.31E-02 |
| + | BA-140 | 162.64 | 6.70 | -3.08E+01 | 4.82E+01 | 1.28E+02 |
| | | 304.84 | 4.50 | -1.85E+02 | | 2.54E+02 |
| | | 423.70 | 3.20 | 5.31E+01 | | 3.72E+02 |

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| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | | BA-140 | 437.55 | | 2.00 | -6.03E+01 | 4.82E+01 | 6.48E+02 |
| | | | 537.32 | | 25.00 | 1.69E+00 | | 4.82E+01 |
| + | | LA-140 | 328.77 | | 20.50 | 2.68E+01 | 1.88E+01 | 6.07E+01 |
| | | | 487.03 | | 45.50 | -1.96E+01 | | 2.70E+01 |
| | | | 815.85 | | 23.50 | -2.15E+01 | | 5.34E+01 |
| | | | 1596.49 | | 95.49 | 6.91E+00 | | 1.88E+01 |
| + | | CE-141 | 145.44 | | 48.40 | 8.29E-02 | 7.10E-01 | 7.10E-01 |
| + | @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | | CE-144 | 133.54 | | 10.80 | -4.55E-02 | 4.64E-01 | 4.64E-01 |
| + | | PM-144 | 476.78 | | 42.00 | -7.79E-02 | 7.45E-02 | 1.63E-01 |
| | | | 618.01 | | 98.60 | -5.76E-03 | | 7.45E-02 |
| | | | 696.49 | | 99.49 | -1.61E-02 | | 8.32E-02 |
| + | | PM-145 | 36.85 | | 21.70 | 1.52E-01 | 2.28E-01 | 4.22E-01 |
| | | | 37.36 | | 39.70 | 7.25E-02 | | 2.28E-01 |
| | | | 42.30 | | 15.10 | -4.83E-01 | | 4.65E-01 |
| | | | 72.40 | | 2.31 | -5.21E+00 | | 2.41E+00 |
| + | | PM-146 | 453.90 | | 39.94 | 4.62E-02 | 1.43E-01 | 1.43E-01 |
| | | | 735.90 | | 14.01 | -1.48E-01 | | 4.45E-01 |
| | | | 747.13 | | 13.10 | -3.98E-01 | | 4.95E-01 |
| + | | ND-147 | 91.11 | | 28.90 | -6.16E+01 | 8.74E+01 | 8.74E+01 |
| | | | 531.02 | | 13.10 | 6.63E+01 | | 2.19E+02 |
| + | | PM-149 | 285.90 | | 3.10 | -1.90E+12 | 5.30E+13 | 5.30E+13 |
| + | | EU-152 | 121.78 | | 20.50 | 7.11E-02 | 1.89E-01 | 1.89E-01 |
| | | | 244.69 | | 5.40 | 2.25E-01 | | 1.22E+00 |
| | | | 344.27 | | 19.13 | 3.33E-02 | | 2.96E-01 |
| | | | 778.89 | | 9.20 | -6.63E-03 | | 7.34E-01 |
| | | | 964.01 | | 10.40 | 2.89E-01 | | 7.89E-01 |
| | | | 1085.78 | | 7.22 | 7.56E-02 | | 1.14E+00 |
| | | | 1112.02 | | 9.60 | 3.44E-01 | | 9.66E-01 |
| | | | 1407.95 | | 14.94 | 2.43E-01 | | 6.07E-01 |
| + | | GD-153 | 97.43 | | 31.30 | -1.08E-01 | 1.71E-01 | 1.71E-01 |
| | | | 103.18 | | 22.20 | 8.51E-02 | | 2.28E-01 |
| + | | EU-154 | 123.07 | | 40.50 | 6.77E-02 | 9.79E-02 | 9.79E-02 |
| | | | 723.30 | | 19.70 | -1.11E-02 | | 3.35E-01 |
| | | | 873.19 | | 11.50 | 3.39E-01 | | 6.64E-01 |
| | | | 996.32 | | 10.30 | -3.44E-01 | | 7.67E-01 |
| | | | 1004.76 | | 17.90 | -2.25E-01 | | 4.12E-01 |
| | | | 1274.45 | | 35.50 | 2.63E-02 | | 2.59E-01 |
| + | | EU-155 | 86.50 | * | 30.90 | 1.30E-01 | 1.88E-01 | 2.33E-01 |
| | | | 105.30 | | 20.70 | -3.20E-02 | | 1.88E-01 |
| + | | EU-156 | 811.77 | | 10.40 | -5.85E+00 | 5.52E+01 | 5.52E+01 |
| | | | 1153.47 | | 7.20 | 1.08E+01 | | 1.16E+02 |
| | | | 1230.71 | | 8.90 | 5.14E+01 | | 9.76E+01 |
| + | | HO-166M | 184.41 | | 72.60 | 1.10E-01 | 7.24E-02 | 7.24E-02 |
| | | | 280.45 | | 29.60 | 6.02E-02 | | 1.84E-01 |
| | | | 410.94 | | 11.10 | -1.62E-02 | | 5.41E-01 |
| | | | 711.69 | | 54.10 | 1.62E-02 | | 1.23E-01 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | TM-171 | 66.72 | | 0.14 | -2.54E+01 | 3.91E+01 | 3.91E+01 |
| + | HF-172 | 67.35 | | 5.31 | -4.86E-01 | 3.76E-01 | 1.02E+00 |
| | | 125.81 | | 11.30 | 1.68E-02 | | 3.76E-01 |
| + | LU-172 | 181.53 | | 20.60 | 3.19E+02 | 3.39E+03 | 5.98E+03 |
| | | 900.72 | | 29.81 | -3.51E+02 | | 7.35E+03 |
| | | 1093.66 | | 62.50 | 3.03E+02 | | 3.39E+03 |
| + | LU-173 | 100.72 | | 5.24 | 3.03E-02 | 3.10E-01 | 8.59E-01 |
| | | 272.11 | | 21.20 | 2.51E-01 | | 3.10E-01 |
| + | HF-175 | 343.40 | | 84.00 | 2.00E-02 | 1.77E-01 | 1.77E-01 |
| + | LU-176 | 88.34 | | 13.30 | -1.23E-01 | 5.40E-02 | 3.65E-01 |
| | | 201.83 | | 86.00 | 1.37E-02 | | 5.40E-02 |
| | | 306.78 | | 94.00 | -1.04E-02 | | 5.64E-02 |
| + | HF-181 | 133.02 | | 41.70 | -1.18E-01 | 3.72E-01 | 4.73E-01 |
| | | 345.85 | | 17.20 | 1.86E-01 | | 1.63E+00 |
| | | 482.03 | | 82.80 | 1.46E-01 | | 3.72E-01 |
| + | TA-182 | 67.75 | | 41.20 | -1.03E-01 | 2.16E-01 | 2.16E-01 |
| | | 1121.30 | | 34.90 | 1.15E+00 | | 6.97E-01 |
| | | 1189.05 | | 16.23 | -9.14E-02 | | 9.64E-01 |
| | | 1221.41 | | 26.98 | -3.08E-01 | | 5.81E-01 |
| | | 1231.02 | | 11.44 | 7.90E-01 | | 1.50E+00 |
| + | IR-192 | 308.46 | | 29.68 | 2.43E-02 | 3.04E-01 | 4.51E-01 |
| | | 468.07 | | 48.10 | -1.27E-02 | | 3.04E-01 |
| + | HG-203 | 279.19 | | 77.30 | 9.33E-02 | 3.10E-01 | 3.10E-01 |
| + | TL-204 | 374.74 | | 94.11 | 1.24E-03 | 5.76E-02 | 5.76E-02 |
| | | 899.15 | | 99.16 | 2.66E-02 | | 8.37E-02 |
| | | 911.74 | | 91.10 | 2.48E-01 | | 1.39E-01 |
| + | BI-207 | 569.67 | | 97.72 | -4.41E-02 | 5.37E-02 | 5.37E-02 |
| | | 1063.62 | | 74.90 | -3.65E-02 | | 1.01E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 9.80E-01 | 2.09E-01 | 3.12E-01 |
| | | 860.37 | | 4.48 | 1.45E+00 | | 1.77E+00 |
| | | 2614.66 | * | 35.85 | 7.88E-01 | | 2.09E-01 |
| + | BI-210M | 262.00 | | 45.00 | -6.97E-03 | 1.13E-01 | 1.13E-01 |
| | | 300.00 | | 23.00 | 8.02E-02 | | 2.66E-01 |
| + | PB-210 | 46.50 | | 4.25 | 1.27E+00 | 1.57E+00 | 1.57E+00 |
| + | PB-211 | 404.84 | | 2.90 | -4.22E-01 | 1.96E+00 | 1.96E+00 |
| | | 831.96 | | 2.90 | -1.40E-01 | | 2.51E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 6.09E-01 | 9.87E-01 | 9.87E-01 |
| | | 1620.62 | | 2.75 | 5.46E-01 | | 2.47E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 8.59E-01 | 2.13E-01 | 2.13E-01 |
| | | 300.09 | | 3.41 | 5.41E-01 | | 1.80E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 1.07E+00 | 1.99E-01 | 1.99E-01 |
| | | 1120.29 | * | 15.10 | 1.39E+00 | | 7.36E-01 |
| | | 1764.49 | * | 15.80 | 1.20E+00 | | 3.58E-01 |
| | | 2204.22 | * | 4.98 | 1.17E+00 | | 9.19E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 1.05E+00 | 2.51E-01 | 4.99E-01 |
| | | 351.92 | * | 37.19 | 1.32E+00 | | 2.51E-01 |
| + | RN-219 | 401.80 | | 6.50 | -1.18E-01 | 8.64E-01 | 8.64E-01 |
| + | RA-223 | 323.87 | | 3.88 | -1.15E+00 | 1.33E+00 | 1.33E+00 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | RA-224 | 240.98 | | 3.95 | 1.30E+01 | 2.47E+00 | 2.47E+00 |
| + | RA-225 | 40.00 | | 31.00 | -8.59E+00 | 2.55E+01 | 2.55E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.95E+00 | 1.76E+00 | 1.76E+00 |
| + | TH-227 | 50.10 | | 8.40 | -4.56E-01 | 6.66E-01 | 6.66E-01 |
| | | 236.00 | | 11.50 | 3.52E-01 | | 6.72E-01 |
| | | 256.20 | | 6.30 | 4.43E-01 | | 8.25E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 7.27E-01 | 3.43E-01 | 7.11E-01 |
| | | 911.07 | * | 27.70 | 8.85E-01 | | 3.43E-01 |
| | | 969.11 | * | 16.60 | 6.01E-01 | | 6.23E-01 |
| + | TH-230 | 48.44 | | 16.90 | 9.57E-02 | 3.63E-01 | 3.63E-01 |
| | | 62.85 | | 4.60 | 1.03E+00 | | 1.16E+00 |
| | | 67.67 | | 0.37 | -6.29E+00 | | 1.32E+01 |
| + | PA-231 | 283.67 | | 1.60 | -3.16E-02 | 2.37E+00 | 3.28E+00 |
| | | 302.67 | | 2.30 | -1.05E-01 | | 2.37E+00 |
| + | TH-231 | 25.64 | | 14.70 | 4.42E-01 | 7.31E-01 | 2.31E+00 |
| | | 84.21 | | 6.40 | 2.97E-03 | | 7.31E-01 |
| + | PA-233 | 311.98 | | 38.60 | 4.23E-01 | 1.83E+00 | 1.83E+00 |
| + | PA-234 | 131.20 | | 20.40 | 1.62E-01 | 2.02E-01 | 2.02E-01 |
| | | 733.99 | | 8.80 | -1.30E-01 | | 7.12E-01 |
| | | 946.00 | | 12.00 | 1.02E-01 | | 6.05E-01 |
| + | PA-234M | 1001.03 | | 0.92 | 2.26E+00 | 8.51E+00 | 8.51E+00 |
| + | TH-234 | 63.29 | | 3.80 | 1.48E+00 | 1.41E+00 | 1.41E+00 |
| + | U-235 | 143.76 | | 10.50 | 4.54E-02 | 3.91E-01 | 3.91E-01 |
| | | 163.35 | | 4.70 | -2.98E-01 | | 8.34E-01 |
| | | 205.31 | | 4.70 | -6.79E-01 | | 1.16E+00 |
| + | NP-237 | 86.50 | * | 12.60 | 3.08E-01 | 5.50E-01 | 5.50E-01 |
| + | NP-239 | 106.10 | | 22.70 | -1.33E+11 | 7.84E+11 | 7.84E+11 |
| | | 228.18 | | 10.70 | 1.88E+12 | | 2.42E+12 |
| | | 277.60 | | 14.10 | -2.39E+11 | | 1.80E+12 |
| + | AM-241 | 59.54 | | 35.90 | -2.67E-02 | 1.42E-01 | 1.42E-01 |
| + | AM-243 | 74.67 | | 66.00 | 1.02E-01 | 9.81E-02 | 9.81E-02 |
| + | CM-243 | 209.75 | | 3.29 | 7.19E-01 | 3.86E-01 | 1.69E+00 |
| | | 228.14 | | 10.60 | 4.03E-01 | | 5.21E-01 |
| | | 277.60 | | 14.00 | -5.12E-02 | | 3.86E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

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# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.97E+00 | 1.97E+00 | -1.16E+00 | 9.33E-01 |
| | NA-22 | 1274.54 | | 99.94 | 9.68E-02 | 9.68E-02 | 9.83E-03 | 4.46E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 6.51E-02 | 6.51E-02 | 4.32E-03 | 2.79E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 9.62E-01 | 9.62E-01 | 1.56E+01 | 4.44E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 5.17E-02 | 5.17E-02 | -2.47E-02 | 2.53E-02 |
| | | 78.34 | | 96.00 | 6.51E-02 | | 1.74E-01 | 3.21E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.58E-01 | 1.58E-01 | -4.97E-02 | 7.28E-02 |
| | | 1120.51 | | 99.99 | 3.06E-01 | | 5.01E-01 | 1.46E-01 |
| | V-48 | 983.52 | | 99.98 | 5.71E+00 | 5.58E+00 | 3.57E+00 | 2.64E+00 |
| | | 1312.10 | | 97.50 | 5.58E+00 | | -1.43E+00 | 2.51E+00 |
| | CR-51 | 320.08 | | 9.83 | 6.32E+00 | 6.32E+00 | -2.15E+00 | 3.03E+00 |
| + | MN-54 | 834.83 | * | 99.97 | 7.13E-02 | 7.13E-02 | 3.76E-02 | 3.26E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.61E-01 | 1.61E-01 | 2.21E-03 | 7.43E-02 |
| | | 1037.75 | | 14.03 | 1.22E+00 | | 1.68E-01 | 5.61E-01 |
| | | 1238.25 | | 67.00 | 3.99E-01 | | 1.82E-01 | 1.87E-01 |
| | | 1771.40 | | 15.51 | 9.87E-01 | | -3.93E-02 | 4.23E-01 |
| | | 2598.48 | | 16.90 | 5.69E-01 | | -1.43E-01 | 2.01E-01 |
| | CO-57 | 122.06 | | 85.51 | 5.77E-02 | 5.77E-02 | 2.17E-02 | 2.80E-02 |
| | | 136.48 | | 10.60 | 4.76E-01 | | 1.25E-01 | 2.31E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.68E-01 | 1.68E-01 | 8.79E-03 | 7.78E-02 |
| | FE-59 | 1099.22 | | 56.50 | 6.50E-01 | 6.50E-01 | -1.28E-01 | 2.99E-01 |
| | | 1291.56 | | 43.20 | 8.67E-01 | | -7.46E-02 | 3.95E-01 |
| | CO-60 | 1173.22 | | 100.00 | 8.62E-02 | 8.62E-02 | -3.41E-02 | 3.97E-02 |
| | | 1332.49 | | 100.00 | 8.86E-02 | | -2.71E-03 | 4.05E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 2.20E-01 | 2.20E-01 | 3.76E-03 | 1.02E-01 |
| | GA-67 | 93.31 | | 35.70 | 1.94E+08 | 1.94E+08 | 2.82E+08 | 9.50E+07 |
| | | 208.95 | | 2.24 | 3.54E+09 | | 2.47E+09 | 1.73E+09 |
| | | 300.22 | | 16.00 | 5.46E+08 | | 1.64E+08 | 2.64E+08 |
| | SE-75 | 121.11 | | 16.70 | 3.93E-01 | 1.15E-01 | -8.19E-02 | 1.91E-01 |
| | | 136.00 | | 59.20 | 1.15E-01 | | -4.44E-02 | 5.58E-02 |
| | | 264.65 | | 59.80 | 1.49E-01 | | 3.02E-02 | 7.21E-02 |
| | | 279.53 | | 25.20 | 3.87E-01 | | 1.63E-01 | 1.87E-01 |
| | | 400.65 | | 11.40 | 9.00E-01 | | 2.11E-01 | 4.30E-01 |
| | RB-82 | 776.52 | | 13.00 | 6.98E+00 | 6.98E+00 | -4.31E+00 | 3.23E+00 |
| | RB-83 | 520.41 | | 46.00 | 2.88E-01 | 2.88E-01 | 2.83E-02 | 1.36E-01 |
| | | 529.64 | | 30.30 | 3.90E-01 | | -1.34E-01 | 1.83E-01 |
| | | 552.65 | | 16.40 | 7.79E-01 | | -3.75E-01 | 3.67E-01 |
| | KR-85 | 513.99 | | 0.43 | 1.91E+01 | 1.91E+01 | 3.76E-01 | 9.17E+00 |
| | SR-85 | 513.99 | | 99.27 | 2.37E-01 | 2.37E-01 | 4.66E-03 | 1.14E-01 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| Y-88 | 898.02 | 93.40 | 1.62E-01 | 1.11E-01 | 8.66E-02 | 7.57E-02 |
| | 1836.01 | 99.38 | 1.11E-01 | | 1.78E-02 | 4.67E-02 |
| MO-93 | 263.06 | 56.72 | 9.02E-02 | 6.48E-02 | -4.40E-03 | 4.35E-02 |
| | 684.67 | 99.68 | 6.76E-02 | | 1.38E-02 | 3.17E-02 |
| | 1477.11 | 99.08 | 6.48E-02 | | 6.46E-03 | 2.83E-02 |
| NB-93M | 16.57 | 9.43 | 5.64E+01 | 5.64E+01 | 2.68E+00 | 2.75E+01 |
| NB-94 | 702.63 | 100.00 | 6.94E-02 | 6.94E-02 | 1.81E-02 | 3.26E-02 |
| | 871.10 | 100.00 | 7.12E-02 | | 6.64E-03 | 3.30E-02 |
| NB-95 | 765.79 | 99.81 | 5.93E-01 | 5.93E-01 | 1.44E-01 | 2.80E-01 |
| NB-95M | 235.69 | 25.00 | 5.73E+07 | 5.73E+07 | 3.00E+07 | 2.81E+07 |
| ZR-95 | 724.18 | 43.70 | 4.94E-01 | 3.56E-01 | -2.13E-03 | 2.33E-01 |
| | 756.72 | 55.30 | 3.56E-01 | | 5.79E-03 | 1.66E-01 |
| MO-99 | 181.06 | 6.20 | 4.90E+10 | 3.76E+10 | -1.83E+09 | 2.38E+10 |
| | 739.58 | 12.80 | 3.76E+10 | | 1.39E+10 | 1.76E+10 |
| | 778.00 | 4.50 | 1.02E+11 | | 1.14E+09 | 4.75E+10 |
| RU-103 | 497.08 | 89.00 | 3.73E-01 | 3.73E-01 | -2.37E-02 | 1.76E-01 |
| RU-106 | 621.84 | 9.80 | 7.14E-01 | 7.14E-01 | -7.95E-02 | 3.34E-01 |
| AG-108M | 433.93 | 89.90 | 6.92E-02 | 6.92E-02 | 3.39E-02 | 3.31E-02 |
| | 614.37 | 90.40 | 8.74E-02 | | -3.08E-03 | 4.16E-02 |
| | 722.95 | 90.50 | 7.15E-02 | | -2.37E-03 | 3.34E-02 |
| CD-109 | 88.03 | 3.72 | 1.50E+00 | 1.50E+00 | 5.24E-01 | 7.36E-01 |
| AG-110M | 657.75 | 93.14 | 8.75E-02 | 8.75E-02 | -1.02E-01 | 4.09E-02 |
| | 677.61 | 10.53 | 8.31E-01 | | -8.49E-02 | 3.90E-01 |
| | 706.67 | 16.46 | 5.87E-01 | | 4.20E-01 | 2.77E-01 |
| | 763.93 | 21.98 | 4.24E-01 | | 5.82E-02 | 1.98E-01 |
| | 884.67 | 71.63 | 1.30E-01 | | 1.77E-03 | 6.04E-02 |
| | 1384.27 | 23.94 | 4.01E-01 | | -6.18E-02 | 1.80E-01 |
| CD-113M | 263.70 | 0.02 | 2.22E+02 | 2.22E+02 | -1.18E+01 | 1.07E+02 |
| SN-113 | 255.12 | 1.93 | 4.86E+00 | 1.48E-01 | 1.50E+00 | 2.35E+00 |
| | 391.69 | 64.90 | 1.48E-01 | | -2.98E-02 | 7.06E-02 |
| TE123M | 159.00 | 84.10 | 8.73E-02 | 8.73E-02 | 2.07E-02 | 4.24E-02 |
| SB-124 | 602.71 | 97.87 | 2.01E-01 | 2.01E-01 | 4.01E-03 | 9.48E-02 |
| | 645.85 | 7.26 | 2.61E+00 | | -4.50E-01 | 1.22E+00 |
| | 722.78 | 11.10 | 1.82E+00 | | -6.05E-02 | 8.51E-01 |
| | 1691.02 | 49.00 | 3.66E-01 | | 1.05E-01 | 1.54E-01 |
| I-125 | 35.49 | 6.49 | 4.83E+00 | 4.83E+00 | 2.26E+00 | 2.35E+00 |
| SB-125 | 176.33 | 6.89 | 6.56E-01 | 1.97E-01 | -6.66E-02 | 3.18E-01 |
| | 427.89 | 29.33 | 1.97E-01 | | -8.29E-02 | 9.36E-02 |
| | 463.38 | 10.35 | 6.75E-01 | | 6.65E-01 | 3.23E-01 |
| | 600.56 | 17.80 | 3.50E-01 | | -6.71E-02 | 1.64E-01 |
| | 635.90 | 11.32 | 5.83E-01 | | 3.22E-02 | 2.73E-01 |
| SB-126 | 414.70 | 83.30 | 1.77E+01 | 1.54E+01 | 2.35E-01 | 8.43E+00 |
| | 666.33 | 99.60 | 1.54E+01 | | -1.50E+01 | 7.19E+00 |
| | 695.00 | 99.60 | 1.81E+01 | | 7.36E+00 | 8.53E+00 |
| | 720.50 | 53.80 | 2.90E+01 | | -1.14E+00 | 1.35E+01 |
| SN-126 | 87.57 | 37.00 | 1.30E-01 | 1.30E-01 | 4.54E-02 | 6.38E-02 |
| SB-127 | 473.00 | 25.00 | 1.34E+07 | 1.05E+07 | 3.70E+06 | 6.39E+06 |
| | 685.20 | 35.70 | 1.05E+07 | | 2.15E+06 | 4.93E+06 |
| | 783.80 | 14.70 | 2.98E+07 | | 1.90E+07 | 1.40E+07 |
| I-129 | 29.78 | 57.00 | 3.21E-01 | 3.21E-01 | 6.54E-02 | 1.56E-01 |
| | 33.60 | 13.20 | 9.16E-01 | | -5.26E-02 | 4.46E-01 |
| | 39.58 | 7.52 | 1.03E+00 | | -3.49E-01 | 5.03E-01 |
| I-131 | 284.30 | 6.05 | 4.56E+03 | 3.29E+02 | 1.11E+03 | 2.20E+03 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| I-131 | 364.48 | 81.20 | 3.29E+02 | 3.29E+02 | 9.78E+01 | 1.57E+02 |
| | 636.97 | 7.26 | 4.36E+03 | | -1.08E+03 | 2.04E+03 |
| | 722.89 | 1.80 | 1.85E+04 | | -6.14E+02 | 8.64E+03 |
| TE-132 | 49.72 | 13.10 | 6.26E+08 | 9.03E+07 | -4.29E+08 | 3.05E+08 |
| | 228.16 | 88.00 | 9.03E+07 | | 6.99E+07 | 4.38E+07 |
| BA-133 | 81.00 | 33.00 | 1.40E-01 | 1.40E-01 | -1.79E-02 | 6.87E-02 |
| | 302.84 | 17.80 | 3.11E-01 | | -1.38E-02 | 1.50E-01 |
| | 356.01 | 60.00 | 1.41E-01 | | 1.84E-01 | 6.83E-02 |
| @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| XE-133 | 81.00 | 38.00 | 5.91E+04 | 5.91E+04 | -7.53E+03 | 2.89E+04 |
| CS-134 | 563.23 | 8.38 | 7.99E-01 | 7.81E-02 | 2.69E-01 | 3.77E-01 |
| | 569.32 | 15.43 | 3.91E-01 | | -7.83E-02 | 1.83E-01 |
| | 604.70 | 97.60 | 7.81E-02 | | -1.20E-02 | 3.70E-02 |
| | 795.84 | 85.40 | 9.54E-02 | | 3.81E-02 | 4.46E-02 |
| | 801.93 | 8.73 | 8.83E-01 | | 3.58E-01 | 4.12E-01 |
| CS-135 | 268.24 | 16.00 | 3.39E-01 | 3.39E-01 | 1.59E-02 | 1.64E-01 |
| @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CS-136 | 153.22 | 7.46 | 1.04E+02 | 1.13E+01 | 9.50E+00 | 5.06E+01 |
| | 163.89 | 4.61 | 1.58E+02 | | -5.64E+01 | 7.65E+01 |
| | 176.55 | 13.56 | 5.78E+01 | | -5.87E+00 | 2.80E+01 |
| | 273.65 | 12.66 | 8.16E+01 | | -9.73E+00 | 3.95E+01 |
| | 340.57 | 48.50 | 2.69E+01 | | 4.56E+01 | 1.30E+01 |
| | 818.50 | 99.70 | 1.13E+01 | | -4.42E+00 | 5.21E+00 |
| | 1048.07 | 79.60 | 1.67E+01 | | -2.06E+00 | 7.64E+00 |
| | 1235.34 | 19.70 | 9.83E+01 | | 2.12E+01 | 4.59E+01 |
| CS-137 | 661.65 | 85.12 | 8.31E-02 | 8.31E-02 | 4.96E-02 | 3.92E-02 |
| LA-138 | 788.74 | 34.00 | 2.07E-01 | 9.84E-02 | -1.78E-02 | 9.66E-02 |
| | 1435.80 | 66.00 | 9.84E-02 | | -2.06E-02 | 4.33E-02 |
| CE-139 | 165.85 | 80.35 | 8.31E-02 | 8.31E-02 | 1.92E-02 | 4.03E-02 |
| BA-140 | 162.64 | 6.70 | 1.28E+02 | 4.82E+01 | -3.08E+01 | 6.19E+01 |
| | 304.84 | 4.50 | 2.54E+02 | | -1.85E+02 | 1.22E+02 |
| | 423.70 | 3.20 | 3.72E+02 | | 5.31E+01 | 1.77E+02 |
| | 437.55 | 2.00 | 6.48E+02 | | -6.03E+01 | 3.09E+02 |
| | 537.32 | 25.00 | 4.82E+01 | | 1.69E+00 | 2.27E+01 |
| LA-140 | 328.77 | 20.50 | 6.07E+01 | 1.88E+01 | 2.68E+01 | 2.92E+01 |
| | 487.03 | 45.50 | 2.70E+01 | | -1.96E+01 | 1.28E+01 |
| | 815.85 | 23.50 | 5.34E+01 | | -2.15E+01 | 2.45E+01 |
| | 1596.49 | 95.49 | 1.88E+01 | | 6.91E+00 | 8.42E+00 |
| CE-141 | 145.44 | 48.40 | 7.10E-01 | 7.10E-01 | 8.29E-02 | 3.45E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 4.64E-01 | 4.64E-01 | -4.55E-02 | 2.25E-01 |
| PM-144 | 476.78 | 42.00 | 1.63E-01 | 7.45E-02 | -7.79E-02 | 7.72E-02 |
| | 618.01 | 98.60 | 7.45E-02 | | -5.76E-03 | 3.49E-02 |
| | 696.49 | 99.49 | 8.32E-02 | | -1.61E-02 | 3.90E-02 |
| PM-145 | 36.85 | 21.70 | 4.22E-01 | 2.28E-01 | 1.52E-01 | 2.05E-01 |
| | 37.36 | 39.70 | 2.28E-01 | | 7.25E-02 | 1.11E-01 |
| | 42.30 | 15.10 | 4.65E-01 | | -4.83E-01 | 2.27E-01 |
| | 72.40 | 2.31 | 2.41E+00 | | -5.21E+00 | 1.18E+00 |
| PM-146 | 453.90 | 39.94 | 1.43E-01 | 1.43E-01 | 4.62E-02 | 6.80E-02 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | PM-146 | 735.90 | | 14.01 | 4.45E-01 | 1.43E-01 | -1.48E-01 | 2.06E-01 |
| | | 747.13 | | 13.10 | 4.95E-01 | | -3.98E-01 | 2.30E-01 |
| | ND-147 | 91.11 | | 28.90 | 8.74E+01 | 8.74E+01 | -6.16E+01 | 4.28E+01 |
| | | 531.02 | | 13.10 | 2.19E+02 | | 6.63E+01 | 1.03E+02 |
| | PM-149 | 285.90 | | 3.10 | 5.30E+13 | 5.30E+13 | -1.90E+12 | 2.55E+13 |
| | EU-152 | 121.78 | | 20.50 | 1.89E-01 | 1.89E-01 | 7.11E-02 | 9.19E-02 |
| | | 244.69 | | 5.40 | 1.22E+00 | | 2.25E-01 | 5.95E-01 |
| | | 344.27 | | 19.13 | 2.96E-01 | | 3.33E-02 | 1.42E-01 |
| | | 778.89 | | 9.20 | 7.34E-01 | | -6.63E-03 | 3.41E-01 |
| | | 964.01 | | 10.40 | 7.89E-01 | | 2.89E-01 | 3.67E-01 |
| | | 1085.78 | | 7.22 | 1.14E+00 | | 7.56E-02 | 5.25E-01 |
| | | 1112.02 | | 9.60 | 9.66E-01 | | 3.44E-01 | 4.50E-01 |
| | | 1407.95 | | 14.94 | 6.07E-01 | | 2.43E-01 | 2.77E-01 |
| | GD-153 | 97.43 | | 31.30 | 1.71E-01 | 1.71E-01 | -1.08E-01 | 8.36E-02 |
| | | 103.18 | | 22.20 | 2.28E-01 | | 8.51E-02 | 1.11E-01 |
| | EU-154 | 123.07 | | 40.50 | 9.79E-02 | 9.79E-02 | 6.77E-02 | 4.76E-02 |
| | | 723.30 | | 19.70 | 3.35E-01 | | -1.11E-02 | 1.56E-01 |
| | | 873.19 | | 11.50 | 6.64E-01 | | 3.39E-01 | 3.09E-01 |
| | | 996.32 | | 10.30 | 7.67E-01 | | -3.44E-01 | 3.55E-01 |
| | | 1004.76 | | 17.90 | 4.12E-01 | | -2.25E-01 | 1.89E-01 |
| | | 1274.45 | | 35.50 | 2.59E-01 | | 2.63E-02 | 1.19E-01 |
| + | EU-155 | 86.50 | * | 30.90 | 2.33E-01 | 1.88E-01 | 1.30E-01 | 1.15E-01 |
| | | 105.30 | | 20.70 | 1.88E-01 | | -3.20E-02 | 9.17E-02 |
| | EU-156 | 811.77 | | 10.40 | 5.52E+01 | 5.52E+01 | -5.85E+00 | 2.55E+01 |
| | | 1153.47 | | 7.20 | 1.16E+02 | | 1.08E+01 | 5.39E+01 |
| | | 1230.71 | | 8.90 | 9.76E+01 | | 5.14E+01 | 4.52E+01 |
| | HO-166M | 184.41 | | 72.60 | 7.24E-02 | 7.24E-02 | 1.10E-01 | 3.53E-02 |
| | | 280.45 | | 29.60 | 1.84E-01 | | 6.02E-02 | 8.87E-02 |
| | | 410.94 | | 11.10 | 5.41E-01 | | -1.62E-02 | 2.59E-01 |
| | | 711.69 | | 54.10 | 1.23E-01 | | 1.62E-02 | 5.74E-02 |
| | TM-171 | 66.72 | | 0.14 | 3.91E+01 | 3.91E+01 | -2.54E+01 | 1.92E+01 |
| | HF-172 | 67.35 | | 5.31 | 1.02E+00 | 3.76E-01 | -4.86E-01 | 4.98E-01 |
| | | 125.81 | | 11.30 | 3.76E-01 | | 1.68E-02 | 1.83E-01 |
| | LU-172 | 181.53 | | 20.60 | 5.98E+03 | 3.39E+03 | 3.19E+02 | 2.90E+03 |
| | | 900.72 | | 29.81 | 7.35E+03 | | -3.51E+02 | 3.42E+03 |
| | | 1093.66 | | 62.50 | 3.39E+03 | | 3.03E+02 | 1.55E+03 |
| | LU-173 | 100.72 | | 5.24 | 8.59E-01 | 3.10E-01 | 3.03E-02 | 4.19E-01 |
| | | 272.11 | | 21.20 | 3.10E-01 | | 2.51E-01 | 1.50E-01 |
| | HF-175 | 343.40 | | 84.00 | 1.77E-01 | 1.77E-01 | 2.00E-02 | 8.50E-02 |
| | LU-176 | 88.34 | | 13.30 | 3.65E-01 | 5.40E-02 | -1.23E-01 | 1.79E-01 |
| | | 201.83 | | 86.00 | 5.40E-02 | | 1.37E-02 | 2.62E-02 |
| | | 306.78 | | 94.00 | 5.64E-02 | | -1.04E-02 | 2.71E-02 |
| | HF-181 | 133.02 | | 41.70 | 4.73E-01 | 3.72E-01 | -1.18E-01 | 2.30E-01 |
| | | 345.85 | | 17.20 | 1.63E+00 | | 1.86E-01 | 7.84E-01 |
| | | 482.03 | | 82.80 | 3.72E-01 | | 1.46E-01 | 1.77E-01 |
| | TA-182 | 67.75 | | 41.20 | 2.16E-01 | 2.16E-01 | -1.03E-01 | 1.05E-01 |
| | | 1121.30 | | 34.90 | 6.97E-01 | | 1.15E+00 | 3.32E-01 |
| | | 1189.05 | | 16.23 | 9.64E-01 | | -9.14E-02 | 4.44E-01 |
| | | 1221.41 | | 26.98 | 5.81E-01 | | -3.08E-01 | 2.67E-01 |
| | | 1231.02 | | 11.44 | 1.50E+00 | | 7.90E-01 | 6.95E-01 |
| | IR-192 | 308.46 | | 29.68 | 4.51E-01 | 3.04E-01 | 2.43E-02 | 2.17E-01 |
| | | 468.07 | | 48.10 | 3.04E-01 | | -1.27E-02 | 1.44E-01 |
| | HG-203 | 279.19 | | 77.30 | 3.10E-01 | 3.10E-01 | 9.33E-02 | 1.50E-01 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TL-204 | 374.74 | | 94.11 | 5.76E-02 | 5.76E-02 | 1.24E-03 | 2.74E-02 |
| | | 899.15 | | 99.16 | 8.37E-02 | | 2.66E-02 | 3.91E-02 |
| | | 911.74 | | 91.10 | 1.39E-01 | | 2.48E-01 | 6.64E-02 |
| | BI-207 | 569.67 | | 97.72 | 5.37E-02 | 5.37E-02 | -4.41E-02 | 2.50E-02 |
| | | 1063.62 | | 74.90 | 1.01E-01 | | -3.65E-02 | 4.62E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 3.12E-01 | 2.09E-01 | 9.80E-01 | 1.50E-01 |
| | | 860.37 | | 4.48 | 1.77E+00 | | 1.45E+00 | 8.27E-01 |
| | | 2614.66 | * | 35.85 | 2.09E-01 | | 7.88E-01 | 8.83E-02 |
| | BI-210M | 262.00 | | 45.00 | 1.13E-01 | 1.13E-01 | -6.97E-03 | 5.47E-02 |
| | | 300.00 | | 23.00 | 2.66E-01 | | 8.02E-02 | 1.29E-01 |
| | PB-210 | 46.50 | | 4.25 | 1.57E+00 | 1.57E+00 | 1.27E+00 | 7.68E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.96E+00 | 1.96E+00 | -4.22E-01 | 9.34E-01 |
| | | 831.96 | | 2.90 | 2.51E+00 | | -1.40E-01 | 1.17E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 9.87E-01 | 9.87E-01 | 6.09E-01 | 4.75E-01 |
| | | 1620.62 | | 2.75 | 2.47E+00 | | 5.46E-01 | 1.08E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 2.13E-01 | 2.13E-01 | 8.59E-01 | 1.05E-01 |
| | | 300.09 | | 3.41 | 1.80E+00 | | 5.41E-01 | 8.70E-01 |
| + | BI-214 | 609.31 | * | 46.30 | 1.99E-01 | 1.99E-01 | 1.07E+00 | 9.56E-02 |
| | | 1120.29 | * | 15.10 | 7.36E-01 | | 1.39E+00 | 3.47E-01 |
| | | 1764.49 | * | 15.80 | 3.58E-01 | | 1.20E+00 | 1.50E-01 |
| | | 2204.22 | * | 4.98 | 9.19E-01 | | 1.17E+00 | 3.52E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 4.99E-01 | 2.51E-01 | 1.05E+00 | 2.45E-01 |
| | | 351.92 | * | 37.19 | 2.51E-01 | | 1.32E+00 | 1.23E-01 |
| | RN-219 | 401.80 | | 6.50 | 8.64E-01 | 8.64E-01 | -1.18E-01 | 4.12E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.33E+00 | 1.33E+00 | -1.15E+00 | 6.39E-01 |
| | RA-224 | 240.98 | | 3.95 | 2.47E+00 | 2.47E+00 | 1.30E+01 | 1.21E+00 |
| | RA-225 | 40.00 | | 31.00 | 2.55E+01 | 2.55E+01 | -8.59E+00 | 1.24E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.76E+00 | 1.76E+00 | 2.95E+00 | 8.58E-01 |
| | TH-227 | 50.10 | | 8.40 | 6.66E-01 | 6.66E-01 | -4.56E-01 | 3.25E-01 |
| | | 236.00 | | 11.50 | 6.72E-01 | | 3.52E-01 | 3.29E-01 |
| | | 256.20 | | 6.30 | 8.25E-01 | | 4.43E-01 | 3.99E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 7.11E-01 | 3.43E-01 | 7.27E-01 | 3.46E-01 |
| | | 911.07 | * | 27.70 | 3.43E-01 | | 8.85E-01 | 1.62E-01 |
| | | 969.11 | * | 16.60 | 6.23E-01 | | 6.01E-01 | 2.95E-01 |
| | TH-230 | 48.44 | | 16.90 | 3.63E-01 | 3.63E-01 | 9.57E-02 | 1.77E-01 |
| | | 62.85 | | 4.60 | 1.16E+00 | | 1.03E+00 | 5.68E-01 |
| | | 67.67 | | 0.37 | 1.32E+01 | | -6.29E+00 | 6.45E+00 |
| | PA-231 | 283.67 | | 1.60 | 3.28E+00 | 2.37E+00 | -3.16E-02 | 1.58E+00 |
| | | 302.67 | | 2.30 | 2.37E+00 | | -1.05E-01 | 1.14E+00 |
| | TH-231 | 25.64 | | 14.70 | 2.31E+00 | 7.31E-01 | 4.42E-01 | 1.12E+00 |
| | | 84.21 | | 6.40 | 7.31E-01 | | 2.97E-03 | 3.58E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.83E+00 | 1.83E+00 | 4.23E-01 | 8.83E-01 |
| | PA-234 | 131.20 | | 20.40 | 2.02E-01 | 2.02E-01 | 1.62E-01 | 9.86E-02 |
| | | 733.99 | | 8.80 | 7.12E-01 | | -1.30E-01 | 3.31E-01 |
| | | 946.00 | | 12.00 | 6.05E-01 | | 1.02E-01 | 2.79E-01 |
| | PA-234M | 1001.03 | | 0.92 | 8.51E+00 | 8.51E+00 | 2.26E+00 | 3.94E+00 |
| | TH-234 | 63.29 | | 3.80 | 1.41E+00 | 1.41E+00 | 1.48E+00 | 6.89E-01 |
| | U-235 | 143.76 | | 10.50 | 3.91E-01 | 3.91E-01 | 4.54E-02 | 1.90E-01 |
| | | 163.35 | | 4.70 | 8.34E-01 | | -2.98E-01 | 4.04E-01 |
| | | 205.31 | | 4.70 | 1.16E+00 | | -6.79E-01 | 5.67E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 5.50E-01 | 5.50E-01 | 3.08E-01 | 2.71E-01 |
| | NP-239 | 106.10 | | 22.70 | 7.84E+11 | 7.84E+11 | -1.33E+11 | 3.82E+11 |
| | | 228.18 | | 10.70 | 2.42E+12 | | 1.88E+12 | 1.18E+12 |

Analysis Report for 1707087-06

HTC-A03-S002-1218-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| NP-239 | 277.60 | 14.10 | 1.80E+12 | 7.84E+11 | -2.39E+11 | 8.71E+11 |
| AM-241 | 59.54 | 35.90 | 1.42E-01 | 1.42E-01 | -2.67E-02 | 6.94E-02 |
| AM-243 | 74.67 | 66.00 | 9.81E-02 | 9.81E-02 | 1.02E-01 | 4.83E-02 |
| CM-243 | 209.75 | 3.29 | 1.69E+00 | 3.86E-01 | 7.19E-01 | 8.22E-01 |
| | 228.14 | 10.60 | 5.21E-01 | | 4.03E-01 | 2.53E-01 |
| | 277.60 | 14.00 | 3.86E-01 | | -5.12E-02 | 1.86E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-1218-01

Elapsed Live time: 3600
Elapsed Real Time: 3608

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 5 | 180 | 164 | 124 | 138 | 123 | 109 | 106 |
| 17: | 108 | 100 | 89 | 88 | 78 | 89 | 85 | 100 |
| 25: | 86 | 97 | 98 | 91 | 94 | 90 | 78 | 116 |
| 33: | 106 | 82 | 67 | 87 | 101 | 91 | 83 | 90 |
| 41: | 95 | 88 | 93 | 100 | 99 | 135 | 152 | 124 |
| 49: | 100 | 105 | 114 | 100 | 106 | 117 | 127 | 123 |
| 57: | 105 | 123 | 135 | 131 | 126 | 146 | 159 | 209 |
| 65: | 151 | 137 | 136 | 171 | 143 | 134 | 160 | 161 |
| 73: | 166 | 206 | 292 | 305 | 429 | 448 | 195 | 126 |
| 81: | 129 | 131 | 127 | 134 | 173 | 143 | 179 | 192 |
| 89: | 142 | 149 | 154 | 154 | 208 | 228 | 125 | 101 |
| 97: | 95 | 122 | 121 | 112 | 104 | 70 | 108 | 89 |
| 105: | 108 | 102 | 77 | 84 | 101 | 98 | 94 | 102 |
| 113: | 90 | 109 | 92 | 90 | 81 | 85 | 66 | 71 |
| 121: | 105 | 73 | 90 | 92 | 81 | 81 | 75 | 93 |
| 129: | 89 | 116 | 84 | 98 | 84 | 63 | 84 | 89 |
| 137: | 78 | 75 | 79 | 83 | 72 | 77 | 88 | 91 |
| 145: | 92 | 72 | 90 | 79 | 76 | 89 | 98 | 76 |
| 153: | 72 | 72 | 88 | 84 | 71 | 76 | 79 | 76 |
| 161: | 74 | 59 | 62 | 68 | 72 | 64 | 70 | 67 |
| 169: | 64 | 69 | 81 | 65 | 56 | 64 | 72 | 67 |
| 177: | 76 | 60 | 65 | 79 | 73 | 53 | 67 | 70 |
| 185: | 80 | 130 | 153 | 94 | 50 | 69 | 68 | 57 |
| 193: | 55 | 76 | 60 | 77 | 65 | 66 | 56 | 67 |
| 201: | 65 | 72 | 76 | 58 | 67 | 62 | 67 | 58 |
| 209: | 72 | 99 | 58 | 49 | 50 | 53 | 56 | 48 |
| 217: | 58 | 55 | 64 | 63 | 50 | 38 | 48 | 40 |
| 225: | 48 | 62 | 59 | 48 | 52 | 62 | 58 | 45 |
| 233: | 47 | 48 | 48 | 49 | 65 | 151 | 335 | 237 |
| 241: | 114 | 130 | 118 | 70 | 38 | 38 | 49 | 48 |
| 249: | 39 | 39 | 27 | 45 | 35 | 41 | 39 | 38 |
| 257: | 48 | 38 | 47 | 33 | 34 | 32 | 42 | 35 |
| 265: | 41 | 38 | 32 | 33 | 36 | 59 | 50 | 48 |
| 273: | 44 | 41 | 37 | 34 | 40 | 57 | 29 | 38 |
| 281: | 31 | 46 | 35 | 32 | 36 | 30 | 34 | 39 |
| 289: | 33 | 32 | 31 | 30 | 38 | 52 | 137 | 191 |
| 297: | 73 | 41 | 33 | 41 | 34 | 54 | 28 | 23 |
| 305: | 30 | 24 | 26 | 34 | 36 | 43 | 24 | 26 |
| 313: | 38 | 27 | 37 | 35 | 27 | 32 | 30 | 26 |
| 321: | 27 | 26 | 24 | 26 | 28 | 19 | 36 | 39 |
| 329: | 41 | 31 | 26 | 35 | 25 | 32 | 29 | 19 |
| 337: | 32 | 58 | 95 | 50 | 30 | 31 | 25 | 33 |
| 345: | 30 | 20 | 26 | 22 | 35 | 33 | 96 | 209 |
| 353: | 222 | 76 | 32 | 27 | 17 | 28 | 13 | 19 |
| 361: | 16 | 20 | 24 | 20 | 17 | 22 | 21 | 26 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 21 | 19 | 22 | 14 | 21 | 22 | 15 | 21 |

Sample Title: HTC-A03-S002-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 24 | 24 | 16 | 23 | 29 | 20 | 28 | 19 |
| 385: | 18 | 18 | 18 | 22 | 26 | 23 | 16 | 15 |
| 393: | 23 | 19 | 15 | 23 | 21 | 26 | 21 | 24 |
| 401: | 25 | 19 | 27 | 16 | 16 | 23 | 20 | 28 |
| 409: | 16 | 28 | 22 | 28 | 24 | 17 | 35 | 15 |
| 417: | 13 | 15 | 15 | 22 | 24 | 19 | 17 | 19 |
| 425: | 17 | 17 | 16 | 14 | 19 | 23 | 15 | 21 |
| 433: | 24 | 25 | 27 | 23 | 23 | 14 | 18 | 18 |
| 441: | 22 | 21 | 18 | 22 | 15 | 13 | 14 | 14 |
| 449: | 20 | 10 | 15 | 15 | 15 | 14 | 22 | 23 |
| 457: | 10 | 15 | 11 | 12 | 18 | 21 | 32 | 34 |
| 465: | 18 | 19 | 13 | 18 | 12 | 23 | 15 | 20 |
| 473: | 17 | 19 | 14 | 14 | 13 | 18 | 13 | 18 |
| 481: | 19 | 20 | 23 | 13 | 18 | 10 | 18 | 15 |
| 489: | 18 | 14 | 19 | 20 | 14 | 11 | 16 | 19 |
| 497: | 14 | 16 | 14 | 15 | 26 | 17 | 21 | 14 |
| 505: | 15 | 4 | 19 | 17 | 23 | 25 | 59 | 63 |
| 513: | 21 | 19 | 9 | 20 | 11 | 18 | 12 | 20 |
| 521: | 16 | 8 | 14 | 15 | 16 | 10 | 13 | 8 |
| 529: | 10 | 19 | 9 | 5 | 14 | 18 | 9 | 8 |
| 537: | 8 | 14 | 13 | 14 | 9 | 18 | 10 | 13 |
| 545: | 16 | 19 | 12 | 16 | 14 | 10 | 10 | 13 |
| 553: | 13 | 15 | 14 | 10 | 19 | 12 | 10 | 13 |
| 561: | 10 | 13 | 15 | 14 | 8 | 20 | 9 | 13 |
| 569: | 3 | 11 | 8 | 9 | 12 | 12 | 16 | 16 |
| 577: | 10 | 11 | 14 | 12 | 19 | 36 | 81 | 95 |
| 585: | 30 | 18 | 12 | 11 | 10 | 8 | 14 | 12 |
| 593: | 12 | 8 | 18 | 17 | 9 | 8 | 12 | 16 |
| 601: | 14 | 12 | 6 | 6 | 19 | 14 | 8 | 42 |
| 609: | 135 | 160 | 59 | 18 | 10 | 14 | 11 | 13 |
| 617: | 10 | 15 | 10 | 12 | 6 | 8 | 14 | 9 |
| 625: | 10 | 11 | 7 | 12 | 11 | 9 | 7 | 12 |
| 633: | 11 | 12 | 9 | 11 | 13 | 10 | 9 | 10 |
| 641: | 12 | 13 | 10 | 12 | 12 | 9 | 6 | 12 |
| 649: | 9 | 11 | 9 | 9 | 9 | 13 | 8 | 12 |
| 657: | 14 | 7 | 6 | 9 | 15 | 30 | 14 | 9 |
| 665: | 9 | 11 | 5 | 5 | 12 | 15 | 5 | 13 |
| 673: | 6 | 13 | 17 | 15 | 11 | 12 | 8 | 5 |
| 681: | 10 | 14 | 12 | 8 | 13 | 7 | 13 | 9 |
| 689: | 12 | 10 | 9 | 14 | 11 | 10 | 12 | 15 |
| 697: | 12 | 11 | 8 | 11 | 14 | 11 | 6 | 9 |
| 705: | 19 | 10 | 6 | 14 | 21 | 10 | 7 | 8 |
| 713: | 9 | 4 | 12 | 9 | 9 | 9 | 8 | 5 |
| 721: | 10 | 7 | 9 | 10 | 9 | 15 | 26 | 28 |
| 729: | 10 | 10 | 13 | 8 | 11 | 9 | 5 | 8 |
| 737: | 5 | 10 | 6 | 9 | 9 | 10 | 20 | 8 |
| 745: | 10 | 5 | 9 | 4 | 12 | 9 | 8 | 13 |
| 753: | 9 | 4 | 8 | 12 | 8 | 11 | 12 | 10 |
| 761: | 10 | 5 | 11 | 16 | 9 | 6 | 14 | 21 |
| 769: | 23 | 15 | 8 | 11 | 7 | 7 | 7 | 8 |
| 777: | 9 | 7 | 7 | 6 | 13 | 10 | 8 | 12 |
| 785: | 17 | 13 | 9 | 9 | 8 | 13 | 8 | 6 |
| 793: | 10 | 16 | 19 | 10 | 7 | 9 | 2 | 11 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 6 | 8 | 11 | 12 | 14 | 7 | 12 | 7 |

Sample Title: HTC-A03-S002-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 9 | 9 | 6 | 4 | 5 | 10 | 5 | 5 |
| 817: | 7 | 4 | 5 | 12 | 7 | 5 | 8 | 10 |
| 825: | 13 | 6 | 6 | 7 | 9 | 9 | 9 | 6 |
| 833: | 8 | 12 | 11 | 13 | 6 | 7 | 7 | 12 |
| 841: | 16 | 9 | 9 | 10 | 8 | 9 | 8 | 5 |
| 849: | 7 | 5 | 4 | 4 | 7 | 6 | 3 | 10 |
| 857: | 6 | 9 | 15 | 16 | 10 | 9 | 7 | 5 |
| 865: | 4 | 9 | 6 | 4 | 5 | 7 | 8 | 17 |
| 873: | 7 | 8 | 10 | 5 | 7 | 7 | 10 | 5 |
| 881: | 5 | 6 | 6 | 12 | 11 | 8 | 5 | 6 |
| 889: | 10 | 9 | 10 | 3 | 7 | 7 | 7 | 12 |
| 897: | 8 | 7 | 11 | 10 | 12 | 6 | 6 | 10 |
| 905: | 6 | 11 | 6 | 5 | 10 | 28 | 56 | 45 |
| 913: | 13 | 2 | 3 | 6 | 9 | 6 | 10 | 5 |
| 921: | 11 | 6 | 9 | 4 | 4 | 7 | 4 | 5 |
| 929: | 7 | 7 | 8 | 3 | 11 | 19 | 12 | 17 |
| 937: | 4 | 4 | 10 | 3 | 6 | 6 | 6 | 8 |
| 945: | 9 | 9 | 4 | 5 | 9 | 6 | 7 | 2 |
| 953: | 6 | 11 | 5 | 6 | 10 | 14 | 6 | 8 |
| 961: | 4 | 11 | 7 | 15 | 11 | 4 | 9 | 21 |
| 969: | 29 | 18 | 9 | 7 | 7 | 6 | 7 | 8 |
| 977: | 5 | 8 | 7 | 4 | 5 | 5 | 8 | 1 |
| 985: | 9 | 16 | 9 | 2 | 4 | 7 | 8 | 7 |
| 993: | 5 | 7 | 12 | 7 | 6 | 7 | 8 | 12 |
| 1001: | 11 | 8 | 4 | 3 | 6 | 6 | 6 | 11 |
| 1009: | 6 | 7 | 3 | 4 | 5 | 8 | 12 | 5 |
| 1017: | 7 | 4 | 6 | 6 | 8 | 1 | 5 | 3 |
| 1025: | 5 | 9 | 2 | 6 | 2 | 3 | 8 | 5 |
| 1033: | 5 | 6 | 6 | 5 | 9 | 2 | 4 | 8 |
| 1041: | 7 | 4 | 6 | 6 | 5 | 8 | 5 | 2 |
| 1049: | 8 | 6 | 6 | 8 | 5 | 7 | 5 | 8 |
| 1057: | 2 | 6 | 2 | 10 | 7 | 6 | 9 | 7 |
| 1065: | 5 | 5 | 4 | 9 | 9 | 6 | 4 | 3 |
| 1073: | 8 | 5 | 11 | 6 | 5 | 13 | 4 | 7 |
| 1081: | 2 | 3 | 8 | 5 | 5 | 7 | 5 | 12 |
| 1089: | 7 | 14 | 0 | 6 | 5 | 7 | 6 | 7 |
| 1097: | 9 | 4 | 7 | 6 | 4 | 8 | 9 | 7 |
| 1105: | 3 | 7 | 7 | 10 | 9 | 12 | 9 | 8 |
| 1113: | 4 | 9 | 10 | 4 | 7 | 9 | 19 | 36 |
| 1121: | 43 | 17 | 6 | 4 | 7 | 5 | 5 | 10 |
| 1129: | 11 | 9 | 4 | 5 | 6 | 6 | 7 | 15 |
| 1137: | 7 | 8 | 5 | 12 | 10 | 4 | 4 | 10 |
| 1145: | 7 | 10 | 9 | 7 | 8 | 8 | 2 | 8 |
| 1153: | 13 | 8 | 7 | 10 | 7 | 8 | 5 | 6 |
| 1161: | 7 | 7 | 9 | 7 | 3 | 11 | 4 | 9 |
| 1169: | 10 | 3 | 6 | 12 | 10 | 2 | 7 | 5 |
| 1177: | 8 | 7 | 5 | 5 | 8 | 10 | 6 | 8 |
| 1185: | 5 | 5 | 5 | 7 | 8 | 7 | 8 | 7 |
| 1193: | 13 | 10 | 14 | 8 | 2 | 5 | 9 | 6 |
| 1201: | 8 | 9 | 7 | 9 | 10 | 8 | 6 | 5 |
| 1209: | 13 | 5 | 10 | 8 | 11 | 11 | 8 | 10 |
| 1217: | 8 | 8 | 6 | 6 | 11 | 3 | 6 | 5 |
| 1225: | 10 | 8 | 3 | 8 | 7 | 10 | 4 | 6 |

| 1233: | 11 | 8 | 2 | 7 | 16 | 17 | 18 | 12 |
|---|---|---|---|---|---|---|---|---|

Sample Title: HTC-A03-S002-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 5 | 7 | 7 | 9 | 8 | 12 | 3 | 0 |
| 1249: | 4 | 4 | 5 | 5 | 8 | 6 | 8 | 6 |
| 1257: | 2 | 4 | 4 | 3 | 5 | 6 | 9 | 5 |
| 1265: | 8 | 3 | 4 | 9 | 8 | 3 | 4 | 8 |
| 1273: | 9 | 6 | 7 | 7 | 5 | 7 | 6 | 6 |
| 1281: | 7 | 9 | 9 | 6 | 3 | 8 | 4 | 6 |
| 1289: | 6 | 6 | 4 | 6 | 5 | 2 | 7 | 3 |
| 1297: | 5 | 4 | 4 | 6 | 8 | 6 | 5 | 10 |
| 1305: | 6 | 3 | 6 | 4 | 8 | 1 | 1 | 8 |
| 1313: | 3 | 6 | 1 | 5 | 5 | 3 | 9 | 4 |
| 1321: | 2 | 5 | 8 | 4 | 4 | 3 | 3 | 4 |
| 1329: | 5 | 6 | 3 | 10 | 6 | 5 | 3 | 8 |
| 1337: | 6 | 4 | 4 | 2 | 5 | 3 | 3 | 4 |
| 1345: | 2 | 2 | 1 | 4 | 2 | 3 | 3 | 0 |
| 1353: | 7 | 2 | 2 | 5 | 4 | 3 | 3 | 3 |
| 1361: | 2 | 1 | 3 | 4 | 1 | 4 | 2 | 7 |
| 1369: | 3 | 1 | 6 | 2 | 4 | 3 | 2 | 6 |
| 1377: | 9 | 9 | 10 | 4 | 2 | 2 | 1 | 5 |
| 1385: | 7 | 7 | 1 | 5 | 3 | 0 | 1 | 4 |
| 1393: | 3 | 2 | 5 | 4 | 3 | 3 | 2 | 3 |
| 1401: | 6 | 3 | 6 | 3 | 3 | 6 | 8 | 8 |
| 1409: | 6 | 0 | 7 | 1 | 5 | 3 | 3 | 5 |
| 1417: | 5 | 2 | 1 | 3 | 2 | 5 | 1 | 2 |
| 1425: | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 6 |
| 1433: | 0 | 4 | 4 | 0 | 3 | 1 | 6 | 3 |
| 1441: | 4 | 3 | 4 | 3 | 6 | 2 | 0 | 1 |
| 1449: | 3 | 1 | 2 | 4 | 1 | 3 | 3 | 2 |
| 1457: | 2 | 18 | 65 | 186 | 179 | 111 | 15 | 4 |
| 1465: | 2 | 1 | 0 | 1 | 2 | 4 | 1 | 3 |
| 1473: | 0 | 2 | 2 | 1 | 1 | 2 | 4 | 1 |
| 1481: | 3 | 1 | 1 | 2 | 2 | 5 | 2 | 0 |
| 1489: | 1 | 2 | 2 | 1 | 2 | 5 | 2 | 7 |
| 1497: | 1 | 1 | 3 | 1 | 2 | 2 | 5 | 2 |
| 1505: | 0 | 2 | 4 | 6 | 2 | 5 | 2 | 1 |
| 1513: | 2 | 0 | 2 | 1 | 4 | 5 | 1 | 0 |
| 1521: | 0 | 2 | 2 | 1 | 2 | 3 | 2 | 2 |
| 1529: | 3 | 1 | 0 | 2 | 0 | 3 | 1 | 4 |
| 1537: | 2 | 1 | 2 | 2 | 2 | 3 | 1 | 6 |
| 1545: | 2 | 0 | 1 | 2 | 2 | 1 | 4 | 3 |
| 1553: | 2 | 1 | 0 | 0 | 3 | 2 | 0 | 2 |
| 1561: | 0 | 2 | 4 | 3 | 3 | 1 | 0 | 1 |
| 1569: | 0 | 2 | 4 | 0 | 1 | 2 | 1 | 2 |
| 1577: | 2 | 1 | 2 | 4 | 0 | 3 | 2 | 1 |
| 1585: | 1 | 1 | 6 | 4 | 4 | 3 | 2 | 6 |
| 1593: | 6 | 4 | 1 | 2 | 2 | 1 | 1 | 3 |
| 1601: | 1 | 2 | 0 | 4 | 1 | 2 | 1 | 2 |
| 1609: | 0 | 0 | 0 | 2 | 1 | 0 | 2 | 0 |
| 1617: | 2 | 3 | 1 | 1 | 3 | 3 | 1 | 2 |
| 1625: | 1 | 2 | 0 | 1 | 0 | 2 | 4 | 1 |
| 1633: | 0 | 1 | 2 | 1 | 0 | 3 | 2 | 0 |
| 1641: | 3 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 1649: | 0 | 0 | 0 | 3 | 2 | 0 | 1 | 1 |
| 1657: | 2 | 1 | 2 | 1 | 3 | 2 | 0 | 3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 1 | 0 | 2 | 2 | 1 | 0 | 1 | 0 |

Sample Title: HTC-A03-S002-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 4 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 1681: | 0 | 0 | 1 | 2 | 2 | 0 | 1 | 0 |
| 1689: | 0 | 0 | 2 | 2 | 4 | 0 | 1 | 0 |
| 1697: | 0 | 0 | 3 | 0 | 1 | 1 | 3 | 0 |
| 1705: | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 1713: | 1 | 1 | 1 | 0 | 2 | 4 | 1 | 1 |
| 1721: | 0 | 1 | 0 | 3 | 2 | 0 | 0 | 5 |
| 1729: | 8 | 3 | 1 | 0 | 1 | 0 | 3 | 2 |
| 1737: | 0 | 2 | 2 | 0 | 1 | 2 | 0 | 2 |
| 1745: | 3 | 2 | 1 | 4 | 2 | 0 | 0 | 1 |
| 1753: | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 |
| 1761: | 2 | 4 | 8 | 22 | 20 | 6 | 0 | 1 |
| 1769: | 3 | 1 | 1 | 0 | 3 | 2 | 1 | 0 |
| 1777: | 1 | 2 | 1 | 0 | 2 | 1 | 0 | 0 |
| 1785: | 0 | 2 | 1 | 1 | 1 | 0 | 0 | 0 |
| 1793: | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 0 |
| 1801: | 1 | 1 | 2 | 2 | 1 | 0 | 4 | 0 |
| 1809: | 1 | 4 | 0 | 0 | 1 | 1 | 1 | 0 |
| 1817: | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 1 |
| 1825: | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 1833: | 1 | 1 | 0 | 0 | 1 | 1 | 3 | 1 |
| 1841: | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 |
| 1849: | 2 | 2 | 2 | 0 | 0 | 1 | 0 | 0 |
| 1857: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 2 |
| 1865: | 2 | 2 | 0 | 0 | 3 | 2 | 0 | 0 |
| 1873: | 1 | 2 | 3 | 1 | 1 | 0 | 0 | 1 |
| 1881: | 3 | 1 | 0 | 1 | 2 | 0 | 4 | 1 |
| 1889: | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 2 |
| 1897: | 0 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| 1905: | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 2 |
| 1913: | 2 | 1 | 0 | 1 | 2 | 2 | 0 | 0 |
| 1921: | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 0 |
| 1929: | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| 1937: | 2 | 0 | 1 | 1 | 2 | 1 | 0 | 0 |
| 1945: | 1 | 0 | 3 | 0 | 1 | 2 | 0 | 0 |
| 1953: | 1 | 0 | 2 | 0 | 2 | 2 | 0 | 2 |
| 1961: | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1969: | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 4 |
| 1977: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1985: | 1 | 1 | 2 | 2 | 1 | 0 | 1 | 0 |
| 1993: | 2 | 2 | 0 | 4 | 0 | 2 | 2 | 3 |
| 2001: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2009: | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 1 |
| 2017: | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2025: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2033: | 2 | 2 | 0 | 1 | 1 | 1 | 2 | 1 |
| 2041: | 0 | 2 | 0 | 1 | 2 | 0 | 1 | 1 |
| 2049: | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 1 |
| 2057: | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 0 |
| 2065: | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 2 |
| 2073: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2081: | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 1 |
| 2089: | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 1 | 1 | 1 | 4 | 2 | 2 | 5 | 0 |

Sample Title: HTC-A03-S002-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 2 | 1 | 5 | 1 | 2 | 1 | 1 | 0 |
| 2113: | 1 | 1 | 0 | 2 | 2 | 2 | 3 | 0 |
| 2121: | 1 | 2 | 0 | 2 | 1 | 0 | 1 | 1 |
| 2129: | 1 | 0 | 1 | 0 | 2 | 4 | 0 | 0 |
| 2137: | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| 2145: | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 0 |
| 2153: | 2 | 0 | 0 | 3 | 0 | 1 | 0 | 1 |
| 2161: | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 2 |
| 2169: | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 2 |
| 2177: | 2 | 2 | 0 | 0 | 2 | 0 | 0 | 2 |
| 2185: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2193: | 1 | 0 | 0 | 3 | 0 | 0 | 1 | 0 |
| 2201: | 1 | 1 | 1 | 7 | 2 | 2 | 3 | 0 |
| 2209: | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 |
| 2217: | 3 | 0 | 0 | 1 | 1 | 2 | 1 | 1 |
| 2225: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 2233: | 1 | 2 | 1 | 0 | 1 | 1 | 1 | 0 |
| 2241: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2249: | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 1 |
| 2257: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2265: | 0 | 1 | 0 | 2 | 1 | 1 | 0 | 0 |
| 2273: | 2 | 2 | 2 | 1 | 0 | 1 | 0 | 1 |
| 2281: | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| 2289: | 1 | 0 | 2 | 2 | 2 | 1 | 1 | 2 |
| 2297: | 0 | 1 | 2 | 0 | 1 | 3 | 3 | 4 |
| 2305: | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 |
| 2313: | 1 | 0 | 3 | 1 | 0 | 1 | 0 | 1 |
| 2321: | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 2329: | 2 | 0 | 0 | 6 | 1 | 1 | 2 | 1 |
| 2337: | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 1 |
| 2345: | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 2 |
| 2353: | 1 | 1 | 0 | 2 | 1 | 2 | 1 | 0 |
| 2361: | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 2 |
| 2369: | 0 | 1 | 2 | 0 | 1 | 1 | 2 | 1 |
| 2377: | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2385: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2393: | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 0 |
| 2401: | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 1 |
| 2409: | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2417: | 1 | 3 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2425: | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 1 |
| 2433: | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 2 |
| 2441: | 0 | 2 | 0 | 1 | 1 | 0 | 1 | 3 |
| 2449: | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2457: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2465: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2473: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2481: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2489: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| 2497: | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 2 |
| 2505: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2521: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |

Sample Title: HTC-A03-S002-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2545: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2553: | 0 | 0 | 0 | 0 | 3 | 2 | 1 | 0 |
| 2561: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2569: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| 2577: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2585: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2593: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2601: | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 0 |
| 2609: | 1 | 0 | 2 | 8 | 14 | 20 | 15 | 9 |
| 2617: | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2625: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2633: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2641: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2649: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2665: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2673: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2689: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2697: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2713: | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 2721: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2729: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2737: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2745: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2753: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2761: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2769: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2793: | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 2801: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2809: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2825: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2833: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2841: | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2865: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2873: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2881: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2897: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2921: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 2929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2945: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

Sample Title: HTC-A03-S002-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2993: | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3001: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3009: | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 0 |
| 3017: | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3081: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3153: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3161: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3177: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3185: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 3193: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3233: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3249: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3313: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3353: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-1218-01

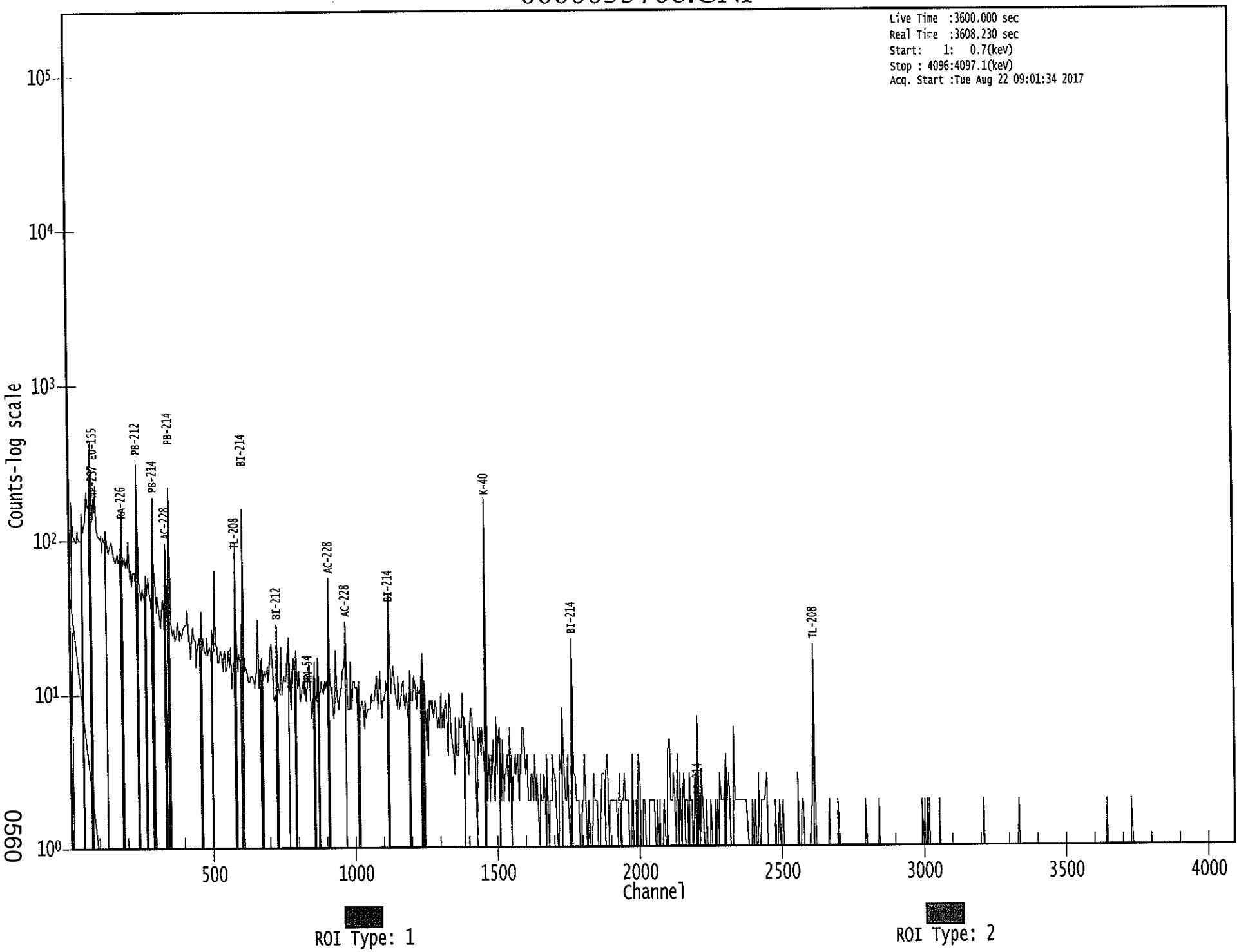
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3409: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3457: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3633: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 3729: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3737: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3745: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3769: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3793: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 |

# 0000055706.CNF




0660

Apex-Gamma

8/22

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-07 |
| Sample Description | : HTC-A03-S002-1824-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.439E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:42:58AM |
| Acquisition Started | : 8/22/2017 10:04:14AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE2 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.1 seconds |
| Dead Time | : 0.03 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 29 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 8/19/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55709 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 11:04:43AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 76.28 | 76.60 | 0.0000 | 0.00 |
| 2 | 88.07 | 88.37 | 0.0000 | 0.00 |
| 3 | 93.21 | 93.51 | 0.0000 | 0.00 |
| 4 | 128.43 | 128.68 | 0.0000 | 0.00 |
| 5 | 185.96 | 186.15 | 0.0000 | 0.00 |
| 6 | 204.07 | 204.25 | 0.0000 | 0.00 |
| 7 | 209.80 | 209.97 | 0.0000 | 0.00 |
| 8 | 238.64 | 238.78 | 0.0000 | 0.00 |
| 9 | 241.63 | 241.76 | 0.0000 | 0.00 |
| 10 | 269.70 | 269.80 | 0.0000 | 0.00 |
| 11 | 277.88 | 277.97 | 0.0000 | 0.00 |
| 12 | 295.18 | 295.26 | 0.0000 | 0.00 |
| 13 | 299.99 | 300.06 | 0.0000 | 0.00 |
| 14 | 307.52 | 307.59 | 0.0000 | 0.00 |
| 15 | 338.46 | 338.50 | 0.0000 | 0.00 |
| 16 | 351.90 | 351.92 | 0.0000 | 0.00 |
| 17 | 408.86 | 408.82 | 0.0000 | 0.00 |
| 18 | 463.19 | 463.09 | 0.0000 | 0.00 |
| 19 | 510.76 | 510.61 | 0.0000 | 0.00 |
| 20 | 533.80 | 533.64 | 0.0000 | 0.00 |
| 21 | 582.97 | 582.75 | 0.0000 | 0.00 |
| 22 | 604.41 | 604.17 | 0.0000 | 0.00 |
| 23 | 609.41 | 609.17 | 0.0000 | 0.00 |
| 24 | 661.43 | 661.13 | 0.0000 | 0.00 |
| 25 | 727.62 | 727.26 | 0.0000 | 0.00 |
| 26 | 795.24 | 794.81 | 0.0000 | 0.00 |
| 27 | 860.72 | 860.23 | 0.0000 | 0.00 |
| 28 | 911.53 | 910.99 | 0.0000 | 0.00 |
| 29 | 965.18 | 964.59 | 0.0000 | 0.00 |
| 30 | 969.35 | 968.76 | 0.0000 | 0.00 |
| 31 | 1120.57 | 1119.84 | 0.0000 | 0.00 |
| 32 | 1238.87 | 1238.03 | 0.0000 | 0.00 |
| 33 | 1378.16 | 1377.20 | 0.0000 | 0.00 |
| 34 | 1461.17 | 1460.14 | 0.0000 | 0.00 |
| 35 | 1479.37 | 1478.33 | 0.0000 | 0.00 |
| 36 | 1546.45 | 1545.35 | 0.0000 | 0.00 |
| 37 | 1590.31 | 1589.18 | 0.0000 | 0.00 |
| 38 | 1619.87 | 1618.71 | 0.0000 | 0.00 |
| 39 | 1685.25 | 1684.04 | 0.0000 | 0.00 |
| 40 | 1692.21 | 1691.00 | 0.0000 | 0.00 |
| 41 | 1730.25 | 1729.00 | 0.0000 | 0.00 |
| 42 | 1765.17 | 1763.90 | 0.0000 | 0.00 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1936.55 | 1935.15 | 0.0000 | 0.00 |
| 44 | 1947.13 | 1945.72 | 0.0000 | 0.00 |
| 45 | 2102.29 | 2100.77 | 0.0000 | 0.00 |
| 46 | 2205.11 | 2203.52 | 0.0000 | 0.00 |
| 47 | 2614.94 | 2613.07 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 11:04:43AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 76.28 | 72 - | 82 | 76.60 | 9.73E+02 | 145.45 | 2.26E+03 | 3.87 |
| | 2 | 88.07 | 86 - | 91 | 88.37 | 1.78E+02 | 86.62 | 1.35E+03 | 3.59 |
| | 3 | 93.21 | 92 - | 96 | 93.51 | 1.84E+02 | 67.99 | 8.34E+02 | 1.64 |
| | 4 | 128.43 | 126 - | 131 | 128.68 | 8.41E+01 | 64.56 | 7.64E+02 | 1.31 |
| | 5 | 185.96 | 183 - | 189 | 186.15 | 1.51E+02 | 68.98 | 7.48E+02 | 1.42 |
| | 6 | 204.07 | 202 - | 206 | 204.25 | 4.07E+01 | 45.66 | 4.21E+02 | 1.84 |
| | 7 | 209.80 | 207 - | 213 | 209.97 | 7.85E+01 | 59.17 | 5.83E+02 | 1.91 |
| M | 8 | 238.64 | 235 - | 246 | 238.78 | 7.44E+02 | 69.71 | 4.55E+02 | 1.54 |
| m | 9 | 241.63 | 235 - | 246 | 241.76 | 1.52E+02 | 81.76 | 5.73E+02 | 2.35 |
| | 10 | 269.70 | 266 - | 273 | 269.80 | 6.79E+01 | 55.32 | 4.66E+02 | 1.28 |
| | 11 | 277.88 | 274 - | 281 | 277.97 | 5.14E+01 | 55.53 | 4.79E+02 | 1.43 |
| M | 12 | 295.18 | 291 - | 303 | 295.26 | 2.63E+02 | 46.79 | 2.60E+02 | 1.56 |
| m | 13 | 299.99 | 291 - | 303 | 300.06 | 6.16E+01 | 36.41 | 2.27E+02 | 1.57 |
| | 14 | 307.52 | 304 - | 311 | 307.59 | 4.03E+01 | 45.83 | 3.21E+02 | 3.22 |
| | 15 | 338.46 | 335 - | 340 | 338.50 | 1.30E+02 | 42.74 | 2.61E+02 | 1.84 |
| | 16 | 351.90 | 348 - | 355 | 351.92 | 3.93E+02 | 63.15 | 4.01E+02 | 1.39 |
| | 17 | 408.86 | 405 - | 413 | 408.82 | 6.84E+01 | 40.89 | 2.13E+02 | 4.00 |
| | 18 | 463.19 | 459 - | 467 | 463.09 | 5.52E+01 | 43.06 | 2.50E+02 | 1.96 |
| | 19 | 510.76 | 505 - | 514 | 510.61 | 1.96E+02 | 46.34 | 1.95E+02 | 1.94 |
| | 20 | 533.80 | 530 - | 536 | 533.64 | 2.71E+01 | 31.23 | 1.58E+02 | 2.61 |
| | 21 | 582.97 | 578 - | 587 | 582.75 | 2.60E+02 | 52.51 | 2.47E+02 | 1.44 |
| M | 22 | 604.41 | 603 - | 620 | 604.17 | 1.84E+01 | 11.79 | 3.78E+01 | 1.84 |
| m | 23 | 609.41 | 603 - | 620 | 609.17 | 3.34E+02 | 43.53 | 1.06E+02 | 1.85 |
| | 24 | 661.43 | 658 - | 663 | 661.13 | 4.21E+01 | 25.79 | 9.98E+01 | 1.72 |
| | 25 | 727.62 | 723 - | 731 | 727.26 | 5.79E+01 | 33.34 | 1.36E+02 | 2.13 |
| | 26 | 795.24 | 790 - | 798 | 794.81 | 4.02E+01 | 31.22 | 1.24E+02 | 1.55 |
| | 27 | 860.72 | 854 - | 866 | 860.23 | 5.47E+01 | 37.14 | 1.37E+02 | 2.43 |
| | 28 | 911.53 | 905 - | 917 | 910.99 | 1.74E+02 | 40.38 | 1.09E+02 | 2.45 |
| M | 29 | 965.18 | 958 - | 972 | 964.59 | 3.51E+01 | 22.67 | 6.37E+01 | 1.98 |
| m | 30 | 969.35 | 958 - | 972 | 968.76 | 9.03E+01 | 30.22 | 7.93E+01 | 2.44 |
| | 31 | 1120.57 | 1116 - | 1125 | 1119.84 | 5.20E+01 | 35.87 | 1.52E+02 | 2.41 |
| | 32 | 1238.87 | 1234 - | 1242 | 1238.03 | 4.56E+01 | 27.22 | 8.68E+01 | 5.66 |
| | 33 | 1378.16 | 1372 - | 1381 | 1377.20 | 1.83E+01 | 16.79 | 2.93E+01 | 3.16 |
| | 34 | 1461.17 | 1453 - | 1466 | 1460.14 | 7.60E+02 | 58.46 | 4.22E+01 | 2.56 |
| | 35 | 1479.37 | 1475 - | 1481 | 1478.33 | 8.00E+00 | 10.44 | 1.40E+01 | 1.66 |
| | 36 | 1546.45 | 1542 - | 1548 | 1545.35 | 9.50E+00 | 8.75 | 7.00E+00 | 2.78 |
| | 37 | 1590.31 | 1585 - | 1594 | 1589.18 | 1.50E+01 | 16.43 | 3.00E+01 | 1.30 |
| | 38 | 1619.87 | 1615 - | 1623 | 1618.71 | 1.13E+01 | 13.90 | 2.35E+01 | 3.34 |
| | 39 | 1685.25 | 1682 - | 1686 | 1684.04 | 5.13E+00 | 6.67 | 5.75E+00 | 2.59 |
| | 40 | 1692.21 | 1689 - | 1693 | 1691.00 | 8.00E+00 | 5.66 | 0.00E+00 | 1.20 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|
| 41 | 1730.25 | 1725 - | 1733 | 1729.00 | 2.40E+01 | 11.15 | 3.96E+00 | 1.32 |
| 42 | 1765.17 | 1758 - | 1769 | 1763.90 | 5.60E+01 | 22.54 | 3.40E+01 | 2.12 |
| 43 | 1936.55 | 1932 - | 1937 | 1935.15 | 7.50E+00 | 6.71 | 3.00E+00 | 1.38 |
| 44 | 1947.13 | 1939 - | 1950 | 1945.72 | 1.10E+01 | 11.83 | 1.20E+01 | 8.43 |
| 45 | 2102.29 | 2096 - | 2105 | 2100.77 | 1.54E+01 | 9.85 | 5.11E+00 | 5.93 |
| 46 | 2205.11 | 2200 - | 2206 | 2203.52 | 1.25E+01 | 9.41 | 7.00E+00 | 2.75 |
| 47 | 2614.94 | 2607 - | 2617 | 2613.07 | 8.07E+01 | 22.11 | 2.26E+01 | 2.40 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 11:04:43AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 76.28 | 72 - | 82 | 9.73E+02 | 145.45 | 2.26E+03 | 1.08E+02 |
| | 2 | 88.07 | 86 - | 91 | 1.78E+02 | 86.62 | 1.35E+03 | 6.77E+01 |
| | 3 | 93.21 | 92 - | 96 | 1.84E+02 | 67.99 | 8.34E+02 | 5.12E+01 |
| | 4 | 128.43 | 126 - | 131 | 8.41E+01 | 64.56 | 7.64E+02 | 5.09E+01 |
| | 5 | 185.96 | 183 - | 189 | 1.51E+02 | 68.98 | 7.48E+02 | 5.30E+01 |
| | 6 | 204.07 | 202 - | 206 | 4.07E+01 | 45.66 | 4.21E+02 | 3.60E+01 |
| | 7 | 209.80 | 207 - | 213 | 7.85E+01 | 59.17 | 5.83E+02 | 4.64E+01 |
| M | 8 | 238.64 | 235 - | 246 | 7.44E+02 | 69.71 | 4.55E+02 | 3.51E+01 |
| m | 9 | 241.63 | 235 - | 246 | 1.52E+02 | 81.76 | 5.73E+02 | 3.94E+01 |
| | 10 | 269.70 | 266 - | 273 | 6.79E+01 | 55.32 | 4.66E+02 | 4.34E+01 |
| | 11 | 277.88 | 274 - | 281 | 5.14E+01 | 55.53 | 4.79E+02 | 4.41E+01 |
| M | 12 | 295.18 | 291 - | 303 | 2.63E+02 | 46.79 | 2.60E+02 | 2.65E+01 |
| m | 13 | 299.99 | 291 - | 303 | 6.16E+01 | 36.41 | 2.27E+02 | 2.47E+01 |
| | 14 | 307.52 | 304 - | 311 | 4.03E+01 | 45.83 | 3.21E+02 | 3.62E+01 |
| | 15 | 338.46 | 335 - | 340 | 1.30E+02 | 42.74 | 2.61E+02 | 2.97E+01 |
| | 16 | 351.90 | 348 - | 355 | 3.93E+02 | 63.15 | 4.01E+02 | 4.04E+01 |
| | 17 | 408.86 | 405 - | 413 | 6.84E+01 | 40.89 | 2.13E+02 | 3.07E+01 |
| | 18 | 463.19 | 459 - | 467 | 5.52E+01 | 43.06 | 2.50E+02 | 3.32E+01 |
| | 19 | 510.76 | 505 - | 514 | 1.96E+02 | 46.34 | 1.95E+02 | 3.04E+01 |
| | 20 | 533.80 | 530 - | 536 | 2.71E+01 | 31.23 | 1.58E+02 | 2.42E+01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 21 | 582.97 | 578 - | 587 | 2.60E+02 | 52.51 | 2.47E+02 | 3.41E+01 |
| M | 22 | 604.41 | 603 - | 620 | 1.84E+01 | 11.79 | 3.78E+01 | 1.01E+01 |
| m | 23 | 609.41 | 603 - | 620 | 3.34E+02 | 43.53 | 1.06E+02 | 1.69E+01 |
| | 24 | 661.43 | 658 - | 663 | 4.21E+01 | 25.79 | 9.98E+01 | 1.83E+01 |
| | 25 | 727.62 | 723 - | 731 | 5.79E+01 | 33.34 | 1.36E+02 | 2.44E+01 |
| | 26 | 795.24 | 790 - | 798 | 4.02E+01 | 31.22 | 1.24E+02 | 2.35E+01 |
| | 27 | 860.72 | 854 - | 866 | 5.47E+01 | 37.14 | 1.37E+02 | 2.80E+01 |
| | 28 | 911.53 | 905 - | 917 | 1.74E+02 | 40.38 | 1.09E+02 | 2.51E+01 |
| M | 29 | 965.18 | 958 - | 972 | 3.51E+01 | 22.67 | 6.37E+01 | 1.31E+01 |
| m | 30 | 969.35 | 958 - | 972 | 9.03E+01 | 30.22 | 7.93E+01 | 1.46E+01 |
| | 31 | 1120.57 | 1116 - | 1125 | 5.20E+01 | 35.87 | 1.52E+02 | 2.70E+01 |
| | 32 | 1238.87 | 1234 - | 1242 | 4.56E+01 | 27.22 | 8.68E+01 | 1.94E+01 |
| | 33 | 1378.16 | 1372 - | 1381 | 1.83E+01 | 16.79 | 2.93E+01 | 1.19E+01 |
| | 34 | 1461.17 | 1453 - | 1466 | 7.60E+02 | 58.46 | 4.22E+01 | 1.60E+01 |
| | 35 | 1479.37 | 1475 - | 1481 | 8.00E+00 | 10.44 | 1.40E+01 | 7.21E+00 |
| | 36 | 1546.45 | 1542 - | 1548 | 9.50E+00 | 8.75 | 7.00E+00 | 5.10E+00 |
| | 37 | 1590.31 | 1585 - | 1594 | 1.50E+01 | 16.43 | 3.00E+01 | 1.19E+01 |
| | 38 | 1619.87 | 1615 - | 1623 | 1.13E+01 | 13.90 | 2.35E+01 | 1.00E+01 |
| | 39 | 1685.25 | 1682 - | 1686 | 5.13E+00 | 6.67 | 5.75E+00 | 4.03E+00 |
| | 40 | 1692.21 | 1689 - | 1693 | 8.00E+00 | 5.66 | 0.00E+00 | 0.00E+00 |
| | 41 | 1730.25 | 1725 - | 1733 | 2.40E+01 | 11.15 | 3.96E+00 | 4.36E+00 |
| | 42 | 1765.17 | 1758 - | 1769 | 5.60E+01 | 22.54 | 3.40E+01 | 1.39E+01 |
| | 43 | 1936.55 | 1932 - | 1937 | 7.50E+00 | 6.71 | 3.00E+00 | 3.18E+00 |
| | 44 | 1947.13 | 1939 - | 1950 | 1.10E+01 | 11.83 | 1.20E+01 | 8.05E+00 |
| | 45 | 2102.29 | 2096 - | 2105 | 1.54E+01 | 9.85 | 5.11E+00 | 4.88E+00 |
| | 46 | 2205.11 | 2200 - | 2206 | 1.25E+01 | 9.41 | 7.00E+00 | 5.10E+00 |
| | 47 | 2614.94 | 2607 - | 2617 | 8.07E+01 | 22.11 | 2.26E+01 | 1.06E+01 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 11:04:43AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 76.28 | 72 - | 82 | 76.60 | 9.73E+02 | 145.45 | 2.26E+03 | ..... |
| | 2 | 88.07 | 86 - | 91 | 88.37 | 1.78E+02 | 86.62 | 1.35E+03 | CD-109 |
| | | | | | | | | | LU-176 |
| | | | | | | | | | SN-126 |
| | 3 | 93.21 | 92 - | 96 | 93.51 | 1.84E+02 | 67.99 | 8.34E+02 | GA-67 |
| | 4 | 128.43 | 126 - | 131 | 128.68 | 8.41E+01 | 64.56 | 7.64E+02 | ..... |
| | 5 | 185.96 | 183 - | 189 | 186.15 | 1.51E+02 | 68.98 | 7.48E+02 | RA-226 |
| | 6 | 204.07 | 202 - | 206 | 204.25 | 4.07E+01 | 45.66 | 4.21E+02 | ..... |
| | 7 | 209.80 | 207 - | 213 | 209.97 | 7.85E+01 | 59.17 | 5.83E+02 | CM-243 |
| | | | | | | | | | GA-67 |
| M | 8 | 238.64 | 235 - | 246 | 238.78 | 7.44E+02 | 69.71 | 4.55E+02 | PB-212 |
| m | 9 | 241.63 | 235 - | 246 | 241.76 | 1.52E+02 | 81.76 | 5.73E+02 | RA-224 |
| | 10 | 269.70 | 266 - | 273 | 269.80 | 6.79E+01 | 55.32 | 4.66E+02 | ..... |
| | 11 | 277.88 | 274 - | 281 | 277.97 | 5.14E+01 | 55.53 | 4.79E+02 | CM-243 |
| | | | | | | | | | NP-239 |
| M | 12 | 295.18 | 291 - | 303 | 295.26 | 2.63E+02 | 46.79 | 2.60E+02 | PB-214 |
| m | 13 | 299.99 | 291 - | 303 | 300.06 | 6.16E+01 | 36.41 | 2.27E+02 | BI-210M |
| | | | | | | | | | PB-212 |
| | | | | | | | | | GA-67 |
| | 14 | 307.52 | 304 - | 311 | 307.59 | 4.03E+01 | 45.83 | 3.21E+02 | LU-176 |
| | | | | | | | | | IR-192 |
| | 15 | 338.46 | 335 - | 340 | 338.50 | 1.30E+02 | 42.74 | 2.61E+02 | AC-228 |
| | 16 | 351.90 | 348 - | 355 | 351.92 | 3.93E+02 | 63.15 | 4.01E+02 | PB-214 |
| | 17 | 408.86 | 405 - | 413 | 408.82 | 6.84E+01 | 40.89 | 2.13E+02 | ..... |
| | 18 | 463.19 | 459 - | 467 | 463.09 | 5.52E+01 | 43.06 | 2.50E+02 | SB-125 |
| | 19 | 510.76 | 505 - | 514 | 510.61 | 1.96E+02 | 46.34 | 1.95E+02 | ..... |
| | 20 | 533.80 | 530 - | 536 | 533.64 | 2.71E+01 | 31.23 | 1.58E+02 | ..... |
| | 21 | 582.97 | 578 - | 587 | 582.75 | 2.60E+02 | 52.51 | 2.47E+02 | TL-208 |
| M | 22 | 604.41 | 603 - | 620 | 604.17 | 1.84E+01 | 11.79 | 3.78E+01 | CS-134 |
| m | 23 | 609.41 | 603 - | 620 | 609.17 | 3.34E+02 | 43.53 | 1.06E+02 | BI-214 |
| | 24 | 661.43 | 658 - | 663 | 661.13 | 4.21E+01 | 25.79 | 9.98E+01 | CS-137 |
| | 25 | 727.62 | 723 - | 731 | 727.26 | 5.79E+01 | 33.34 | 1.36E+02 | BI-212 |
| | 26 | 795.24 | 790 - | 798 | 794.81 | 4.02E+01 | 31.22 | 1.24E+02 | CS-134 |
| | 27 | 860.72 | 854 - | 866 | 860.23 | 5.47E+01 | 37.14 | 1.37E+02 | TL-208 |
| | 28 | 911.53 | 905 - | 917 | 910.99 | 1.74E+02 | 40.38 | 1.09E+02 | TL-204 |
| | | | | | | | | | AC-228 |
| M | 29 | 965.18 | 958 - | 972 | 964.59 | 3.51E+01 | 22.67 | 6.37E+01 | ..... |
| m | 30 | 969.35 | 958 - | 972 | 968.76 | 9.03E+01 | 30.22 | 7.93E+01 | AC-228 |
| | 31 | 1120.57 | 1116 - | 1125 | 1119.84 | 5.20E+01 | 35.87 | 1.52E+02 | SC-46 |
| | | | | | | | | | BI-214 |
| | | | | | | | | | TA-182 |
| | 32 | 1238.87 | 1234 - | 1242 | 1238.03 | 4.56E+01 | 27.22 | 8.68E+01 | CO-56 |
| | 33 | 1378.16 | 1372 - | 1381 | 1377.20 | 1.83E+01 | 16.79 | 2.93E+01 | ..... |
| | 34 | 1461.17 | 1453 - | 1466 | 1460.14 | 7.60E+02 | 58.46 | 4.22E+01 | K-40 |
| | 35 | 1479.37 | 1475 - | 1481 | 1478.33 | 8.00E+00 | 10.44 | 1.40E+01 | ..... |
| | 36 | 1546.45 | 1542 - | 1548 | 1545.35 | 9.50E+00 | 8.75 | 7.00E+00 | ..... |
| | 37 | 1590.31 | 1585 - | 1594 | 1589.18 | 1.50E+01 | 16.43 | 3.00E+01 | ..... |
| | 38 | 1619.87 | 1615 - | 1623 | 1618.71 | 1.13E+01 | 13.90 | 2.35E+01 | BI-212 |
| | 39 | 1685.25 | 1682 - | 1686 | 1684.04 | 5.13E+00 | 6.67 | 5.75E+00 | ..... |
| | 40 | 1692.21 | 1689 - | 1693 | 1691.00 | 8.00E+00 | 5.66 | 0.00E+00 | ..... |
| | 41 | 1730.25 | 1725 - | 1733 | 1729.00 | 2.40E+01 | 11.15 | 3.96E+00 | ..... |
| | 42 | 1765.17 | 1758 - | 1769 | 1763.90 | 5.60E+01 | 22.54 | 3.40E+01 | BI-214 |
| | 43 | 1936.55 | 1932 - | 1937 | 1935.15 | 7.50E+00 | 6.71 | 3.00E+00 | ..... |
| | 44 | 1947.13 | 1939 - | 1950 | 1945.72 | 1.10E+01 | 11.83 | 1.20E+01 | ..... |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|
| 45 | 2102.29 | 2096 - | 2105 | 2100.77 | 1.54E+01 | 9.85 | 5.11E+00 | ..... |
| 46 | 2205.11 | 2200 - | 2206 | 2203.52 | 1.25E+01 | 9.41 | 7.00E+00 | BI-214 |
| 47 | 2614.94 | 2607 - | 2617 | 2613.07 | 8.07E+01 | 22.11 | 2.26E+01 | TL-208 |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 11:04:43AM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 76.28 | 9.73E+02 | 145.45 | 2.63E-02 | 2.12E-03 |
| | 2 | 88.07 | 1.78E+02 | 86.62 | 2.70E-02 | 2.42E-03 |
| | 3 | 93.21 | 1.84E+02 | 67.99 | 2.70E-02 | 2.33E-03 |
| | 4 | 128.43 | 8.41E+01 | 64.56 | 2.48E-02 | 1.75E-03 |
| | 5 | 185.96 | 1.51E+02 | 68.98 | 2.03E-02 | 1.53E-03 |
| | 6 | 204.07 | 4.07E+01 | 45.66 | 1.91E-02 | 1.45E-03 |
| | 7 | 209.80 | 7.85E+01 | 59.17 | 1.88E-02 | 1.43E-03 |
| M | 8 | 238.64 | 7.44E+02 | 69.71 | 1.72E-02 | 1.30E-03 |
| m | 9 | 241.63 | 1.52E+02 | 81.76 | 1.71E-02 | 1.28E-03 |
| | 10 | 269.70 | 6.79E+01 | 55.32 | 1.58E-02 | 1.16E-03 |
| | 11 | 277.88 | 5.14E+01 | 55.53 | 1.55E-02 | 1.12E-03 |
| M | 12 | 295.18 | 2.63E+02 | 46.79 | 1.48E-02 | 1.10E-03 |
| m | 13 | 299.99 | 6.16E+01 | 36.41 | 1.47E-02 | 1.09E-03 |
| | 14 | 307.52 | 4.03E+01 | 45.83 | 1.44E-02 | 1.08E-03 |
| | 15 | 338.46 | 1.30E+02 | 42.74 | 1.34E-02 | 1.04E-03 |
| | 16 | 351.90 | 3.93E+02 | 63.15 | 1.31E-02 | 1.02E-03 |
| | 17 | 408.86 | 6.84E+01 | 40.89 | 1.17E-02 | 9.54E-04 |
| | 18 | 463.19 | 5.52E+01 | 43.06 | 1.06E-02 | 9.07E-04 |
| | 19 | 510.76 | 1.96E+02 | 46.34 | 9.87E-03 | 8.65E-04 |
| | 20 | 533.80 | 2.71E+01 | 31.23 | 9.54E-03 | 8.45E-04 |
| | 21 | 582.97 | 2.60E+02 | 52.51 | 8.91E-03 | 8.02E-04 |
| M | 22 | 604.41 | 1.84E+01 | 11.79 | 8.66E-03 | 7.84E-04 |
| m | 23 | 609.41 | 3.34E+02 | 43.53 | 8.60E-03 | 7.79E-04 |
| | 24 | 661.43 | 4.21E+01 | 25.79 | 8.06E-03 | 7.34E-04 |
| | 25 | 727.62 | 5.79E+01 | 33.34 | 7.46E-03 | 6.70E-04 |
| | 26 | 795.24 | 4.02E+01 | 31.22 | 6.94E-03 | 6.05E-04 |
| | 27 | 860.72 | 5.47E+01 | 37.14 | 6.51E-03 | 5.42E-04 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 28 | 911.53 | 1.74E+02 | 40.38 | 6.21E-03 | 5.01E-04 |
| M | 29 | 965.18 | 3.51E+01 | 22.67 | 5.92E-03 | 4.83E-04 |
| m | 30 | 969.35 | 9.03E+01 | 30.22 | 5.90E-03 | 4.81E-04 |
| | 31 | 1120.57 | 5.20E+01 | 35.87 | 5.24E-03 | 4.29E-04 |
| | 32 | 1238.87 | 4.56E+01 | 27.22 | 4.84E-03 | 4.16E-04 |
| | 33 | 1378.16 | 1.83E+01 | 16.79 | 4.45E-03 | 4.12E-04 |
| | 34 | 1461.17 | 7.60E+02 | 58.46 | 4.26E-03 | 3.88E-04 |
| | 35 | 1479.37 | 8.00E+00 | 10.44 | 4.22E-03 | 3.82E-04 |
| | 36 | 1546.45 | 9.50E+00 | 8.75 | 4.09E-03 | 3.63E-04 |
| | 37 | 1590.31 | 1.50E+01 | 16.43 | 4.01E-03 | 3.50E-04 |
| | 38 | 1619.87 | 1.13E+01 | 13.90 | 3.96E-03 | 3.42E-04 |
| | 39 | 1685.25 | 5.13E+00 | 6.67 | 3.86E-03 | 3.23E-04 |
| | 40 | 1692.21 | 8.00E+00 | 5.66 | 3.85E-03 | 3.21E-04 |
| | 41 | 1730.25 | 2.40E+01 | 11.15 | 3.79E-03 | 3.10E-04 |
| | 42 | 1765.17 | 5.60E+01 | 22.54 | 3.75E-03 | 3.00E-04 |
| | 43 | 1936.55 | 7.50E+00 | 6.71 | 3.55E-03 | 2.79E-04 |
| | 44 | 1947.13 | 1.10E+01 | 11.83 | 3.54E-03 | 2.79E-04 |
| | 45 | 2102.29 | 1.54E+01 | 9.85 | 3.41E-03 | 2.79E-04 |
| | 46 | 2205.11 | 1.25E+01 | 9.41 | 3.34E-03 | 2.79E-04 |
| | 47 | 2614.94 | 8.07E+01 | 22.11 | 3.20E-03 | 2.79E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 11:04:43AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055574.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 76.28 | 9.73E+02 | 145.45 | | | 9.73E+02 | 1.45E+02 |
| | 2 | 88.07 | 1.78E+02 | 86.62 | | | 1.78E+02 | 8.66E+01 |
| | 3 | 93.21 | 1.84E+02 | 67.99 | 4.88E+01 | 1.30E+00 | 1.35E+02 | 6.80E+01 |
| | 4 | 128.43 | 8.41E+01 | 64.56 | | | 8.41E+01 | 6.46E+01 |
| | 5 | 185.96 | 1.51E+02 | 68.98 | 3.48E+01 | 7.32E+00 | 1.16E+02 | 6.94E+01 |
| | 6 | 204.07 | 4.07E+01 | 45.66 | | | 4.07E+01 | 4.57E+01 |
| | 7 | 209.80 | 7.85E+01 | 59.17 | | | 7.85E+01 | 5.92E+01 |
| M | 8 | 238.64 | 7.44E+02 | 69.71 | 7.09E+00 | 6.85E+00 | 7.37E+02 | 7.00E+01 |
| m | 9 | 241.63 | 1.52E+02 | 81.76 | | | 1.52E+02 | 8.18E+01 |
| | 10 | 269.70 | 6.79E+01 | 55.32 | | | 6.79E+01 | 5.53E+01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 11 | 277.88 | 5.14E+01 | 55.53 | | | 5.14E+01 | 5.55E+01 |
| M | 12 | 295.18 | 2.63E+02 | 46.79 | | | 2.63E+02 | 4.68E+01 |
| m | 13 | 299.99 | 6.16E+01 | 36.41 | | | 6.16E+01 | 3.64E+01 |
| | 14 | 307.52 | 4.03E+01 | 45.83 | | | 4.03E+01 | 4.58E+01 |
| | 15 | 338.46 | 1.30E+02 | 42.74 | | | 1.30E+02 | 4.27E+01 |
| | 16 | 351.90 | 3.93E+02 | 63.15 | 1.04E+01 | 5.08E+00 | 3.82E+02 | 6.34E+01 |
| | 17 | 408.86 | 6.84E+01 | 40.89 | | | 6.84E+01 | 4.09E+01 |
| | 18 | 463.19 | 5.52E+01 | 43.06 | | | 5.52E+01 | 4.31E+01 |
| | 19 | 510.76 | 1.96E+02 | 46.34 | 7.08E+01 | 4.94E+00 | 1.25E+02 | 4.66E+01 |
| | 20 | 533.80 | 2.71E+01 | 31.23 | | | 2.71E+01 | 3.12E+01 |
| | 21 | 582.97 | 2.60E+02 | 52.51 | 5.65E+00 | 3.57E+00 | 2.54E+02 | 5.26E+01 |
| M | 22 | 604.41 | 1.84E+01 | 11.79 | | | 1.84E+01 | 1.18E+01 |
| m | 23 | 609.41 | 3.34E+02 | 43.53 | 1.07E+01 | 3.96E+00 | 3.23E+02 | 4.37E+01 |
| | 24 | 661.43 | 4.21E+01 | 25.79 | 3.04E+00 | 3.15E+00 | 3.90E+01 | 2.60E+01 |
| | 25 | 727.62 | 5.79E+01 | 33.34 | | | 5.79E+01 | 3.33E+01 |
| | 26 | 795.24 | 4.02E+01 | 31.22 | | | 4.02E+01 | 3.12E+01 |
| | 27 | 860.72 | 5.47E+01 | 37.14 | | | 5.47E+01 | 3.71E+01 |
| | 28 | 911.53 | 1.74E+02 | 40.38 | 2.63E+00 | 2.49E+00 | 1.71E+02 | 4.05E+01 |
| M | 29 | 965.18 | 3.51E+01 | 22.67 | | | 3.51E+01 | 2.27E+01 |
| m | 30 | 969.35 | 9.03E+01 | 30.22 | | | 9.03E+01 | 3.02E+01 |
| | 31 | 1120.57 | 5.20E+01 | 35.87 | 2.45E+00 | 2.38E+00 | 4.96E+01 | 3.60E+01 |
| | 32 | 1238.87 | 4.56E+01 | 27.22 | | | 4.56E+01 | 2.72E+01 |
| | 33 | 1378.16 | 1.83E+01 | 16.79 | | | 1.83E+01 | 1.68E+01 |
| | 34 | 1461.17 | 7.60E+02 | 58.46 | 5.90E+00 | 2.63E+00 | 7.54E+02 | 5.85E+01 |
| | 35 | 1479.37 | 8.00E+00 | 10.44 | | | 8.00E+00 | 1.04E+01 |
| | 36 | 1546.45 | 9.50E+00 | 8.75 | | | 9.50E+00 | 8.75E+00 |
| | 37 | 1590.31 | 1.50E+01 | 16.43 | | | 1.50E+01 | 1.64E+01 |
| | 38 | 1619.87 | 1.13E+01 | 13.90 | | | 1.13E+01 | 1.39E+01 |
| | 39 | 1685.25 | 5.13E+00 | 6.67 | | | 5.13E+00 | 6.67E+00 |
| | 40 | 1692.21 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 41 | 1730.25 | 2.40E+01 | 11.15 | | | 2.40E+01 | 1.11E+01 |
| | 42 | 1765.17 | 5.60E+01 | 22.54 | 3.33E+00 | 1.73E+00 | 5.27E+01 | 2.26E+01 |
| | 43 | 1936.55 | 7.50E+00 | 6.71 | | | 7.50E+00 | 6.71E+00 |
| | 44 | 1947.13 | 1.10E+01 | 11.83 | | | 1.10E+01 | 1.18E+01 |
| | 45 | 2102.29 | 1.54E+01 | 9.85 | | | 1.54E+01 | 9.85E+00 |
| | 46 | 2205.11 | 1.25E+01 | 9.41 | | | 1.25E+01 | 9.41E+00 |
| | 47 | 2614.94 | 8.07E+01 | 22.11 | 4.77E+00 | 1.52E+00 | 7.59E+01 | 2.22E+01 |

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

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 11:04:43AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055574.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 76.28 | 9.73E+02 | 145.45 | | | 9.73E+02 | 1.45E+02 |
| | 2 | 88.07 | 1.78E+02 | 86.62 | | | 1.78E+02 | 8.66E+01 |
| | 3 | 93.21 | 1.84E+02 | 67.99 | 4.88E+01 | 1.30E+00 | 1.35E+02 | 6.80E+01 |
| | 4 | 128.43 | 8.41E+01 | 64.56 | | | 8.41E+01 | 6.46E+01 |
| | 5 | 185.96 | 1.51E+02 | 68.98 | 3.48E+01 | 7.32E+00 | 1.16E+02 | 6.94E+01 |
| | 6 | 204.07 | 4.07E+01 | 45.66 | | | 4.07E+01 | 4.57E+01 |
| | 7 | 209.80 | 7.85E+01 | 59.17 | | | 7.85E+01 | 5.92E+01 |
| M | 8 | 238.64 | 7.44E+02 | 69.71 | 7.09E+00 | 6.85E+00 | 7.37E+02 | 7.00E+01 |
| m | 9 | 241.63 | 1.52E+02 | 81.76 | | | 1.52E+02 | 8.18E+01 |
| | 10 | 269.70 | 6.79E+01 | 55.32 | | | 6.79E+01 | 5.53E+01 |
| | 11 | 277.88 | 5.14E+01 | 55.53 | | | 5.14E+01 | 5.55E+01 |
| M | 12 | 295.18 | 2.63E+02 | 46.79 | | | 2.63E+02 | 4.68E+01 |
| m | 13 | 299.99 | 6.16E+01 | 36.41 | | | 6.16E+01 | 3.64E+01 |
| | 14 | 307.52 | 4.03E+01 | 45.83 | | | 4.03E+01 | 4.58E+01 |
| | 15 | 338.46 | 1.30E+02 | 42.74 | | | 1.30E+02 | 4.27E+01 |
| | 16 | 351.90 | 3.93E+02 | 63.15 | 1.04E+01 | 5.08E+00 | 3.82E+02 | 6.34E+01 |
| | 17 | 408.86 | 6.84E+01 | 40.89 | | | 6.84E+01 | 4.09E+01 |
| | 18 | 463.19 | 5.52E+01 | 43.06 | | | 5.52E+01 | 4.31E+01 |
| | 19 | 510.76 | 1.96E+02 | 46.34 | 7.08E+01 | 4.94E+00 | 1.25E+02 | 4.66E+01 |
| | 20 | 533.80 | 2.71E+01 | 31.23 | | | 2.71E+01 | 3.12E+01 |
| | 21 | 582.97 | 2.60E+02 | 52.51 | 5.65E+00 | 3.57E+00 | 2.54E+02 | 5.26E+01 |
| M | 22 | 604.41 | 1.84E+01 | 11.79 | | | 1.84E+01 | 1.18E+01 |
| m | 23 | 609.41 | 3.34E+02 | 43.53 | 1.07E+01 | 3.96E+00 | 3.23E+02 | 4.37E+01 |
| | 24 | 661.43 | 4.21E+01 | 25.79 | 3.04E+00 | 3.15E+00 | 3.90E+01 | 2.60E+01 |
| | 25 | 727.62 | 5.79E+01 | 33.34 | | | 5.79E+01 | 3.33E+01 |
| | 26 | 795.24 | 4.02E+01 | 31.22 | | | 4.02E+01 | 3.12E+01 |
| | 27 | 860.72 | 5.47E+01 | 37.14 | | | 5.47E+01 | 3.71E+01 |
| | 28 | 911.53 | 1.74E+02 | 40.38 | 2.63E+00 | 2.49E+00 | 1.71E+02 | 4.05E+01 |
| M | 29 | 965.18 | 3.51E+01 | 22.67 | | | 3.51E+01 | 2.27E+01 |
| m | 30 | 969.35 | 9.03E+01 | 30.22 | | | 9.03E+01 | 3.02E+01 |
| | 31 | 1120.57 | 5.20E+01 | 35.87 | 2.45E+00 | 2.38E+00 | 4.96E+01 | 3.60E+01 |
| | 32 | 1238.87 | 4.56E+01 | 27.22 | | | 4.56E+01 | 2.72E+01 |
| | 33 | 1378.16 | 1.83E+01 | 16.79 | | | 1.83E+01 | 1.68E+01 |
| | 34 | 1461.17 | 7.60E+02 | 58.46 | 5.90E+00 | 2.63E+00 | 7.54E+02 | 5.85E+01 |
| | 35 | 1479.37 | 8.00E+00 | 10.44 | | | 8.00E+00 | 1.04E+01 |
| | 36 | 1546.45 | 9.50E+00 | 8.75 | | | 9.50E+00 | 8.75E+00 |
| | 37 | 1590.31 | 1.50E+01 | 16.43 | | | 1.50E+01 | 1.64E+01 |
| | 38 | 1619.87 | 1.13E+01 | 13.90 | | | 1.13E+01 | 1.39E+01 |
| | 39 | 1685.25 | 5.13E+00 | 6.67 | | | 5.13E+00 | 6.67E+00 |
| | 40 | 1692.21 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 41 | 1730.25 | 2.40E+01 | 11.15 | | | 2.40E+01 | 1.11E+01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 42 | 1765.17 | 5.60E+01 | 22.54 | 3.33E+00 | 1.73E+00 | 5.27E+01 | 2.26E+01 |
| 43 | 1936.55 | 7.50E+00 | 6.71 | | | 7.50E+00 | 6.71E+00 |
| 44 | 1947.13 | 1.10E+01 | 11.83 | | | 1.10E+01 | 1.18E+01 |
| 45 | 2102.29 | 1.54E+01 | 9.85 | | | 1.54E+01 | 9.85E+00 |
| 46 | 2205.11 | 1.25E+01 | 9.41 | | | 1.25E+01 | 9.41E+00 |
| 47 | 2614.94 | 8.07E+01 | 22.11 | 4.77E+00 | 1.52E+00 | 7.59E+01 | 2.22E+01 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.979 | 1460.81 | * | 10.67 | 1.93E+01 | 2.34E+00 |
| CD-109 | 1.000 | 88.03 | * | 3.72 | 2.39E+00 | 1.19E+00 |
| SN-126 | 0.961 | 87.57 | * | 37.00 | 2.08E-01 | 1.03E-01 |
| CS-134 | 0.721 | 563.23 | | 8.38 | | |
| | | 569.32 | | 15.43 | | |
| | | 604.70 | * | 97.60 | 2.78E-02 | 1.80E-02 |
| | | 795.84 | * | 85.40 | 8.66E-02 | 6.77E-02 |
| | | 801.93 | | 8.73 | | |
| CS-137 | 0.992 | 661.65 | * | 85.12 | 6.68E-02 | 4.49E-02 |
| TL-208 | 0.991 | 583.14 | * | 30.22 | 1.10E+00 | 2.49E-01 |
| | | 860.37 | * | 4.48 | 2.19E+00 | 1.50E+00 |
| | | 2614.66 | * | 35.85 | 7.73E-01 | 2.35E-01 |
| BI-212 | 0.957 | 727.17 | * | 11.80 | 7.66E-01 | 4.47E-01 |
| | | 1620.62 | * | 2.75 | 1.21E+00 | 1.49E+00 |
| PB-212 | 1.000 | 238.63 | * | 44.60 | 1.12E+00 | 1.36E-01 |
| | | 300.09 | * | 3.41 | 1.44E+00 | 8.55E-01 |
| BI-214 | 0.975 | 609.31 | * | 46.30 | 9.46E-01 | 1.54E-01 |
| | | 1120.29 | * | 15.10 | 7.30E-01 | 5.33E-01 |
| | | 1764.49 | * | 15.80 | 1.04E+00 | 4.53E-01 |
| | | 2204.22 | * | 4.98 | 8.76E-01 | 6.64E-01 |
| PB-214 | 1.000 | 295.21 | * | 19.19 | 1.08E+00 | 2.07E-01 |
| | | 351.92 | * | 37.19 | 9.17E-01 | 1.68E-01 |
| RA-224 | 0.935 | 240.98 | * | 3.95 | 2.63E+00 | 1.43E+00 |
| RA-226 | 0.990 | 186.21 | * | 3.28 | 2.03E+00 | 3.91E+00 |
| AC-228 | 0.980 | 338.32 | * | 11.40 | 9.91E-01 | 3.34E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| AC-228 | 0.980 | 911.07 | * | 27.70 | 1.16E+00 | 2.90E-01 |
| | | 969.11 | * | 16.60 | 1.07E+00 | 3.70E-01 |
| CM-243 | 0.367 | 209.75 | * | 3.29 | 1.49E+00 | 1.13E+00 |
| | | 228.14 | | 10.60 | | |
| | | 277.60 | * | 14.00 | 2.78E-01 | 3.01E-01 |

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 11:04:43AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 76.28 | 2.70266E-01 | 7.47 | | |
| | 3 | 93.21 | 3.75722E-02 | 25.14 | Tol. | GA-67 |
| | 4 | 128.43 | 2.33596E-02 | 38.39 | | |
| | 6 | 204.07 | 1.13087E-02 | 56.08 | | |
| | 10 | 269.70 | 1.88621E-02 | 40.73 | | |
| | 14 | 307.52 | 1.12030E-02 | 56.81 | Tol. | LU-176<br>IR-192 |
| | 17 | 408.86 | 1.89873E-02 | 29.91 | | |
| | 18 | 463.19 | 1.53302E-02 | 39.01 | Sum | |
| | 19 | 510.76 | 3.46759E-02 | 18.66 | Sum | |
| | 20 | 533.80 | 7.52096E-03 | 57.67 | Sum | |
| M | 29 | 965.18 | 9.76066E-03 | 32.26 | | |
| | 32 | 1238.87 | 1.26717E-02 | 29.83 | | |
| | 33 | 1378.16 | 5.09259E-03 | 45.80 | Sum | |
| | 35 | 1479.37 | 2.22222E-03 | 65.25 | | |
| | 36 | 1546.45 | 2.63889E-03 | 46.03 | | |
| | 37 | 1590.31 | 4.16667E-03 | 54.77 | Sum | |
| | 39 | 1685.25 | 1.42361E-03 | 65.08 | | |
| | 40 | 1692.21 | 2.22222E-03 | 35.36 | | |
| | 41 | 1730.25 | 6.67201E-03 | 23.20 | Sum | |
| | 43 | 1936.55 | 2.08333E-03 | 44.72 | | |
| | 44 | 1947.13 | 3.05556E-03 | 53.78 | | |
| | 45 | 2102.29 | 4.29012E-03 | 31.88 | | |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.97 | 1460.81 | * | 10.67 | 1.93E+01 | 2.34E+00 |
| CD-109 | 1.00 | 88.03 | * | 3.72 | 2.39E+00 | 1.19E+00 |
| SN-126 | 0.96 | 87.57 | * | 37.00 | 2.08E-01 | 1.03E-01 |
| CS-134 | 0.72 | 563.23 | | 8.38 | | |
| | | 569.32 | | 15.43 | | |
| | | 604.70 | * | 97.60 | 2.78E-02 | 1.80E-02 |
| | | 795.84 | * | 85.40 | 8.66E-02 | 6.77E-02 |
| | | 801.93 | | 8.73 | | |
| CS-137 | 0.99 | 661.65 | * | 85.12 | 6.68E-02 | 4.49E-02 |
| TL-208 | 0.99 | 583.14 | * | 30.22 | 1.10E+00 | 2.49E-01 |
| | | 860.37 | * | 4.48 | 2.19E+00 | 1.50E+00 |
| | | 2614.66 | * | 35.85 | 7.73E-01 | 2.35E-01 |
| BI-212 | 0.95 | 727.17 | * | 11.80 | 7.66E-01 | 4.47E-01 |
| | | 1620.62 | * | 2.75 | 1.21E+00 | 1.49E+00 |
| PB-212 | 1.00 | 238.63 | * | 44.60 | 1.12E+00 | 1.36E-01 |
| | | 300.09 | * | 3.41 | 1.44E+00 | 8.55E-01 |
| BI-214 | 0.97 | 609.31 | * | 46.30 | 9.46E-01 | 1.54E-01 |
| | | 1120.29 | * | 15.10 | 7.30E-01 | 5.33E-01 |
| | | 1764.49 | * | 15.80 | 1.04E+00 | 4.53E-01 |
| | | 2204.22 | * | 4.98 | 8.76E-01 | 6.64E-01 |
| PB-214 | 1.00 | 295.21 | * | 19.19 | 1.08E+00 | 2.07E-01 |
| | | 351.92 | * | 37.19 | 9.17E-01 | 1.68E-01 |
| RA-224 | 0.93 | 240.98 | * | 3.95 | 2.63E+00 | 1.43E+00 |
| RA-226 | 0.99 | 186.21 | * | 3.28 | 2.03E+00 | 3.91E+00 |
| AC-228 | 0.98 | 338.32 | * | 11.40 | 9.91E-01 | 3.34E-01 |
| | | 911.07 | * | 27.70 | 1.16E+00 | 2.90E-01 |
| | | 969.11 | * | 16.60 | 1.07E+00 | 3.70E-01 |
| CM-243 | 0.36 | 209.75 | * | 3.29 | 1.49E+00 | 1.13E+00 |
| | | 228.14 | | 10.60 | | |
| | | 277.60 | * | 14.00 | 2.78E-01 | 3.01E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.979 | 1.93E+01 | 2.34E+00 | |
| ? | CD-109 | 1.000 | 2.39E+00 | 1.19E+00 | |
| ? | SN-126 | 0.961 | 2.08E-01 | 1.03E-01 | |
| | CS-134 | 0.721 | 3.17E-02 | 1.74E-02 | |
| | CS-137 | 0.992 | 6.68E-02 | 4.49E-02 | |
| | TL-208 | 0.991 | 9.44E-01 | 1.70E-01 | |
| | BI-212 | 0.957 | 8.02E-01 | 4.28E-01 | |
| | PB-212 | 1.000 | 1.13E+00 | 1.34E-01 | |
| | BI-214 | 0.975 | 9.37E-01 | 1.38E-01 | |
| | PB-214 | 1.000 | 9.80E-01 | 1.31E-01 | |
| | RA-224 | 0.935 | 2.63E+00 | 1.43E+00 | |
| | RA-226 | 0.990 | 2.03E+00 | 3.91E+00 | |
| | AC-228 | 0.980 | 1.08E+00 | 1.88E-01 | |
| | CM-243 | 0.367 | 3.59E-01 | 2.91E-01 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 11:04:43AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 76.28 | 2.70266E-01 | 7.47 | | |
| | 3 | 93.21 | 3.75722E-02 | 25.14 | Tol. | GA-67 |
| | 4 | 128.43 | 2.33596E-02 | 38.39 | | |
| | 6 | 204.07 | 1.13087E-02 | 56.08 | | |
| | 10 | 269.70 | 1.88621E-02 | 40.73 | | |
| | 14 | 307.52 | 1.12030E-02 | 56.81 | Tol. | LU-176<br>IR-192 |
| | 17 | 408.86 | 1.89873E-02 | 29.91 | | |
| | 18 | 463.19 | 1.53302E-02 | 39.01 | Sum | |
| | 19 | 510.76 | 3.46759E-02 | 18.66 | Sum | |
| | 20 | 533.80 | 7.52096E-03 | 57.67 | Sum | |
| M | 29 | 965.18 | 9.76066E-03 | 32.26 | | |
| | 32 | 1238.87 | 1.26717E-02 | 29.83 | | |
| | 33 | 1378.16 | 5.09259E-03 | 45.80 | Sum | |
| | 35 | 1479.37 | 2.22222E-03 | 65.25 | | |
| | 36 | 1546.45 | 2.63889E-03 | 46.03 | | |
| | 37 | 1590.31 | 4.16667E-03 | 54.77 | Sum | |
| | 39 | 1685.25 | 1.42361E-03 | 65.08 | | |
| | 40 | 1692.21 | 2.22222E-03 | 35.36 | | |
| | 41 | 1730.25 | 6.67201E-03 | 23.20 | Sum | |
| | 43 | 1936.55 | 2.08333E-03 | 44.72 | | |
| | 44 | 1947.13 | 3.05556E-03 | 53.78 | | |
| | 45 | 2102.29 | 4.29012E-03 | 31.88 | | |

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

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | -3.95E-01 | 1.52E+00 | 1.52E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | -3.28E-02 | 7.47E-02 | 7.47E-02 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 0.00E+00 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | 9.50E-03 | 6.17E-02 | 6.17E-02 |
| + | | K-40 | 1460.81 | * | 10.67 | 1.93E+01 | 9.22E-01 | 9.22E-01 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | 2.03E-02 | 4.46E-02 | 4.46E-02 |
| | | | 78.34 | | 96.00 | 7.17E-02 | | 5.31E-02 |
| + | | SC-46 | 889.25 | | 99.98 | 3.72E-02 | 1.59E-01 | 1.59E-01 |
| | | | 1120.51 | | 99.99 | 3.34E-01 | | 2.61E-01 |
| + | | V-48 | 983.52 | | 99.98 | 1.68E+00 | 5.13E+00 | 5.13E+00 |
| | | | 1312.10 | | 97.50 | -1.29E+00 | | 5.64E+00 |
| + | | CR-51 | 320.08 | | 9.83 | 3.98E-01 | 5.65E+00 | 5.65E+00 |
| + | | MN-54 | 834.83 | | 99.97 | -1.96E-02 | 8.76E-02 | 8.76E-02 |
| + | | CO-56 | 846.75 | | 99.96 | -2.08E-02 | 1.56E-01 | 1.56E-01 |
| | | | 1037.75 | | 14.03 | 1.55E-01 | | 1.23E+00 |
| | | | 1238.25 | | 67.00 | 2.93E-01 | | 3.77E-01 |
| | | | 1771.40 | | 15.51 | -2.45E-01 | | 9.38E-01 |
| | | | 2598.48 | | 16.90 | -3.44E-02 | | 5.56E-01 |
| + | | CO-57 | 122.06 | | 85.51 | 1.79E-02 | 4.82E-02 | 4.82E-02 |
| | | | 136.48 | | 10.60 | 1.42E-01 | | 5.21E-01 |
| + | | CO-58 | 810.76 | | 99.40 | 8.22E-02 | 1.77E-01 | 1.77E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | -2.06E-01 | 5.88E-01 | 5.88E-01 |
| | | | 1291.56 | | 43.20 | 5.12E-01 | | 9.76E-01 |
| + | | CO-60 | 1173.22 | | 100.00 | 2.54E-02 | 6.99E-02 | 9.27E-02 |
| | | | 1332.49 | | 100.00 | 1.82E-02 | | 6.99E-02 |
| + | | ZN-65 | 1115.52 | | 50.75 | -6.50E-02 | 2.21E-01 | 2.21E-01 |
| + | | GA-67 | 93.31 | | 35.70 | 4.07E+08 | 1.76E+08 | 1.76E+08 |
| | | | 208.95 | | 2.24 | 1.65E+09 | | 3.15E+09 |
| | | | 300.22 | | 16.00 | 2.76E+08 | | 4.55E+08 |
| + | | SE-75 | 121.11 | | 16.70 | -1.32E-01 | 1.29E-01 | 3.36E-01 |
| | | | 136.00 | | 59.20 | 3.53E-02 | | 1.29E-01 |
| | | | 264.65 | | 59.80 | 3.62E-02 | | 1.31E-01 |
| | | | 279.53 | | 25.20 | 1.87E-01 | | 3.55E-01 |
| | | | 400.65 | | 11.40 | 4.89E-01 | | 7.67E-01 |
| + | | RB-82 | 776.52 | | 13.00 | -5.33E+00 | 7.24E+00 | 7.24E+00 |
| + | | RB-83 | 520.41 | | 46.00 | -4.73E-03 | 2.29E-01 | 2.29E-01 |
| | | | 529.64 | | 30.30 | -5.03E-02 | | 3.47E-01 |
| | | | 552.65 | | 16.40 | -1.90E-01 | | 5.76E-01 |
| + | | KR-85 | 513.99 | | 0.43 | -1.10E+00 | 1.30E+01 | 1.30E+01 |
| + | | SR-85 | 513.99 | | 99.27 | -1.36E-02 | 1.61E-01 | 1.61E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | Y-88 | 898.02 | | 93.40 | 4.79E-02 | 1.15E-01 | 1.35E-01 |
| | | 1836.01 | | 99.38 | 2.70E-02 | | 1.15E-01 |
| + | MO-93 | 263.06 | | 56.72 | -1.45E-02 | 6.35E-02 | 7.75E-02 |
| | | 684.67 | | 99.68 | 1.14E-02 | | 6.49E-02 |
| | | 1477.11 | | 99.08 | 5.66E-03 | | 6.35E-02 |
| + | NB-93M | 16.57 | | 9.43 | 0.00E+00 | 6.82E+00 | 6.82E+00 |
| + | NB-94 | 702.63 | | 100.00 | -2.69E-02 | 5.93E-02 | 5.93E-02 |
| | | 871.10 | | 100.00 | 1.45E-02 | | 6.44E-02 |
| + | NB-95 | 765.79 | | 99.81 | 2.76E-01 | 5.43E-01 | 5.43E-01 |
| + | NB-95M | 235.69 | | 25.00 | -3.81E+08 | 5.06E+07 | 5.06E+07 |
| + | ZR-95 | 724.18 | | 43.70 | -3.79E-02 | 3.55E-01 | 4.57E-01 |
| | | 756.72 | | 55.30 | 1.84E-01 | | 3.55E-01 |
| + | MO-99 | 181.06 | | 6.20 | 6.16E+09 | 3.39E+10 | 5.41E+10 |
| | | 739.58 | | 12.80 | -6.07E+09 | | 3.39E+10 |
| | | 778.00 | | 4.50 | 7.89E+09 | | 1.07E+11 |
| + | RU-103 | 497.08 | | 89.00 | 6.23E-02 | 2.89E-01 | 2.89E-01 |
| + | RU-106 | 621.84 | | 9.80 | 1.10E-01 | 6.96E-01 | 6.96E-01 |
| + | AG-108M | 433.93 | | 89.90 | 1.50E-02 | 4.99E-02 | 4.99E-02 |
| | | 614.37 | | 90.40 | -6.53E-01 | | 6.85E-02 |
| | | 722.95 | | 90.50 | 8.94E-03 | | 6.77E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 2.39E+00 | 1.86E+00 | 1.86E+00 |
| + | AG-110M | 657.75 | | 93.14 | -5.55E-03 | 8.19E-02 | 8.19E-02 |
| | | 677.61 | | 10.53 | -1.30E-01 | | 7.68E-01 |
| | | 706.67 | | 16.46 | 8.30E-02 | | 5.28E-01 |
| | | 763.93 | | 21.98 | -1.86E-01 | | 4.24E-01 |
| | | 884.67 | | 71.63 | 3.31E-02 | | 1.31E-01 |
| | | 1384.27 | | 23.94 | -2.53E-02 | | 3.08E-01 |
| + | CD-113M | 263.70 | | 0.02 | 1.55E+01 | 1.88E+02 | 1.88E+02 |
| + | SN-113 | 255.12 | | 1.93 | -1.44E+00 | 1.34E-01 | 4.03E+00 |
| | | 391.69 | | 64.90 | -5.29E-02 | | 1.34E-01 |
| + | TE123M | 159.00 | | 84.10 | 4.18E-02 | 9.26E-02 | 9.26E-02 |
| + | SB-124 | 602.71 | | 97.87 | -7.38E-02 | 1.86E-01 | 1.86E-01 |
| | | 645.85 | | 7.26 | 1.46E+00 | | 2.76E+00 |
| | | 722.78 | | 11.10 | 3.07E-01 | | 1.65E+00 |
| | | 1691.02 | | 49.00 | -2.32E-02 | | 3.37E-01 |
| + | I-125 | 35.49 | | 6.49 | -4.05E+01 | 5.91E+00 | 5.91E+00 |
| + | SB-125 | 176.33 | | 6.89 | 1.07E-02 | 1.73E-01 | 6.83E-01 |
| | | 427.89 | | 29.33 | 8.69E-02 | | 1.73E-01 |
| | | 463.38 | | 10.35 | 6.74E-01 | | 6.23E-01 |
| | | 600.56 | | 17.80 | 1.38E-02 | | 3.61E-01 |
| | | 635.90 | | 11.32 | -1.19E-01 | | 5.52E-01 |
| + | SB-126 | 414.70 | | 83.30 | 8.97E-01 | 1.27E+01 | 1.27E+01 |
| | | 666.33 | | 99.60 | -7.56E+00 | | 1.64E+01 |
| | | 695.00 | | 99.60 | 7.93E+00 | | 1.74E+01 |
| | | 720.50 | | 53.80 | 3.37E+00 | | 2.72E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 2.08E-01 | 1.61E-01 | 1.61E-01 |
| + | SB-127 | 473.00 | | 25.00 | -1.17E+06 | 1.01E+07 | 1.02E+07 |
| | | 685.20 | | 35.70 | 1.57E+06 | | 1.01E+07 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | SB-127 | 783.80 | | 14.70 | 1.10E+07 | 1.01E+07 | 2.89E+07 |
| + | I-129 | 29.78 | | 57.00 | 2.56E-02 | 4.18E-01 | 4.18E-01 |
| | | 33.60 | | 13.20 | 8.23E+00 | | 2.01E+00 |
| | | 39.58 | | 7.52 | 9.24E-01 | | 1.15E+00 |
| + | I-131 | 284.30 | | 6.05 | 2.43E+03 | 2.82E+02 | 3.88E+03 |
| | | 364.48 | | 81.20 | -1.43E+02 | | 2.82E+02 |
| | | 636.97 | | 7.26 | 2.54E+02 | | 4.28E+03 |
| | | 722.89 | | 1.80 | 2.33E+03 | | 1.76E+04 |
| + | TE-132 | 49.72 | | 13.10 | 2.15E+08 | 7.66E+07 | 4.94E+08 |
| | | 228.16 | | 88.00 | 2.86E+07 | | 7.66E+07 |
| + | BA-133 | 81.00 | | 33.00 | -6.18E-03 | 7.80E-02 | 1.10E-01 |
| | | 302.84 | | 17.80 | -3.35E-01 | | 2.53E-01 |
| | | 356.01 | | 60.00 | 2.16E-02 | | 7.80E-02 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -2.62E+03 | 4.64E+04 | 4.64E+04 |
| + | CS-134 | 563.23 | | 8.38 | 5.55E-03 | 1.07E-01 | 6.75E-01 |
| | | 569.32 | | 15.43 | 3.82E-02 | | 3.67E-01 |
| | | 604.70 | * | 97.60 | 2.78E-02 | | 1.38E-01 |
| | | 795.84 | * | 85.40 | 8.66E-02 | | 1.07E-01 |
| | | 801.93 | | 8.73 | 3.01E-02 | | 7.76E-01 |
| + | CS-135 | 268.24 | | 16.00 | 8.58E-02 | 3.12E-01 | 3.12E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | 1.40E+01 | 9.56E+00 | 1.12E+02 |
| | | 163.89 | | 4.61 | 9.08E+01 | | 1.79E+02 |
| | | 176.55 | | 13.56 | 9.48E-01 | | 6.03E+01 |
| | | 273.65 | | 12.66 | -5.60E+01 | | 6.63E+01 |
| | | 340.57 | | 48.50 | 6.44E-01 | | 2.09E+01 |
| | | 818.50 | | 99.70 | -3.31E+00 | | 9.56E+00 |
| | | 1048.07 | | 79.60 | 1.70E+00 | | 1.72E+01 |
| | | 1235.34 | | 19.70 | -4.54E+00 | | 8.86E+01 |
| + | CS-137 | 661.65 | * | 85.12 | 6.68E-02 | 6.87E-02 | 6.87E-02 |
| + | LA-138 | 788.74 | | 34.00 | 1.30E-02 | 1.04E-01 | 1.99E-01 |
| | | 1435.80 | | 66.00 | -3.58E-03 | | 1.04E-01 |
| + | CE-139 | 165.85 | | 80.35 | -1.08E-02 | 9.13E-02 | 9.13E-02 |
| + | BA-140 | 162.64 | | 6.70 | -7.96E+01 | 4.45E+01 | 1.38E+02 |
| | | 304.84 | | 4.50 | 1.23E+01 | | 2.12E+02 |
| | | 423.70 | | 3.20 | 4.90E+01 | | 3.03E+02 |
| | | 437.55 | | 2.00 | 1.95E+01 | | 4.72E+02 |
| | | 537.32 | | 25.00 | -7.80E+00 | | 4.45E+01 |
| + | LA-140 | 328.77 | | 20.50 | 2.68E+01 | 1.68E+01 | 5.38E+01 |
| | | 487.03 | | 45.50 | 1.28E+01 | | 2.24E+01 |
| | | 815.85 | | 23.50 | -1.96E+01 | | 4.89E+01 |
| | | 1596.49 | | 95.49 | 6.17E+00 | | 1.68E+01 |
| + | CE-141 | 145.44 | | 48.40 | -8.54E-03 | 7.27E-01 | 7.27E-01 |
| + | @ CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | CE-144 | 133.54 | 10.80 | 5.61E-03 | 3.93E-01 | 3.93E-01 |
| + | PM-144 | 476.78 | 42.00 | -3.27E-02 | 7.22E-02 | 1.26E-01 |
| | | 618.01 | 98.60 | 1.27E-02 | | 7.22E-02 |
| | | 696.49 | 99.49 | 2.66E-02 | | 8.07E-02 |
| + | PM-145 | 36.85 | 21.70 | 6.90E-02 | 2.56E-01 | 4.98E-01 |
| | | 37.36 | 39.70 | -9.35E-02 | | 2.56E-01 |
| | | 42.30 | 15.10 | -1.17E-01 | | 3.95E-01 |
| | | 72.40 | 2.31 | -9.19E+00 | | 1.85E+00 |
| + | PM-146 | 453.90 | 39.94 | -7.10E-03 | 1.19E-01 | 1.19E-01 |
| | | 735.90 | 14.01 | 3.03E-01 | | 4.94E-01 |
| | | 747.13 | 13.10 | 2.01E-01 | | 5.25E-01 |
| + | ND-147 | 91.11 | 28.90 | -1.24E+02 | 7.24E+01 | 7.24E+01 |
| | | 531.02 | 13.10 | -6.20E+01 | | 2.00E+02 |
| + | PM-149 | 285.90 | 3.10 | 7.05E+12 | 4.58E+13 | 4.58E+13 |
| + | EU-152 | 121.78 | 20.50 | 5.88E-02 | 1.58E-01 | 1.58E-01 |
| | | 244.69 | 5.40 | -1.29E+00 | | 8.94E-01 |
| | | 344.27 | 19.13 | -9.39E-02 | | 2.31E-01 |
| | | 778.89 | 9.20 | 5.46E-02 | | 7.37E-01 |
| | | 964.01 | 10.40 | -6.42E-01 | | 8.35E-01 |
| | | 1085.78 | 7.22 | 4.14E-01 | | 1.11E+00 |
| | | 1112.02 | 9.60 | 6.01E-01 | | 9.72E-01 |
| | | 1407.95 | 14.94 | 9.44E-02 | | 5.32E-01 |
| + | GD-153 | 97.43 | 31.30 | 1.86E-02 | 1.38E-01 | 1.38E-01 |
| | | 103.18 | 22.20 | -5.63E-02 | | 1.87E-01 |
| + | EU-154 | 123.07 | 40.50 | 2.06E-02 | 7.98E-02 | 7.98E-02 |
| | | 723.30 | 19.70 | 4.19E-02 | | 3.17E-01 |
| | | 873.19 | 11.50 | 3.05E-01 | | 5.84E-01 |
| | | 996.32 | 10.30 | -2.37E-01 | | 6.87E-01 |
| | | 1004.76 | 17.90 | 1.44E-01 | | 4.21E-01 |
| | | 1274.45 | 35.50 | -8.77E-02 | | 2.00E-01 |
| + | EU-155 | 86.50 | 30.90 | 1.64E-01 | 1.51E-01 | 1.51E-01 |
| | | 105.30 | 20.70 | -1.02E-02 | | 1.61E-01 |
| + | EU-156 | 811.77 | 10.40 | 2.78E+00 | 5.41E+01 | 5.41E+01 |
| | | 1153.47 | 7.20 | 3.41E+01 | | 1.06E+02 |
| | | 1230.71 | 8.90 | -9.87E+00 | | 9.35E+01 |
| + | HO-166M | 184.41 | 72.60 | 1.25E-01 | 7.81E-02 | 7.81E-02 |
| | | 280.45 | 29.60 | -1.68E-03 | | 1.57E-01 |
| | | 410.94 | 11.10 | 1.89E-01 | | 4.40E-01 |
| | | 711.69 | 54.10 | 7.14E-02 | | 1.28E-01 |
| + | TM-171 | 66.72 | 0.14 | -9.40E+00 | 3.20E+01 | 3.20E+01 |
| + | HF-172 | 67.35 | 5.31 | 4.00E-01 | 3.15E-01 | 8.78E-01 |
| | | 125.81 | 11.30 | -1.75E-02 | | 3.15E-01 |
| + | LU-172 | 181.53 | 20.60 | -6.33E+02 | 3.39E+03 | 6.35E+03 |
| | | 900.72 | 29.81 | 9.59E+01 | | 5.81E+03 |
| | | 1093.66 | 62.50 | 6.11E+02 | | 3.39E+03 |
| + | LU-173 | 100.72 | 5.24 | 9.26E-02 | 2.78E-01 | 6.92E-01 |
| | | 272.11 | 21.20 | 2.58E-01 | | 2.78E-01 |
| + | HF-175 | 343.40 | 84.00 | 2.62E-02 | 1.39E-01 | 1.39E-01 |
| + | LU-176 | 88.34 | 13.30 | 7.45E-02 | 4.98E-02 | 3.28E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | LU-176 | 201.83 | | 86.00 | 5.78E-03 | 4.98E-02 | 5.51E-02 |
| | | 306.78 | | 94.00 | 3.77E-02 | | 4.98E-02 |
| + | HF-181 | 133.02 | | 41.70 | -2.26E-02 | 2.72E-01 | 3.98E-01 |
| | | 345.85 | | 17.20 | -1.84E-01 | | 1.40E+00 |
| | | 482.03 | | 82.80 | -4.85E-02 | | 2.72E-01 |
| + | TA-182 | 67.75 | | 41.20 | 8.46E-02 | 1.86E-01 | 1.86E-01 |
| | | 1121.30 | | 34.90 | 7.46E-01 | | 6.04E-01 |
| | | 1189.05 | | 16.23 | -1.31E-01 | | 8.61E-01 |
| | | 1221.41 | | 26.98 | -2.64E-02 | | 5.99E-01 |
| | | 1231.02 | | 11.44 | -1.52E-01 | | 1.43E+00 |
| + | IR-192 | 308.46 | | 29.68 | 1.92E-01 | 2.47E-01 | 3.84E-01 |
| | | 468.07 | | 48.10 | 6.10E-02 | | 2.47E-01 |
| + | HG-203 | 279.19 | | 77.30 | 1.12E-01 | 2.90E-01 | 2.90E-01 |
| + | TL-204 | 374.74 | | 94.11 | -1.90E-03 | 5.58E-02 | 5.58E-02 |
| | | 899.15 | | 99.16 | -3.98E-03 | | 6.61E-02 |
| | | 911.74 | | 91.10 | 3.19E-01 | | 1.46E-01 |
| + | BI-207 | 569.67 | | 97.72 | 5.55E-03 | 5.32E-02 | 5.32E-02 |
| | | 1063.62 | | 74.90 | 3.75E-02 | | 1.02E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 1.10E+00 | 2.57E-01 | 3.10E-01 |
| | | 860.37 | * | 4.48 | 2.19E+00 | | 2.35E+00 |
| | | 2614.66 | * | 35.85 | 7.73E-01 | | 2.57E-01 |
| + | BI-210M | 262.00 | | 45.00 | -1.78E-03 | 9.93E-02 | 9.93E-02 |
| | | 300.00 | | 23.00 | 1.33E-01 | | 2.20E-01 |
| + | PB-210 | 46.50 | | 4.25 | 1.36E+00 | 1.38E+00 | 1.38E+00 |
| + | PB-211 | 404.84 | | 2.90 | -4.85E-01 | 1.50E+00 | 1.50E+00 |
| | | 831.96 | | 2.90 | -4.72E-01 | | 2.31E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 7.66E-01 | 6.82E-01 | 6.82E-01 |
| | | 1620.62 | * | 2.75 | 1.21E+00 | | 2.43E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.12E+00 | 2.18E-01 | 2.18E-01 |
| | | 300.09 | * | 3.41 | 1.44E+00 | | 2.71E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 9.46E-01 | 2.76E-01 | 2.76E-01 |
| | | 1120.29 | * | 15.10 | 7.30E-01 | | 8.41E-01 |
| | | 1764.49 | * | 15.80 | 1.04E+00 | | 6.15E-01 |
| | | 2204.22 | * | 4.98 | 8.76E-01 | | 9.05E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 1.08E+00 | 2.03E-01 | 4.79E-01 |
| | | 351.92 | * | 37.19 | 9.17E-01 | | 2.03E-01 |
| + | RN-219 | 401.80 | | 6.50 | -1.50E-01 | 7.06E-01 | 7.06E-01 |
| + | RA-223 | 323.87 | | 3.88 | -1.08E-01 | 1.18E+00 | 1.18E+00 |
| + | RA-224 | 240.98 | * | 3.95 | 2.63E+00 | 2.50E+00 | 2.50E+00 |
| + | RA-225 | 40.00 | | 31.00 | 2.27E+01 | 2.81E+01 | 2.81E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.03E+00 | 1.95E+00 | 1.95E+00 |
| + | TH-227 | 50.10 | | 8.40 | 2.27E-01 | 5.20E-01 | 5.20E-01 |
| | | 236.00 | | 11.50 | -4.43E+00 | | 5.88E-01 |
| | | 256.20 | | 6.30 | -2.21E-01 | | 6.98E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 9.91E-01 | 3.63E-01 | 4.73E-01 |
| | | 911.07 | * | 27.70 | 1.16E+00 | | 3.63E-01 |
| | | 969.11 | * | 16.60 | 1.07E+00 | | 7.64E-01 |
| + | TH-230 | 48.44 | | 16.90 | -2.25E-01 | 2.76E-01 | 2.76E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | TH-230 | 62.85 | | 4.60 | 5.61E-01 | 2.76E-01 | 1.00E+00 |
| | | 67.67 | | 0.37 | 5.17E+00 | | 1.14E+01 |
| + | PA-231 | 283.67 | | 1.60 | 1.77E+00 | 1.92E+00 | 2.83E+00 |
| | | 302.67 | | 2.30 | -2.55E+00 | | 1.92E+00 |
| + | TH-231 | 25.64 | | 14.70 | 0.00E+00 | 1.21E-01 | 1.21E-01 |
| | | 84.21 | | 6.40 | 5.02E-01 | | 6.22E-01 |
| + | PA-233 | 311.98 | | 38.60 | 2.78E-01 | 1.37E+00 | 1.37E+00 |
| + | PA-234 | 131.20 | | 20.40 | -1.57E-01 | 1.59E-01 | 1.59E-01 |
| | | 733.99 | | 8.80 | 0.00E+00 | | 7.44E-01 |
| | | 946.00 | | 12.00 | 1.66E-01 | | 5.69E-01 |
| + | PA-234M | 1001.03 | | 0.92 | 2.45E+00 | 8.41E+00 | 8.41E+00 |
| + | TH-234 | 63.29 | | 3.80 | 1.33E+00 | 1.22E+00 | 1.22E+00 |
| + | U-235 | 143.76 | | 10.50 | -3.68E-02 | 3.99E-01 | 3.99E-01 |
| | | 163.35 | | 4.70 | 4.78E-01 | | 9.41E-01 |
| | | 205.31 | | 4.70 | 5.09E-01 | | 9.79E-01 |
| + | NP-237 | 86.50 | | 12.60 | 3.88E-01 | 3.56E-01 | 3.56E-01 |
| + | NP-239 | 106.10 | | 22.70 | -4.31E+10 | 6.80E+11 | 6.80E+11 |
| | | 228.18 | | 10.70 | 7.70E+11 | | 2.07E+12 |
| | | 277.60 | | 14.10 | 1.92E+12 | | 1.78E+12 |
| + | AM-241 | 59.54 | | 35.90 | 5.21E-02 | 1.24E-01 | 1.24E-01 |
| + | AM-243 | 74.67 | | 66.00 | -1.28E-01 | 8.45E-02 | 8.45E-02 |
| + | CM-243 | 209.75 | * | 3.29 | 1.49E+00 | 4.38E-01 | 1.81E+00 |
| | | 228.14 | | 10.60 | 1.63E-01 | | 4.38E-01 |
| | | 277.60 | * | 14.00 | 2.78E-01 | | 4.92E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.52E+00 | 1.52E+00 | -3.95E-01 | 7.08E-01 |
| | NA-22 | 1274.54 | | 99.94 | 7.47E-02 | 7.47E-02 | -3.28E-02 | 3.38E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 0.00E+00 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 6.17E-02 | 6.17E-02 | 9.50E-03 | 2.66E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 9.22E-01 | 9.22E-01 | 1.93E+01 | 4.26E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 4.46E-02 | 4.46E-02 | 2.03E-02 | 2.16E-02 |
| | | 78.34 | | 96.00 | 5.31E-02 | | 7.17E-02 | 2.59E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.59E-01 | 1.59E-01 | 3.72E-02 | 7.41E-02 |
| | | 1120.51 | | 99.99 | 2.61E-01 | | 3.34E-01 | 1.24E-01 |
| | V-48 | 983.52 | | 99.98 | 5.13E+00 | 5.13E+00 | 1.68E+00 | 2.36E+00 |
| | | 1312.10 | | 97.50 | 5.64E+00 | | -1.29E+00 | 2.56E+00 |
| | CR-51 | 320.08 | | 9.83 | 5.65E+00 | 5.65E+00 | 3.98E-01 | 2.69E+00 |
| | MN-54 | 834.83 | | 99.97 | 8.76E-02 | 8.76E-02 | -1.96E-02 | 4.08E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.56E-01 | 1.56E-01 | -2.08E-02 | 7.24E-02 |
| | | 1037.75 | | 14.03 | 1.23E+00 | | 1.55E-01 | 5.69E-01 |
| | | 1238.25 | | 67.00 | 3.77E-01 | | 2.93E-01 | 1.77E-01 |
| | | 1771.40 | | 15.51 | 9.38E-01 | | -2.45E-01 | 4.04E-01 |
| | | 2598.48 | | 16.90 | 5.56E-01 | | -3.44E-02 | 2.08E-01 |
| | CO-57 | 122.06 | | 85.51 | 4.82E-02 | 4.82E-02 | 1.79E-02 | 2.32E-02 |
| | | 136.48 | | 10.60 | 5.21E-01 | | 1.42E-01 | 2.53E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.77E-01 | 1.77E-01 | 8.22E-02 | 8.24E-02 |
| | FE-59 | 1099.22 | | 56.50 | 5.88E-01 | 5.88E-01 | -2.06E-01 | 2.69E-01 |
| | | 1291.56 | | 43.20 | 9.76E-01 | | 5.12E-01 | 4.51E-01 |
| | CO-60 | 1173.22 | | 100.00 | 9.27E-02 | 6.99E-02 | 2.54E-02 | 4.31E-02 |
| | | 1332.49 | | 100.00 | 6.99E-02 | | 1.82E-02 | 3.14E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 2.21E-01 | 2.21E-01 | -6.50E-02 | 1.02E-01 |
| | GA-67 | 93.31 | | 35.70 | 1.76E+08 | 1.76E+08 | 4.07E+08 | 8.55E+07 |
| | | 208.95 | | 2.24 | 3.15E+09 | | 1.65E+09 | 1.52E+09 |
| | | 300.22 | | 16.00 | 4.55E+08 | | 2.76E+08 | 2.18E+08 |
| | SE-75 | 121.11 | | 16.70 | 3.36E-01 | 1.29E-01 | -1.32E-01 | 1.61E-01 |
| | | 136.00 | | 59.20 | 1.29E-01 | | 3.53E-02 | 6.24E-02 |
| | | 264.65 | | 59.80 | 1.31E-01 | | 3.62E-02 | 6.25E-02 |
| | | 279.53 | | 25.20 | 3.55E-01 | | 1.87E-01 | 1.70E-01 |
| | | 400.65 | | 11.40 | 7.67E-01 | | 4.89E-01 | 3.63E-01 |
| | RB-82 | 776.52 | | 13.00 | 7.24E+00 | 7.24E+00 | -5.33E+00 | 3.37E+00 |
| | RB-83 | 520.41 | | 46.00 | 2.29E-01 | 2.29E-01 | -4.73E-03 | 1.07E-01 |
| | | 529.64 | | 30.30 | 3.47E-01 | | -5.03E-02 | 1.62E-01 |
| | | 552.65 | | 16.40 | 5.76E-01 | | -1.90E-01 | 2.65E-01 |
| | KR-85 | 513.99 | | 0.43 | 1.30E+01 | 1.30E+01 | -1.10E+00 | 6.11E+00 |
| | SR-85 | 513.99 | | 99.27 | 1.61E-01 | 1.61E-01 | -1.36E-02 | 7.58E-02 |
| | Y-88 | 898.02 | | 93.40 | 1.35E-01 | 1.15E-01 | 4.79E-02 | 6.23E-02 |
| | | 1836.01 | | 99.38 | 1.15E-01 | | 2.70E-02 | 4.93E-02 |
| | MO-93 | 263.06 | | 56.72 | 7.75E-02 | 6.35E-02 | -1.45E-02 | 3.70E-02 |
| | | 684.67 | | 99.68 | 6.49E-02 | | 1.14E-02 | 3.04E-02 |
| | | 1477.11 | | 99.08 | 6.35E-02 | | 5.66E-03 | 2.79E-02 |
| | NB-93M | 16.57 | | 9.43 | 6.82E+00 | 6.82E+00 | 0.00E+00 | 0.00E+00 |
| | NB-94 | 702.63 | | 100.00 | 5.93E-02 | 5.93E-02 | -2.69E-02 | 2.76E-02 |
| | | 871.10 | | 100.00 | 6.44E-02 | | 1.45E-02 | 2.98E-02 |
| | NB-95 | 765.79 | | 99.81 | 5.43E-01 | 5.43E-01 | 2.76E-01 | 2.56E-01 |
| | NB-95M | 235.69 | | 25.00 | 5.06E+07 | 5.06E+07 | -3.81E+08 | 2.46E+07 |
| | ZR-95 | 724.18 | | 43.70 | 4.57E-01 | 3.55E-01 | -3.79E-02 | 2.14E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | ZR-95 | 756.72 | | 55.30 | 3.55E-01 | 3.55E-01 | 1.84E-01 | 1.66E-01 |
| | MO-99 | 181.06 | | 6.20 | 5.41E+10 | 3.39E+10 | 6.16E+09 | 2.62E+10 |
| | | 739.58 | | 12.80 | 3.39E+10 | | -6.07E+09 | 1.57E+10 |
| | | 778.00 | | 4.50 | 1.07E+11 | | 7.89E+09 | 4.97E+10 |
| | RU-103 | 497.08 | | 89.00 | 2.89E-01 | 2.89E-01 | 6.23E-02 | 1.34E-01 |
| | RU-106 | 621.84 | | 9.80 | 6.96E-01 | 6.96E-01 | 1.10E-01 | 3.25E-01 |
| | AG-108M | 433.93 | | 89.90 | 4.99E-02 | 4.99E-02 | 1.50E-02 | 2.34E-02 |
| | | 614.37 | | 90.40 | 6.85E-02 | | -6.53E-01 | 3.22E-02 |
| | | 722.95 | | 90.50 | 6.77E-02 | | 8.94E-03 | 3.15E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 1.86E+00 | 1.86E+00 | 2.39E+00 | 9.13E-01 |
| | AG-110M | 657.75 | | 93.14 | 8.19E-02 | 8.19E-02 | -5.55E-03 | 3.82E-02 |
| | | 677.61 | | 10.53 | 7.68E-01 | | -1.30E-01 | 3.59E-01 |
| | | 706.67 | | 16.46 | 5.28E-01 | | 8.30E-02 | 2.48E-01 |
| | | 763.93 | | 21.98 | 4.24E-01 | | -1.86E-01 | 1.99E-01 |
| | | 884.67 | | 71.63 | 1.31E-01 | | 3.31E-02 | 6.07E-02 |
| | | 1384.27 | | 23.94 | 3.08E-01 | | -2.53E-02 | 1.34E-01 |
| | CD-113M | 263.70 | | 0.02 | 1.88E+02 | 1.88E+02 | 1.55E+01 | 8.98E+01 |
| | SN-113 | 255.12 | | 1.93 | 4.03E+00 | 1.34E-01 | -1.44E+00 | 1.93E+00 |
| | | 391.69 | | 64.90 | 1.34E-01 | | -5.29E-02 | 6.32E-02 |
| | TE123M | 159.00 | | 84.10 | 9.26E-02 | 9.26E-02 | 4.18E-02 | 4.48E-02 |
| | SB-124 | 602.71 | | 97.87 | 1.86E-01 | 1.86E-01 | -7.38E-02 | 8.73E-02 |
| | | 645.85 | | 7.26 | 2.76E+00 | | 1.46E+00 | 1.30E+00 |
| | | 722.78 | | 11.10 | 1.65E+00 | | 3.07E-01 | 7.64E-01 |
| | | 1691.02 | | 49.00 | 3.37E-01 | | -2.32E-02 | 1.43E-01 |
| | I-125 | 35.49 | | 6.49 | 5.91E+00 | 5.91E+00 | -4.05E+01 | 2.86E+00 |
| | SB-125 | 176.33 | | 6.89 | 6.83E-01 | 1.73E-01 | 1.07E-02 | 3.30E-01 |
| | | 427.89 | | 29.33 | 1.73E-01 | | 8.69E-02 | 8.12E-02 |
| | | 463.38 | | 10.35 | 6.23E-01 | | 6.74E-01 | 2.96E-01 |
| | | 600.56 | | 17.80 | 3.61E-01 | | 1.38E-02 | 1.70E-01 |
| | | 635.90 | | 11.32 | 5.52E-01 | | -1.19E-01 | 2.58E-01 |
| | SB-126 | 414.70 | | 83.30 | 1.27E+01 | 1.27E+01 | 8.97E-01 | 5.94E+00 |
| | | 666.33 | | 99.60 | 1.64E+01 | | -7.56E+00 | 7.69E+00 |
| | | 695.00 | | 99.60 | 1.74E+01 | | 7.93E+00 | 8.15E+00 |
| | | 720.50 | | 53.80 | 2.72E+01 | | 3.37E+00 | 1.26E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 1.61E-01 | 1.61E-01 | 2.08E-01 | 7.92E-02 |
| | SB-127 | 473.00 | | 25.00 | 1.02E+07 | 1.01E+07 | -1.17E+06 | 4.73E+06 |
| | | 685.20 | | 35.70 | 1.01E+07 | | 1.57E+06 | 4.73E+06 |
| | | 783.80 | | 14.70 | 2.89E+07 | | 1.10E+07 | 1.36E+07 |
| | I-129 | 29.78 | | 57.00 | 4.18E-01 | 4.18E-01 | 2.56E-02 | 2.02E-01 |
| | | 33.60 | | 13.20 | 2.01E+00 | | 8.23E+00 | 9.87E-01 |
| | | 39.58 | | 7.52 | 1.15E+00 | | 9.24E-01 | 5.53E-01 |
| | I-131 | 284.30 | | 6.05 | 3.88E+03 | 2.82E+02 | 2.43E+03 | 1.85E+03 |
| | | 364.48 | | 81.20 | 2.82E+02 | | -1.43E+02 | 1.33E+02 |
| | | 636.97 | | 7.26 | 4.28E+03 | | 2.54E+02 | 2.00E+03 |
| | | 722.89 | | 1.80 | 1.76E+04 | | 2.33E+03 | 8.19E+03 |
| | TE-132 | 49.72 | | 13.10 | 4.94E+08 | 7.66E+07 | 2.15E+08 | 2.37E+08 |
| | | 228.16 | | 88.00 | 7.66E+07 | | 2.86E+07 | 3.68E+07 |
| | BA-133 | 81.00 | | 33.00 | 1.10E-01 | 7.80E-02 | -6.18E-03 | 5.30E-02 |
| | | 302.84 | | 17.80 | 2.53E-01 | | -3.35E-01 | 1.20E-01 |
| | | 356.01 | | 60.00 | 7.80E-02 | | 2.16E-02 | 3.69E-02 |
| | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | XE-133 | 81.00 | | 38.00 | 4.64E+04 | 4.64E+04 | -2.62E+03 | 2.25E+04 |
| + | CS-134 | 563.23 | | 8.38 | 6.75E-01 | 1.07E-01 | 5.55E-03 | 3.15E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | CS-134 | 569.32 | | 15.43 | 3.67E-01 | 1.07E-01 | 3.82E-02 | 1.71E-01 |
| | | 604.70 | * | 97.60 | 1.38E-01 | | 2.78E-02 | 6.71E-02 |
| | | 795.84 | * | 85.40 | 1.07E-01 | | 8.66E-02 | 5.06E-02 |
| | | 801.93 | | 8.73 | 7.76E-01 | | 3.01E-02 | 3.59E-01 |
| | CS-135 | 268.24 | | 16.00 | 3.12E-01 | 3.12E-01 | 8.58E-02 | 1.50E-01 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CS-136 | 153.22 | | 7.46 | 1.12E+02 | 9.56E+00 | 1.40E+01 | 5.42E+01 |
| | | 163.89 | | 4.61 | 1.79E+02 | | 9.08E+01 | 8.64E+01 |
| | | 176.55 | | 13.56 | 6.03E+01 | | 9.48E-01 | 2.91E+01 |
| | | 273.65 | | 12.66 | 6.63E+01 | | -5.60E+01 | 3.16E+01 |
| | | 340.57 | | 48.50 | 2.09E+01 | | 6.44E-01 | 9.98E+00 |
| | | 818.50 | | 99.70 | 9.56E+00 | | -3.31E+00 | 4.35E+00 |
| | | 1048.07 | | 79.60 | 1.72E+01 | | 1.70E+00 | 7.93E+00 |
| | | 1235.34 | | 19.70 | 8.86E+01 | | -4.54E+00 | 4.12E+01 |
| + | CS-137 | 661.65 | * | 85.12 | 6.87E-02 | 6.87E-02 | 6.68E-02 | 3.20E-02 |
| | LA-138 | 788.74 | | 34.00 | 1.99E-01 | 1.04E-01 | 1.30E-02 | 9.27E-02 |
| | | 1435.80 | | 66.00 | 1.04E-01 | | -3.58E-03 | 4.66E-02 |
| | CE-139 | 165.85 | | 80.35 | 9.13E-02 | 9.13E-02 | -1.08E-02 | 4.42E-02 |
| | BA-140 | 162.64 | | 6.70 | 1.38E+02 | 4.45E+01 | -7.96E+01 | 6.65E+01 |
| | | 304.84 | | 4.50 | 2.12E+02 | | 1.23E+01 | 1.01E+02 |
| | | 423.70 | | 3.20 | 3.03E+02 | | 4.90E+01 | 1.42E+02 |
| | | 437.55 | | 2.00 | 4.72E+02 | | 1.95E+01 | 2.21E+02 |
| | | 537.32 | | 25.00 | 4.45E+01 | | -7.80E+00 | 2.08E+01 |
| | LA-140 | 328.77 | | 20.50 | 5.38E+01 | 1.68E+01 | 2.68E+01 | 2.57E+01 |
| | | 487.03 | | 45.50 | 2.24E+01 | | 1.28E+01 | 1.05E+01 |
| | | 815.85 | | 23.50 | 4.89E+01 | | -1.96E+01 | 2.23E+01 |
| | | 1596.49 | | 95.49 | 1.68E+01 | | 6.17E+00 | 7.52E+00 |
| | CE-141 | 145.44 | | 48.40 | 7.27E-01 | 7.27E-01 | -8.54E-03 | 3.52E-01 |
| @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-144 | 133.54 | | 10.80 | 3.93E-01 | 3.93E-01 | 5.61E-03 | 1.89E-01 |
| | PM-144 | 476.78 | | 42.00 | 1.26E-01 | 7.22E-02 | -3.27E-02 | 5.86E-02 |
| | | 618.01 | | 98.60 | 7.22E-02 | | 1.27E-02 | 3.38E-02 |
| | | 696.49 | | 99.49 | 8.07E-02 | | 2.66E-02 | 3.79E-02 |
| | PM-145 | 36.85 | | 21.70 | 4.98E-01 | 2.56E-01 | 6.90E-02 | 2.41E-01 |
| | | 37.36 | | 39.70 | 2.56E-01 | | -9.35E-02 | 1.23E-01 |
| | | 42.30 | | 15.10 | 3.95E-01 | | -1.17E-01 | 1.89E-01 |
| | | 72.40 | | 2.31 | 1.85E+00 | | -9.19E+00 | 8.99E-01 |
| | PM-146 | 453.90 | | 39.94 | 1.19E-01 | 1.19E-01 | -7.10E-03 | 5.59E-02 |
| | | 735.90 | | 14.01 | 4.94E-01 | | 3.03E-01 | 2.31E-01 |
| | | 747.13 | | 13.10 | 5.25E-01 | | 2.01E-01 | 2.45E-01 |
| | ND-147 | 91.11 | | 28.90 | 7.24E+01 | 7.24E+01 | -1.24E+02 | 3.51E+01 |
| | | 531.02 | | 13.10 | 2.00E+02 | | -6.20E+01 | 9.35E+01 |
| | PM-149 | 285.90 | | 3.10 | 4.58E+13 | 4.58E+13 | 7.05E+12 | 2.18E+13 |
| | EU-152 | 121.78 | | 20.50 | 1.58E-01 | 1.58E-01 | 5.88E-02 | 7.59E-02 |
| | | 244.69 | | 5.40 | 8.94E-01 | | -1.29E+00 | 4.29E-01 |
| | | 344.27 | | 19.13 | 2.31E-01 | | -9.39E-02 | 1.09E-01 |
| | | 778.89 | | 9.20 | 7.37E-01 | | 5.46E-02 | 3.44E-01 |
| | | 964.01 | | 10.40 | 8.35E-01 | | -6.42E-01 | 3.91E-01 |
| | | 1085.78 | | 7.22 | 1.11E+00 | | 4.14E-01 | 5.16E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | EU-152 | 1112.02 | | 9.60 | 9.72E-01 | 1.58E-01 | 6.01E-01 | 4.54E-01 |
| | | 1407.95 | | 14.94 | 5.32E-01 | | 9.44E-02 | 2.41E-01 |
| | GD-153 | 97.43 | | 31.30 | 1.38E-01 | 1.38E-01 | 1.86E-02 | 6.64E-02 |
| | | 103.18 | | 22.20 | 1.87E-01 | | -5.63E-02 | 9.01E-02 |
| | EU-154 | 123.07 | | 40.50 | 7.98E-02 | 7.98E-02 | 2.06E-02 | 3.83E-02 |
| | | 723.30 | | 19.70 | 3.17E-01 | | 4.19E-02 | 1.48E-01 |
| | | 873.19 | | 11.50 | 5.84E-01 | | 3.05E-01 | 2.70E-01 |
| | | 996.32 | | 10.30 | 6.87E-01 | | -2.37E-01 | 3.16E-01 |
| | | 1004.76 | | 17.90 | 4.21E-01 | | 1.44E-01 | 1.95E-01 |
| | | 1274.45 | | 35.50 | 2.00E-01 | | -8.77E-02 | 9.04E-02 |
| | EU-155 | 86.50 | | 30.90 | 1.51E-01 | 1.51E-01 | 1.64E-01 | 7.33E-02 |
| | | 105.30 | | 20.70 | 1.61E-01 | | -1.02E-02 | 7.77E-02 |
| | EU-156 | 811.77 | | 10.40 | 5.41E+01 | 5.41E+01 | 2.78E+00 | 2.50E+01 |
| | | 1153.47 | | 7.20 | 1.06E+02 | | 3.41E+01 | 4.90E+01 |
| | | 1230.71 | | 8.90 | 9.35E+01 | | -9.87E+00 | 4.34E+01 |
| | HO-166M | 184.41 | | 72.60 | 7.81E-02 | 7.81E-02 | 1.25E-01 | 3.80E-02 |
| | | 280.45 | | 29.60 | 1.57E-01 | | -1.68E-03 | 7.51E-02 |
| | | 410.94 | | 11.10 | 4.40E-01 | | 1.89E-01 | 2.08E-01 |
| | | 711.69 | | 54.10 | 1.28E-01 | | 7.14E-02 | 6.01E-02 |
| | TM-171 | 66.72 | | 0.14 | 3.20E+01 | 3.20E+01 | -9.40E+00 | 1.55E+01 |
| | HF-172 | 67.35 | | 5.31 | 8.78E-01 | 3.15E-01 | 4.00E-01 | 4.26E-01 |
| | | 125.81 | | 11.30 | 3.15E-01 | | -1.75E-02 | 1.51E-01 |
| | LU-172 | 181.53 | | 20.60 | 6.35E+03 | 3.39E+03 | -6.33E+02 | 3.07E+03 |
| | | 900.72 | | 29.81 | 5.81E+03 | | 9.59E+01 | 2.66E+03 |
| | | 1093.66 | | 62.50 | 3.39E+03 | | 6.11E+02 | 1.56E+03 |
| | LU-173 | 100.72 | | 5.24 | 6.92E-01 | 2.78E-01 | 9.26E-02 | 3.33E-01 |
| | | 272.11 | | 21.20 | 2.78E-01 | | 2.58E-01 | 1.34E-01 |
| | HF-175 | 343.40 | | 84.00 | 1.39E-01 | 1.39E-01 | 2.62E-02 | 6.58E-02 |
| | LU-176 | 88.34 | | 13.30 | 3.28E-01 | 4.98E-02 | 7.45E-02 | 1.60E-01 |
| | | 201.83 | | 86.00 | 5.51E-02 | | 5.78E-03 | 2.66E-02 |
| | | 306.78 | | 94.00 | 4.98E-02 | | 3.77E-02 | 2.37E-02 |
| | HF-181 | 133.02 | | 41.70 | 3.98E-01 | 2.72E-01 | -2.26E-02 | 1.91E-01 |
| | | 345.85 | | 17.20 | 1.40E+00 | | -1.84E-01 | 6.66E-01 |
| | | 482.03 | | 82.80 | 2.72E-01 | | -4.85E-02 | 1.27E-01 |
| | TA-182 | 67.75 | | 41.20 | 1.86E-01 | 1.86E-01 | 8.46E-02 | 9.02E-02 |
| | | 1121.30 | | 34.90 | 6.04E-01 | | 7.46E-01 | 2.86E-01 |
| | | 1189.05 | | 16.23 | 8.61E-01 | | -1.31E-01 | 3.95E-01 |
| | | 1221.41 | | 26.98 | 5.99E-01 | | -2.64E-02 | 2.78E-01 |
| | | 1231.02 | | 11.44 | 1.43E+00 | | -1.52E-01 | 6.66E-01 |
| | IR-192 | 308.46 | | 29.68 | 3.84E-01 | 2.47E-01 | 1.92E-01 | 1.83E-01 |
| | | 468.07 | | 48.10 | 2.47E-01 | | 6.10E-02 | 1.16E-01 |
| | HG-203 | 279.19 | | 77.30 | 2.90E-01 | 2.90E-01 | 1.12E-01 | 1.39E-01 |
| | TL-204 | 374.74 | | 94.11 | 5.58E-02 | 5.58E-02 | -1.90E-03 | 2.65E-02 |
| | | 899.15 | | 99.16 | 6.61E-02 | | -3.98E-03 | 3.04E-02 |
| | | 911.74 | | 91.10 | 1.46E-01 | | 3.19E-01 | 7.02E-02 |
| | BI-207 | 569.67 | | 97.72 | 5.32E-02 | 5.32E-02 | 5.55E-03 | 2.48E-02 |
| | | 1063.62 | | 74.90 | 1.02E-01 | | 3.75E-02 | 4.71E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 3.10E-01 | 2.57E-01 | 1.10E+00 | 1.49E-01 |
| | | 860.37 | * | 4.48 | 2.35E+00 | | 2.19E+00 | 1.12E+00 |
| | | 2614.66 | * | 35.85 | 2.57E-01 | | 7.73E-01 | 1.15E-01 |
| | BI-210M | 262.00 | | 45.00 | 9.93E-02 | 9.93E-02 | -1.78E-03 | 4.75E-02 |
| | | 300.00 | | 23.00 | 2.20E-01 | | 1.33E-01 | 1.05E-01 |
| | PB-210 | 46.50 | | 4.25 | 1.38E+00 | 1.38E+00 | 1.36E+00 | 6.67E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | PB-211 | 404.84 | | 2.90 | 1.50E+00 | 1.50E+00 | -4.85E-01 | 7.06E-01 |
| | | 831.96 | | 2.90 | 2.31E+00 | | -4.72E-01 | 1.07E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 6.82E-01 | 6.82E-01 | 7.66E-01 | 3.23E-01 |
| | | 1620.62 | * | 2.75 | 2.43E+00 | | 1.21E+00 | 1.07E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 2.18E-01 | 2.18E-01 | 1.12E+00 | 1.07E-01 |
| | | 300.09 | * | 3.41 | 2.71E+00 | | 1.44E+00 | 1.32E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 2.76E-01 | 2.76E-01 | 9.46E-01 | 1.34E-01 |
| | | 1120.29 | * | 15.10 | 8.41E-01 | | 7.30E-01 | 4.01E-01 |
| | | 1764.49 | * | 15.80 | 6.15E-01 | | 1.04E+00 | 2.81E-01 |
| | | 2204.22 | * | 4.98 | 9.05E-01 | | 8.76E-01 | 3.58E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 4.79E-01 | 2.03E-01 | 1.08E+00 | 2.34E-01 |
| | | 351.92 | * | 37.19 | 2.03E-01 | | 9.17E-01 | 9.84E-02 |
| | RN-219 | 401.80 | | 6.50 | 7.06E-01 | 7.06E-01 | -1.50E-01 | 3.32E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.18E+00 | 1.18E+00 | -1.08E-01 | 5.63E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 2.50E+00 | 2.50E+00 | 2.63E+00 | 1.23E+00 |
| | RA-225 | 40.00 | | 31.00 | 2.81E+01 | 2.81E+01 | 2.27E+01 | 1.36E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.95E+00 | 1.95E+00 | 2.03E+00 | 9.49E-01 |
| | TH-227 | 50.10 | | 8.40 | 5.20E-01 | 5.20E-01 | 2.27E-01 | 2.50E-01 |
| | | 236.00 | | 11.50 | 5.88E-01 | | -4.43E+00 | 2.86E-01 |
| | | 256.20 | | 6.30 | 6.98E-01 | | -2.21E-01 | 3.34E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 4.73E-01 | 3.63E-01 | 9.91E-01 | 2.26E-01 |
| | | 911.07 | * | 27.70 | 3.63E-01 | | 1.16E+00 | 1.72E-01 |
| | | 969.11 | * | 16.60 | 7.64E-01 | | 1.07E+00 | 3.66E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.76E-01 | 2.76E-01 | -2.25E-01 | 1.33E-01 |
| | | 62.85 | | 4.60 | 1.00E+00 | | 5.61E-01 | 4.88E-01 |
| | | 67.67 | | 0.37 | 1.14E+01 | | 5.17E+00 | 5.51E+00 |
| | PA-231 | 283.67 | | 1.60 | 2.83E+00 | 1.92E+00 | 1.77E+00 | 1.35E+00 |
| | | 302.67 | | 2.30 | 1.92E+00 | | -2.55E+00 | 9.15E-01 |
| | TH-231 | 25.64 | | 14.70 | 1.21E-01 | 1.21E-01 | 0.00E+00 | 0.00E+00 |
| | | 84.21 | | 6.40 | 6.22E-01 | | 5.02E-01 | 3.02E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.37E+00 | 1.37E+00 | 2.78E-01 | 6.47E-01 |
| | PA-234 | 131.20 | | 20.40 | 1.59E-01 | 1.59E-01 | -1.57E-01 | 7.61E-02 |
| | | 733.99 | | 8.80 | 7.44E-01 | | 0.00E+00 | 3.48E-01 |
| | | 946.00 | | 12.00 | 5.69E-01 | | 1.66E-01 | 2.63E-01 |
| | PA-234M | 1001.03 | | 0.92 | 8.41E+00 | 8.41E+00 | 2.45E+00 | 3.91E+00 |
| | TH-234 | 63.29 | | 3.80 | 1.22E+00 | 1.22E+00 | 1.33E+00 | 5.91E-01 |
| | U-235 | 143.76 | | 10.50 | 3.99E-01 | 3.99E-01 | -3.68E-02 | 1.93E-01 |
| | | 163.35 | | 4.70 | 9.41E-01 | | 4.78E-01 | 4.55E-01 |
| | | 205.31 | | 4.70 | 9.79E-01 | | 5.09E-01 | 4.72E-01 |
| | NP-237 | 86.50 | | 12.60 | 3.56E-01 | 3.56E-01 | 3.88E-01 | 1.73E-01 |
| | NP-239 | 106.10 | | 22.70 | 6.80E+11 | 6.80E+11 | -4.31E+10 | 3.28E+11 |
| | | 228.18 | | 10.70 | 2.07E+12 | | 7.70E+11 | 9.93E+11 |
| | | 277.60 | | 14.10 | 1.78E+12 | | 1.92E+12 | 8.57E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.24E-01 | 1.24E-01 | 5.21E-02 | 6.01E-02 |
| | AM-243 | 74.67 | | 66.00 | 8.45E-02 | 8.45E-02 | -1.28E-01 | 4.14E-02 |
| + | CM-243 | 209.75 | * | 3.29 | 1.81E+00 | 4.38E-01 | 1.49E+00 | 8.81E-01 |
| | | 228.14 | | 10.60 | 4.38E-01 | | 1.63E-01 | 2.11E-01 |
| | | 277.60 | * | 14.00 | 4.92E-01 | | 2.78E-01 | 2.39E-01 |

Analysis Report for 1707087-07

HTC-A03-S002-1824-01

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

No Action Level results available for reporting purposes.

## DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-1824-01

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 41 | 104 | 125 | 157 |
| 33: | 185 | 671 | 93 | 100 | 96 | 86 | 89 | 100 |
| 41: | 90 | 64 | 51 | 66 | 55 | 72 | 131 | 66 |
| 49: | 68 | 65 | 62 | 50 | 84 | 80 | 81 | 86 |
| 57: | 76 | 83 | 115 | 89 | 117 | 101 | 124 | 158 |
| 65: | 106 | 92 | 123 | 107 | 121 | 109 | 109 | 131 |
| 73: | 129 | 123 | 367 | 202 | 391 | 375 | 100 | 114 |
| 81: | 88 | 85 | 96 | 124 | 145 | 98 | 186 | 186 |
| 89: | 102 | 159 | 121 | 91 | 204 | 151 | 91 | 64 |
| 97: | 79 | 81 | 80 | 83 | 72 | 70 | 68 | 80 |
| 105: | 84 | 89 | 56 | 77 | 86 | 68 | 70 | 63 |
| 113: | 85 | 75 | 63 | 66 | 69 | 62 | 73 | 74 |
| 121: | 58 | 70 | 78 | 52 | 62 | 70 | 71 | 78 |
| 129: | 117 | 74 | 56 | 68 | 75 | 58 | 74 | 69 |
| 137: | 67 | 76 | 56 | 67 | 73 | 54 | 63 | 73 |
| 145: | 71 | 48 | 57 | 65 | 63 | 65 | 67 | 64 |
| 153: | 63 | 71 | 68 | 64 | 77 | 52 | 64 | 67 |
| 161: | 44 | 47 | 63 | 66 | 60 | 64 | 57 | 52 |
| 169: | 61 | 59 | 53 | 46 | 48 | 52 | 50 | 53 |
| 177: | 54 | 51 | 62 | 55 | 60 | 59 | 60 | 47 |
| 185: | 70 | 159 | 95 | 50 | 44 | 54 | 42 | 51 |
| 193: | 57 | 61 | 60 | 59 | 53 | 43 | 53 | 60 |
| 201: | 48 | 49 | 49 | 58 | 60 | 35 | 41 | 36 |
| 209: | 67 | 77 | 51 | 55 | 43 | 46 | 49 | 43 |
| 217: | 46 | 39 | 59 | 48 | 50 | 59 | 37 | 44 |
| 225: | 44 | 36 | 49 | 37 | 43 | 46 | 32 | 35 |
| 233: | 49 | 56 | 44 | 51 | 45 | 248 | 498 | 98 |
| 241: | 85 | 105 | 61 | 37 | 30 | 26 | 50 | 35 |
| 249: | 29 | 29 | 31 | 29 | 31 | 34 | 31 | 30 |
| 257: | 28 | 39 | 40 | 40 | 31 | 24 | 35 | 32 |
| 265: | 28 | 27 | 33 | 33 | 33 | 71 | 43 | 30 |
| 273: | 31 | 30 | 26 | 38 | 40 | 56 | 35 | 39 |
| 281: | 27 | 32 | 26 | 30 | 32 | 28 | 19 | 33 |
| 289: | 27 | 31 | 28 | 37 | 25 | 45 | 177 | 109 |
| 297: | 32 | 27 | 21 | 65 | 35 | 24 | 23 | 20 |
| 305: | 26 | 26 | 31 | 25 | 33 | 19 | 21 | 17 |
| 313: | 20 | 29 | 17 | 18 | 27 | 24 | 29 | 24 |
| 321: | 26 | 27 | 24 | 32 | 17 | 25 | 26 | 32 |
| 329: | 37 | 28 | 29 | 24 | 30 | 31 | 18 | 21 |
| 337: | 20 | 94 | 91 | 17 | 21 | 17 | 19 | 19 |
| 345: | 27 | 20 | 27 | 29 | 29 | 22 | 110 | 280 |
| 353: | 82 | 18 | 23 | 22 | 24 | 21 | 15 | 19 |
| 361: | 18 | 15 | 24 | 23 | 18 | 16 | 28 | 9 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 14 | 23 | 20 | 16 | 24 | 19 | 26 | 23 |

Sample Title: HTC-A03-S002-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 27 | 30 | 27 | 20 | 28 | 21 | 24 | 18 |
| 385: | 18 | 28 | 27 | 18 | 26 | 26 | 20 | 17 |
| 393: | 19 | 19 | 23 | 21 | 20 | 24 | 23 | 16 |
| 401: | 20 | 28 | 17 | 8 | 18 | 16 | 20 | 23 |
| 409: | 28 | 24 | 20 | 16 | 10 | 12 | 16 | 20 |
| 417: | 10 | 16 | 20 | 22 | 16 | 20 | 13 | 15 |
| 425: | 9 | 21 | 13 | 15 | 18 | 19 | 15 | 14 |
| 433: | 20 | 18 | 15 | 8 | 11 | 14 | 22 | 10 |
| 441: | 16 | 13 | 9 | 14 | 20 | 15 | 12 | 13 |
| 449: | 17 | 15 | 15 | 18 | 14 | 12 | 16 | 14 |
| 457: | 14 | 17 | 13 | 16 | 14 | 33 | 39 | 20 |
| 465: | 20 | 16 | 9 | 17 | 13 | 18 | 12 | 13 |
| 473: | 13 | 13 | 13 | 11 | 14 | 13 | 10 | 17 |
| 481: | 13 | 12 | 11 | 9 | 13 | 17 | 16 | 12 |
| 489: | 11 | 10 | 7 | 8 | 10 | 7 | 8 | 14 |
| 497: | 17 | 15 | 6 | 15 | 8 | 16 | 10 | 8 |
| 505: | 11 | 13 | 14 | 13 | 20 | 59 | 95 | 40 |
| 513: | 19 | 9 | 11 | 10 | 13 | 11 | 17 | 13 |
| 521: | 15 | 7 | 14 | 13 | 12 | 18 | 17 | 7 |
| 529: | 11 | 11 | 15 | 13 | 18 | 16 | 23 | 10 |
| 537: | 13 | 15 | 10 | 10 | 19 | 12 | 10 | 7 |
| 545: | 14 | 9 | 17 | 11 | 15 | 9 | 6 | 12 |
| 553: | 9 | 9 | 11 | 9 | 13 | 6 | 15 | 9 |
| 561: | 6 | 16 | 16 | 17 | 11 | 12 | 16 | 12 |
| 569: | 22 | 6 | 9 | 11 | 14 | 11 | 15 | 11 |
| 577: | 7 | 14 | 19 | 19 | 19 | 45 | 160 | 68 |
| 585: | 11 | 13 | 15 | 13 | 11 | 6 | 8 | 8 |
| 593: | 12 | 17 | 10 | 11 | 18 | 15 | 6 | 9 |
| 601: | 15 | 11 | 8 | 18 | 9 | 14 | 18 | 56 |
| 609: | 176 | 116 | 15 | 8 | 6 | 12 | 9 | 16 |
| 617: | 18 | 9 | 7 | 9 | 7 | 8 | 12 | 15 |
| 625: | 10 | 9 | 11 | 10 | 5 | 13 | 11 | 10 |
| 633: | 6 | 9 | 6 | 12 | 17 | 9 | 11 | 10 |
| 641: | 14 | 10 | 14 | 8 | 15 | 12 | 15 | 10 |
| 649: | 9 | 6 | 6 | 12 | 8 | 11 | 10 | 8 |
| 657: | 4 | 9 | 8 | 15 | 21 | 31 | 8 | 12 |
| 665: | 12 | 16 | 8 | 8 | 14 | 12 | 12 | 14 |
| 673: | 14 | 7 | 11 | 15 | 5 | 9 | 7 | 16 |
| 681: | 10 | 7 | 17 | 8 | 14 | 7 | 11 | 9 |
| 689: | 7 | 7 | 10 | 13 | 10 | 13 | 11 | 8 |
| 697: | 17 | 10 | 10 | 8 | 7 | 8 | 8 | 12 |
| 705: | 8 | 12 | 7 | 16 | 13 | 8 | 16 | 10 |
| 713: | 15 | 5 | 2 | 13 | 7 | 6 | 8 | 14 |
| 721: | 7 | 4 | 8 | 5 | 10 | 14 | 30 | 29 |
| 729: | 9 | 14 | 7 | 11 | 10 | 7 | 17 | 9 |
| 737: | 9 | 11 | 10 | 6 | 4 | 9 | 7 | 8 |
| 745: | 12 | 5 | 11 | 13 | 10 | 11 | 5 | 10 |
| 753: | 8 | 16 | 9 | 6 | 12 | 9 | 10 | 5 |
| 761: | 8 | 9 | 19 | 7 | 13 | 12 | 9 | 21 |
| 769: | 16 | 8 | 12 | 15 | 10 | 8 | 5 | 13 |
| 777: | 6 | 9 | 9 | 13 | 11 | 12 | 6 | 18 |
| 785: | 11 | 11 | 12 | 7 | 9 | 8 | 8 | 10 |
| 793: | 7 | 16 | 29 | 13 | 6 | 5 | 6 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 10 | 9 | 9 | 7 | 9 | 10 | 15 | 8 |

Sample Title: HTC-A03-S002-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 2 | 12 | 9 | 9 | 6 | 4 | 4 | 2 |
| 817: | 9 | 3 | 4 | 6 | 6 | 7 | 8 | 5 |
| 825: | 7 | 13 | 4 | 4 | 10 | 7 | 13 | 3 |
| 833: | 11 | 11 | 13 | 8 | 6 | 13 | 11 | 10 |
| 841: | 9 | 13 | 9 | 9 | 4 | 8 | 10 | 4 |
| 849: | 10 | 9 | 4 | 2 | 6 | 3 | 4 | 10 |
| 857: | 2 | 8 | 15 | 20 | 25 | 6 | 7 | 6 |
| 865: | 10 | 7 | 5 | 7 | 3 | 6 | 4 | 10 |
| 873: | 8 | 12 | 5 | 7 | 1 | 8 | 3 | 5 |
| 881: | 10 | 12 | 3 | 8 | 9 | 8 | 10 | 9 |
| 889: | 10 | 8 | 3 | 10 | 3 | 9 | 6 | 8 |
| 897: | 3 | 10 | 9 | 5 | 6 | 3 | 5 | 7 |
| 905: | 3 | 8 | 6 | 5 | 11 | 55 | 70 | 39 |
| 913: | 7 | 7 | 6 | 7 | 4 | 3 | 2 | 2 |
| 921: | 5 | 5 | 3 | 8 | 5 | 6 | 4 | 8 |
| 929: | 5 | 6 | 7 | 8 | 5 | 11 | 2 | 3 |
| 937: | 5 | 9 | 4 | 5 | 5 | 5 | 3 | 10 |
| 945: | 8 | 8 | 7 | 8 | 7 | 5 | 7 | 7 |
| 953: | 4 | 11 | 6 | 6 | 6 | 4 | 10 | 5 |
| 961: | 8 | 5 | 9 | 19 | 24 | 7 | 15 | 36 |
| 969: | 49 | 20 | 10 | 3 | 9 | 7 | 7 | 7 |
| 977: | 8 | 8 | 4 | 9 | 2 | 13 | 6 | 6 |
| 985: | 5 | 6 | 7 | 2 | 11 | 3 | 7 | 9 |
| 993: | 4 | 5 | 6 | 9 | 6 | 9 | 7 | 8 |
| 1001: | 9 | 8 | 11 | 3 | 9 | 7 | 5 | 4 |
| 1009: | 5 | 2 | 6 | 13 | 5 | 9 | 7 | 6 |
| 1017: | 6 | 5 | 11 | 8 | 4 | 8 | 6 | 5 |
| 1025: | 6 | 7 | 4 | 6 | 7 | 4 | 5 | 6 |
| 1033: | 11 | 10 | 5 | 3 | 10 | 8 | 8 | 3 |
| 1041: | 3 | 6 | 8 | 5 | 14 | 7 | 7 | 5 |
| 1049: | 7 | 3 | 5 | 7 | 3 | 13 | 7 | 4 |
| 1057: | 5 | 7 | 3 | 8 | 6 | 7 | 6 | 4 |
| 1065: | 8 | 11 | 7 | 4 | 3 | 2 | 6 | 9 |
| 1073: | 6 | 8 | 5 | 13 | 6 | 6 | 6 | 10 |
| 1081: | 9 | 8 | 8 | 7 | 11 | 7 | 5 | 7 |
| 1089: | 3 | 3 | 10 | 4 | 9 | 7 | 5 | 7 |
| 1097: | 7 | 5 | 4 | 7 | 6 | 5 | 5 | 12 |
| 1105: | 3 | 4 | 2 | 9 | 8 | 17 | 15 | 7 |
| 1113: | 5 | 9 | 10 | 7 | 6 | 14 | 24 | 33 |
| 1121: | 21 | 9 | 4 | 7 | 3 | 11 | 11 | 10 |
| 1129: | 11 | 7 | 7 | 8 | 13 | 7 | 5 | 7 |
| 1137: | 11 | 6 | 2 | 9 | 3 | 4 | 14 | 4 |
| 1145: | 5 | 11 | 7 | 6 | 6 | 5 | 5 | 8 |
| 1153: | 4 | 6 | 11 | 13 | 8 | 3 | 6 | 8 |
| 1161: | 5 | 7 | 10 | 6 | 8 | 4 | 8 | 4 |
| 1169: | 10 | 7 | 9 | 2 | 8 | 9 | 15 | 6 |
| 1177: | 10 | 5 | 9 | 8 | 10 | 5 | 8 | 9 |
| 1185: | 8 | 8 | 1 | 6 | 8 | 7 | 4 | 8 |
| 1193: | 3 | 11 | 8 | 9 | 5 | 5 | 8 | 10 |
| 1201: | 10 | 6 | 11 | 6 | 5 | 9 | 7 | 6 |
| 1209: | 9 | 6 | 7 | 13 | 6 | 6 | 11 | 7 |
| 1217: | 5 | 9 | 5 | 11 | 10 | 9 | 4 | 7 |
| 1225: | 9 | 10 | 13 | 7 | 6 | 8 | 8 | 11 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 3 | 5 | 11 | 7 | 11 | 13 | 14 | 17 |

Sample Title: HTC-A03-S002-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 7 | 4 | 7 | 10 | 8 | 3 | 9 | 6 |
| 1249: | 8 | 6 | 7 | 11 | 9 | 10 | 6 | 4 |
| 1257: | 7 | 7 | 7 | 5 | 9 | 4 | 8 | 6 |
| 1265: | 4 | 6 | 9 | 8 | 4 | 7 | 2 | 5 |
| 1273: | 4 | 6 | 5 | 5 | 3 | 6 | 7 | 8 |
| 1281: | 7 | 5 | 3 | 3 | 2 | 5 | 7 | 6 |
| 1289: | 7 | 5 | 5 | 10 | 10 | 9 | 4 | 3 |
| 1297: | 5 | 6 | 7 | 1 | 7 | 5 | 4 | 4 |
| 1305: | 5 | 3 | 6 | 5 | 7 | 3 | 2 | 9 |
| 1313: | 2 | 5 | 8 | 5 | 1 | 5 | 5 | 2 |
| 1321: | 5 | 3 | 3 | 4 | 6 | 3 | 3 | 2 |
| 1329: | 0 | 3 | 5 | 3 | 5 | 5 | 5 | 4 |
| 1337: | 2 | 7 | 4 | 1 | 2 | 3 | 2 | 3 |
| 1345: | 2 | 1 | 4 | 5 | 2 | 2 | 2 | 4 |
| 1353: | 5 | 3 | 4 | 1 | 2 | 5 | 4 | 1 |
| 1361: | 3 | 1 | 3 | 5 | 3 | 2 | 1 | 2 |
| 1369: | 1 | 1 | 2 | 2 | 1 | 1 | 4 | 8 |
| 1377: | 5 | 6 | 2 | 4 | 0 | 2 | 1 | 2 |
| 1385: | 3 | 4 | 4 | 3 | 5 | 4 | 2 | 3 |
| 1393: | 2 | 3 | 1 | 3 | 5 | 2 | 6 | 4 |
| 1401: | 3 | 2 | 4 | 2 | 4 | 2 | 9 | 6 |
| 1409: | 3 | 1 | 2 | 2 | 5 | 2 | 2 | 2 |
| 1417: | 5 | 4 | 1 | 3 | 1 | 1 | 2 | 2 |
| 1425: | 2 | 3 | 0 | 2 | 4 | 5 | 3 | 2 |
| 1433: | 5 | 1 | 4 | 1 | 3 | 3 | 2 | 2 |
| 1441: | 1 | 4 | 3 | 2 | 2 | 2 | 3 | 2 |
| 1449: | 2 | 1 | 2 | 2 | 2 | 4 | 4 | 4 |
| 1457: | 17 | 35 | 139 | 271 | 221 | 73 | 6 | 1 |
| 1465: | 3 | 1 | 1 | 2 | 2 | 1 | 2 | 3 |
| 1473: | 0 | 1 | 1 | 0 | 3 | 5 | 2 | 3 |
| 1481: | 1 | 1 | 3 | 2 | 5 | 2 | 1 | 1 |
| 1489: | 1 | 0 | 0 | 4 | 2 | 2 | 3 | 1 |
| 1497: | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 2 |
| 1505: | 1 | 2 | 2 | 4 | 3 | 3 | 1 | 0 |
| 1513: | 4 | 0 | 1 | 2 | 4 | 1 | 4 | 2 |
| 1521: | 2 | 2 | 0 | 5 | 0 | 1 | 2 | 5 |
| 1529: | 0 | 2 | 1 | 4 | 0 | 1 | 1 | 5 |
| 1537: | 1 | 0 | 0 | 3 | 0 | 1 | 2 | 1 |
| 1545: | 3 | 2 | 4 | 0 | 1 | 0 | 1 | 0 |
| 1553: | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 0 |
| 1561: | 1 | 2 | 1 | 0 | 3 | 2 | 1 | 2 |
| 1569: | 0 | 3 | 2 | 1 | 2 | 1 | 0 | 4 |
| 1577: | 1 | 2 | 3 | 2 | 5 | 3 | 2 | 1 |
| 1585: | 2 | 2 | 3 | 8 | 3 | 2 | 4 | 3 |
| 1593: | 3 | 0 | 3 | 2 | 3 | 2 | 4 | 1 |
| 1601: | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 0 |
| 1609: | 1 | 1 | 3 | 2 | 2 | 1 | 0 | 2 |
| 1617: | 2 | 4 | 5 | 5 | 3 | 1 | 1 | 3 |
| 1625: | 1 | 1 | 0 | 0 | 1 | 3 | 1 | 2 |
| 1633: | 1 | 0 | 0 | 0 | 3 | 4 | 2 | 0 |
| 1641: | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 3 |
| 1649: | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 |
| 1657: | 2 | 0 | 2 | 2 | 3 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 1 | 2 | 1 | 0 | 2 | 3 | 1 | 2 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 2 | 1 | 1 | 4 | 1 | 1 | 2 | 1 |
| 1681: | 0 | 0 | 2 | 3 | 3 | 0 | 2 | 0 |
| 1689: | 0 | 1 | 6 | 1 | 0 | 0 | 1 | 0 |
| 1697: | 2 | 0 | 1 | 0 | 1 | 1 | 3 | 1 |
| 1705: | 0 | 3 | 0 | 2 | 1 | 1 | 1 | 1 |
| 1713: | 0 | 1 | 1 | 4 | 1 | 1 | 2 | 1 |
| 1721: | 2 | 1 | 0 | 1 | 0 | 0 | 4 | 4 |
| 1729: | 12 | 2 | 3 | 1 | 0 | 0 | 1 | 0 |
| 1737: | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 2 |
| 1745: | 0 | 0 | 1 | 1 | 2 | 2 | 1 | 1 |
| 1753: | 1 | 2 | 0 | 2 | 4 | 1 | 2 | 2 |
| 1761: | 7 | 6 | 15 | 22 | 9 | 3 | 3 | 3 |
| 1769: | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 1 |
| 1777: | 3 | 1 | 4 | 1 | 0 | 2 | 1 | 0 |
| 1785: | 0 | 3 | 1 | 1 | 0 | 0 | 2 | 1 |
| 1793: | 1 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| 1801: | 1 | 1 | 3 | 0 | 2 | 3 | 1 | 2 |
| 1809: | 2 | 0 | 0 | 2 | 1 | 1 | 1 | 0 |
| 1817: | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 2 |
| 1825: | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 2 |
| 1833: | 1 | 0 | 1 | 2 | 2 | 1 | 2 | 1 |
| 1841: | 2 | 1 | 1 | 0 | 0 | 3 | 4 | 4 |
| 1849: | 2 | 1 | 0 | 1 | 0 | 2 | 0 | 1 |
| 1857: | 1 | 4 | 1 | 0 | 2 | 0 | 0 | 1 |
| 1865: | 0 | 1 | 0 | 0 | 1 | 2 | 2 | 1 |
| 1873: | 1 | 3 | 1 | 0 | 4 | 0 | 1 | 2 |
| 1881: | 1 | 2 | 0 | 1 | 1 | 3 | 1 | 1 |
| 1889: | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 1897: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| 1905: | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 0 |
| 1913: | 0 | 0 | 2 | 2 | 2 | 3 | 2 | 0 |
| 1921: | 2 | 1 | 1 | 4 | 2 | 0 | 1 | 2 |
| 1929: | 0 | 1 | 1 | 0 | 1 | 2 | 2 | 4 |
| 1937: | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 0 |
| 1945: | 0 | 3 | 2 | 3 | 3 | 0 | 1 | 0 |
| 1953: | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 2 |
| 1961: | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 0 |
| 1969: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1977: | 0 | 3 | 2 | 1 | 1 | 1 | 0 | 1 |
| 1985: | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 0 |
| 1993: | 1 | 1 | 0 | 3 | 1 | 0 | 0 | 1 |
| 2001: | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2009: | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 2017: | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 2 |
| 2025: | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 |
| 2033: | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 |
| 2041: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| 2049: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 2057: | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 |
| 2065: | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 3 |
| 2073: | 1 | 2 | 0 | 0 | 2 | 3 | 2 | 1 |
| 2081: | 2 | 1 | 0 | 0 | 1 | 0 | 2 | 3 |
| 2089: | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 1 | 4 | 1 | 1 | 2 | 2 | 6 | 1 |

Sample Title: HTC-A03-S002-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 0 | 1 | 2 | 1 | 1 | 0 | 2 | 0 |
| 2113: | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 2 |
| 2121: | 0 | 3 | 1 | 1 | 0 | 0 | 1 | 1 |
| 2129: | 0 | 2 | 0 | 1 | 2 | 0 | 0 | 1 |
| 2137: | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 2145: | 1 | 1 | 0 | 0 | 3 | 1 | 1 | 0 |
| 2153: | 2 | 1 | 1 | 0 | 2 | 0 | 1 | 1 |
| 2161: | 0 | 1 | 1 | 2 | 1 | 0 | 1 | 1 |
| 2169: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2177: | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| 2185: | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 1 |
| 2193: | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 0 |
| 2201: | 1 | 2 | 5 | 5 | 3 | 0 | 1 | 1 |
| 2209: | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 0 |
| 2217: | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 1 |
| 2225: | 0 | 2 | 1 | 1 | 1 | 1 | 0 | 1 |
| 2233: | 0 | 0 | 1 | 2 | 0 | 1 | 1 | 0 |
| 2241: | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 1 |
| 2249: | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 1 |
| 2257: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2265: | 3 | 0 | 0 | 2 | 0 | 2 | 0 | 2 |
| 2273: | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 3 |
| 2281: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2289: | 4 | 2 | 3 | 3 | 1 | 1 | 2 | 0 |
| 2297: | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2305: | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2313: | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 1 |
| 2321: | 2 | 2 | 1 | 0 | 0 | 1 | 2 | 3 |
| 2329: | 1 | 0 | 0 | 3 | 0 | 1 | 4 | 3 |
| 2337: | 2 | 1 | 2 | 2 | 0 | 0 | 1 | 2 |
| 2345: | 2 | 1 | 3 | 0 | 2 | 4 | 0 | 0 |
| 2353: | 0 | 0 | 0 | 1 | 2 | 3 | 0 | 3 |
| 2361: | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 2369: | 2 | 2 | 1 | 1 | 1 | 2 | 0 | 0 |
| 2377: | 0 | 0 | 2 | 1 | 0 | 0 | 3 | 0 |
| 2385: | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 0 |
| 2393: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2401: | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 2 |
| 2409: | 2 | 1 | 1 | 2 | 0 | 2 | 1 | 0 |
| 2417: | 0 | 3 | 1 | 1 | 2 | 1 | 1 | 1 |
| 2425: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2433: | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 2 |
| 2441: | 0 | 2 | 0 | 1 | 1 | 1 | 4 | 0 |
| 2449: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 2 |
| 2457: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2465: | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 2473: | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 2481: | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 |
| 2489: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2497: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2505: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2513: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2545: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2553: | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2561: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2569: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2577: | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2585: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2593: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2601: | 1 | 0 | 0 | 0 | 1 | 2 | 1 | 2 |
| 2609: | 2 | 5 | 2 | 17 | 32 | 22 | 7 | 2 |
| 2617: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2625: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2633: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2649: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2665: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 2673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2689: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2697: | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2705: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2721: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2729: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2737: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2745: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2753: | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 |
| 2761: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2777: | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 |
| 2785: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2793: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2809: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2825: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2833: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2873: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 2881: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2889: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2897: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2905: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2913: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2921: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2929: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 2937: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2953: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2993: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3009: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3017: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3081: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3089: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3137: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3177: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3185: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3193: | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 1 |
| 3201: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3209: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3217: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3233: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3241: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3257: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3297: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3321: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3337: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3345: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3361: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3385: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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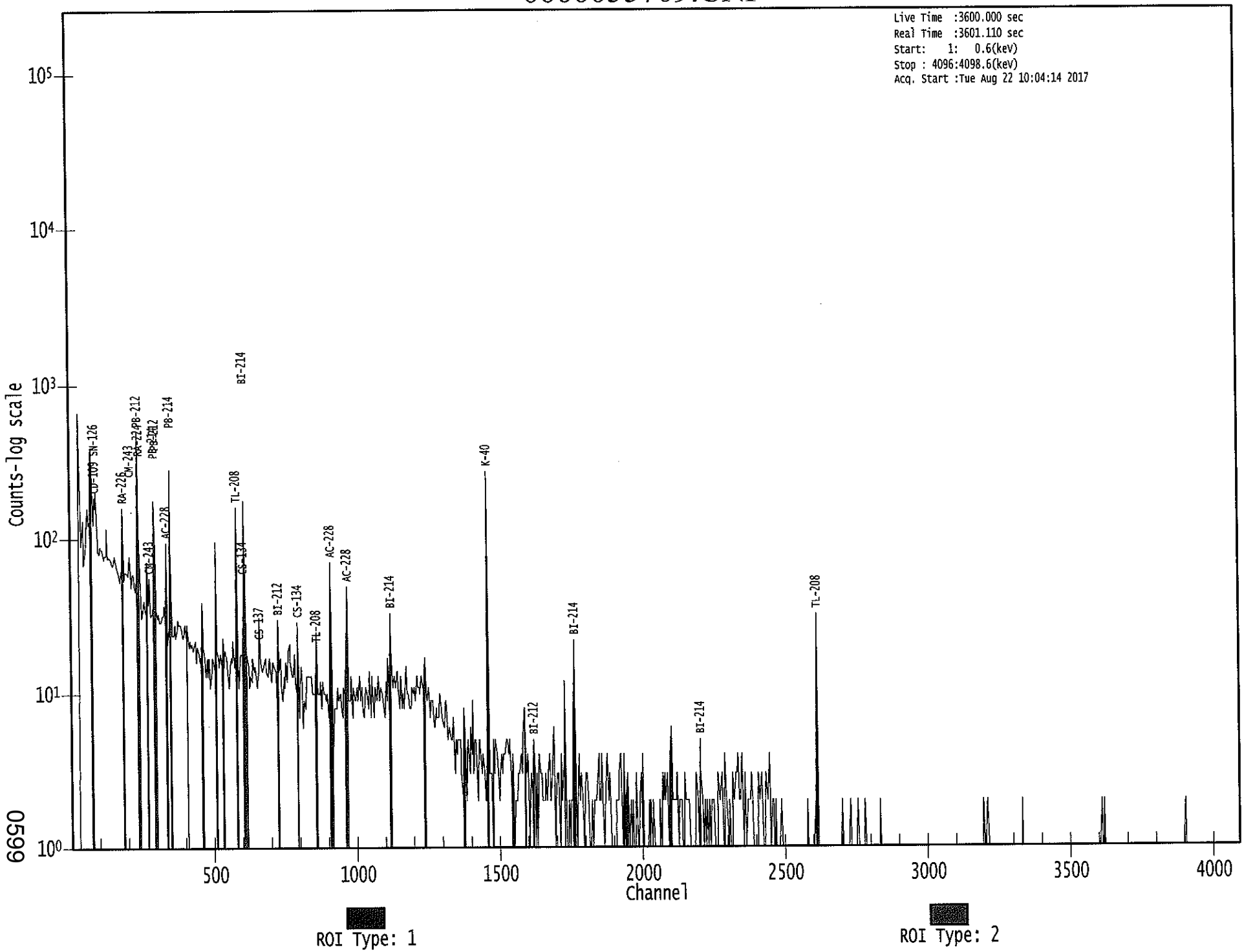
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3409: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3417: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3449: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3505: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3513: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3545: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 3569: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3593: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3705: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3729: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3753: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3785: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 3809: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3841: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3865: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3897: | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3945: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4089: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

# 0000055709.CNF




0699

8/22

Apex-Gamma

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-08 |
| Sample Description | : HTC-A03-S002-2430-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.255E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:43:28AM |
| Acquisition Started | : 8/22/2017 10:04:23AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE3 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3608.4 seconds |
| Dead Time | : 0.23 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 9 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55710 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 11:05:16AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 24.91 | 25.23 | 0.0000 | 0.00 |
| 2 | 63.57 | 63.88 | 0.0000 | 0.00 |
| 3 | 75.06 | 75.36 | 0.0000 | 0.00 |
| 4 | 77.55 | 77.85 | 0.0000 | 0.00 |
| 5 | 87.74 | 88.04 | 0.0000 | 0.00 |
| 6 | 93.33 | 93.63 | 0.0000 | 0.00 |
| 7 | 186.27 | 186.54 | 0.0000 | 0.00 |
| 8 | 239.03 | 239.28 | 0.0000 | 0.00 |
| 9 | 242.40 | 242.64 | 0.0000 | 0.00 |
| 10 | 270.11 | 270.34 | 0.0000 | 0.00 |
| 11 | 277.38 | 277.61 | 0.0000 | 0.00 |
| 12 | 295.47 | 295.69 | 0.0000 | 0.00 |
| 13 | 328.92 | 329.14 | 0.0000 | 0.00 |
| 14 | 338.39 | 338.60 | 0.0000 | 0.00 |
| 15 | 352.34 | 352.55 | 0.0000 | 0.00 |
| 16 | 456.58 | 456.75 | 0.0000 | 0.00 |
| 17 | 463.32 | 463.49 | 0.0000 | 0.00 |
| 18 | 511.88 | 512.03 | 0.0000 | 0.00 |
| 19 | 583.55 | 583.68 | 0.0000 | 0.00 |
| 20 | 609.46 | 609.58 | 0.0000 | 0.00 |
| 21 | 662.70 | 662.81 | 0.0000 | 0.00 |
| 22 | 707.78 | 707.87 | 0.0000 | 0.00 |
| 23 | 727.88 | 727.96 | 0.0000 | 0.00 |
| 24 | 755.08 | 755.16 | 0.0000 | 0.00 |
| 25 | 785.07 | 785.14 | 0.0000 | 0.00 |
| 26 | 794.32 | 794.38 | 0.0000 | 0.00 |
| 27 | 859.78 | 859.82 | 0.0000 | 0.00 |
| 28 | 911.09 | 911.11 | 0.0000 | 0.00 |
| 29 | 964.71 | 964.71 | 0.0000 | 0.00 |
| 30 | 968.66 | 968.66 | 0.0000 | 0.00 |
| 31 | 981.95 | 981.94 | 0.0000 | 0.00 |
| 32 | 1120.44 | 1120.39 | 0.0000 | 0.00 |
| 33 | 1274.17 | 1274.07 | 0.0000 | 0.00 |
| 34 | 1299.73 | 1299.61 | 0.0000 | 0.00 |
| 35 | 1306.30 | 1306.18 | 0.0000 | 0.00 |
| 36 | 1357.47 | 1357.34 | 0.0000 | 0.00 |
| 37 | 1377.48 | 1377.34 | 0.0000 | 0.00 |
| 38 | 1460.73 | 1460.57 | 0.0000 | 0.00 |
| 39 | 1507.65 | 1507.47 | 0.0000 | 0.00 |
| 40 | 1535.19 | 1535.00 | 0.0000 | 0.00 |
| 41 | 1579.89 | 1579.69 | 0.0000 | 0.00 |
| 42 | 1591.04 | 1590.83 | 0.0000 | 0.00 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1629.89 | 1629.67 | 0.0000 | 0.00 |
| 44 | 1658.73 | 1658.50 | 0.0000 | 0.00 |
| 45 | 1729.51 | 1729.25 | 0.0000 | 0.00 |
| 46 | 1764.34 | 1764.08 | 0.0000 | 0.00 |
| 47 | 1767.44 | 1767.17 | 0.0000 | 0.00 |
| 48 | 1847.70 | 1847.41 | 0.0000 | 0.00 |
| 49 | 1889.33 | 1889.02 | 0.0000 | 0.00 |
| 50 | 1907.82 | 1907.50 | 0.0000 | 0.00 |
| 51 | 1957.86 | 1957.53 | 0.0000 | 0.00 |
| 52 | 2103.01 | 2102.63 | 0.0000 | 0.00 |
| 53 | 2118.30 | 2117.91 | 0.0000 | 0.00 |
| 54 | 2203.47 | 2203.05 | 0.0000 | 0.00 |
| 55 | 2448.93 | 2448.43 | 0.0000 | 0.00 |
| 56 | 2467.51 | 2467.00 | 0.0000 | 0.00 |
| 57 | 2566.14 | 2565.60 | 0.0000 | 0.00 |
| 58 | 2614.48 | 2613.93 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 11:05:16AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 24.91 | 22 - | 29 | 25.23 | 7.84E+01 | 91.13 | 1.34E+03 | 5.18 |
| | 2 | 63.57 | 60 - | 67 | 63.88 | 1.79E+02 | 118.30 | 2.22E+03 | 2.44 |
| M | 3 | 75.06 | 71 - | 82 | 75.36 | 4.28E+02 | 119.02 | 1.87E+03 | 2.21 |
| m | 4 | 77.55 | 71 - | 82 | 77.85 | 7.02E+02 | 118.55 | 1.70E+03 | 2.22 |
| | 5 | 87.74 | 86 - | 90 | 88.04 | 1.10E+02 | 83.53 | 1.45E+03 | 1.42 |
| | 6 | 93.33 | 91 - | 97 | 93.63 | 2.58E+02 | 99.67 | 1.57E+03 | 2.11 |
| | 7 | 186.27 | 183 - | 189 | 186.54 | 1.64E+02 | 75.70 | 9.20E+02 | 2.31 |
| M | 8 | 239.03 | 234 - | 247 | 239.28 | 7.09E+02 | 74.89 | 4.81E+02 | 2.06 |
| m | 9 | 242.40 | 234 - | 247 | 242.64 | 1.82E+02 | 66.19 | 4.41E+02 | 2.06 |
| | 10 | 270.11 | 266 - | 274 | 270.34 | 9.70E+01 | 65.68 | 5.96E+02 | 1.82 |
| | 11 | 277.38 | 275 - | 282 | 277.61 | 4.48E+01 | 56.04 | 4.96E+02 | 1.41 |
| | 12 | 295.47 | 292 - | 298 | 295.69 | 3.33E+02 | 60.05 | 4.13E+02 | 1.99 |
| | 13 | 328.92 | 323 - | 333 | 329.14 | 9.07E+01 | 66.37 | 5.39E+02 | 5.91 |
| | 14 | 338.39 | 335 - | 341 | 338.60 | 1.15E+02 | 49.98 | 3.71E+02 | 1.66 |
| | 15 | 352.34 | 346 - | 359 | 352.55 | 5.54E+02 | 86.11 | 5.66E+02 | 2.24 |
| | 16 | 456.58 | 455 - | 459 | 456.75 | 2.92E+01 | 27.35 | 1.38E+02 | 3.09 |
| | 17 | 463.32 | 460 - | 467 | 463.49 | 7.43E+01 | 38.37 | 1.95E+02 | 2.09 |
| | 18 | 511.88 | 507 - | 520 | 512.03 | 1.44E+02 | 61.60 | 3.60E+02 | 3.10 |
| | 19 | 583.55 | 580 - | 590 | 583.68 | 1.72E+02 | 49.18 | 2.31E+02 | 2.46 |
| | 20 | 609.46 | 606 - | 614 | 609.58 | 3.41E+02 | 51.29 | 1.97E+02 | 2.44 |
| | 21 | 662.70 | 657 - | 668 | 662.81 | 5.69E+01 | 50.68 | 2.88E+02 | 2.14 |
| | 22 | 707.78 | 705 - | 712 | 707.87 | 2.89E+01 | 28.00 | 1.10E+02 | 4.35 |
| | 23 | 727.88 | 725 - | 732 | 727.96 | 4.79E+01 | 31.24 | 1.28E+02 | 2.08 |
| | 24 | 755.08 | 750 - | 759 | 755.16 | 3.42E+01 | 32.28 | 1.28E+02 | 2.64 |
| | 25 | 785.07 | 781 - | 788 | 785.14 | 4.27E+01 | 28.14 | 1.03E+02 | 3.62 |
| | 26 | 794.32 | 790 - | 798 | 794.38 | 3.35E+01 | 31.36 | 1.31E+02 | 1.90 |
| | 27 | 859.78 | 854 - | 865 | 859.82 | 6.21E+01 | 31.81 | 9.37E+01 | 2.58 |
| | 28 | 911.09 | 906 - | 916 | 911.11 | 1.04E+02 | 43.65 | 2.00E+02 | 2.38 |
| M | 29 | 964.71 | 962 - | 978 | 964.71 | 2.45E+01 | 17.50 | 4.84E+01 | 2.85 |
| m | 30 | 968.66 | 962 - | 978 | 968.66 | 9.55E+01 | 27.93 | 6.14E+01 | 2.40 |
| | 31 | 981.95 | 979 - | 985 | 981.94 | 2.14E+01 | 19.90 | 5.71E+01 | 3.59 |
| | 32 | 1120.44 | 1116 - | 1124 | 1120.39 | 4.30E+01 | 33.29 | 1.44E+02 | 1.99 |
| | 33 | 1274.17 | 1266 - | 1282 | 1274.07 | 4.96E+01 | 39.19 | 1.27E+02 | 10.99 |
| | 34 | 1299.73 | 1297 - | 1302 | 1299.61 | 1.48E+01 | 13.89 | 2.65E+01 | 1.54 |
| | 35 | 1306.30 | 1303 - | 1310 | 1306.18 | 1.74E+01 | 15.36 | 2.72E+01 | 3.63 |
| | 36 | 1357.47 | 1355 - | 1360 | 1357.34 | 8.81E+00 | 10.44 | 1.44E+01 | 2.89 |
| | 37 | 1377.48 | 1373 - | 1381 | 1377.34 | 2.08E+01 | 17.83 | 3.65E+01 | 3.23 |
| | 38 | 1460.73 | 1453 - | 1467 | 1460.57 | 6.20E+02 | 55.88 | 6.74E+01 | 2.67 |
| | 39 | 1507.65 | 1504 - | 1510 | 1507.47 | 1.44E+01 | 12.38 | 1.73E+01 | 1.79 |
| | 40 | 1535.19 | 1530 - | 1540 | 1535.00 | 1.40E+01 | 14.87 | 2.20E+01 | 3.67 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 41 | 1579.89 | 1575 - | 1582 | 1579.69 | 1.21E+01 | 12.00 | 1.59E+01 | 2.17 |
| | 42 | 1591.04 | 1584 - | 1599 | 1590.83 | 4.97E+01 | 16.61 | 6.70E+00 | 7.92 |
| | 43 | 1629.89 | 1626 - | 1634 | 1629.67 | 1.47E+01 | 10.61 | 6.67E+00 | 5.38 |
| | 44 | 1658.73 | 1656 - | 1661 | 1658.50 | 5.67E+00 | 7.35 | 6.67E+00 | 2.46 |
| | 45 | 1729.51 | 1725 - | 1732 | 1729.25 | 1.11E+01 | 11.66 | 1.38E+01 | 1.37 |
| M | 46 | 1764.34 | 1759 - | 1769 | 1764.08 | 4.76E+01 | 18.14 | 1.73E+01 | 2.92 |
| m | 47 | 1767.44 | 1759 - | 1769 | 1767.17 | 1.32E+01 | 11.18 | 5.71E+00 | 2.96 |
| | 48 | 1847.70 | 1842 - | 1851 | 1847.41 | 1.45E+01 | 12.77 | 1.50E+01 | 2.45 |
| | 49 | 1889.33 | 1884 - | 1892 | 1889.02 | 1.16E+01 | 8.73 | 4.79E+00 | 1.62 |
| | 50 | 1907.82 | 1905 - | 1910 | 1907.50 | 8.00E+00 | 5.66 | 0.00E+00 | 1.33 |
| | 51 | 1957.86 | 1954 - | 1961 | 1957.53 | 7.85E+00 | 7.48 | 4.30E+00 | 3.90 |
| | 52 | 2103.01 | 2099 - | 2106 | 2102.63 | 1.60E+01 | 8.00 | 0.00E+00 | 4.00 |
| | 53 | 2118.30 | 2113 - | 2120 | 2117.91 | 1.06E+01 | 9.59 | 8.80E+00 | 2.15 |
| | 54 | 2203.47 | 2197 - | 2207 | 2203.05 | 1.63E+01 | 16.35 | 2.55E+01 | 1.48 |
| | 55 | 2448.93 | 2445 - | 2452 | 2448.43 | 1.53E+01 | 9.17 | 3.35E+00 | 5.43 |
| | 56 | 2467.51 | 2464 - | 2469 | 2467.00 | 5.00E+00 | 4.47 | 0.00E+00 | 1.50 |
| | 57 | 2566.14 | 2562 - | 2568 | 2565.60 | 5.00E+00 | 4.47 | 0.00E+00 | 1.24 |
| | 58 | 2614.48 | 2608 - | 2618 | 2613.93 | 6.53E+01 | 18.56 | 1.13E+01 | 2.92 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 11:05:16AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24.91 | 22 - | 29 | 7.84E+01 | 91.13 | 1.34E+03 | 7.35E+01 |
| | 2 | 63.57 | 60 - | 67 | 1.79E+02 | 118.30 | 2.22E+03 | 9.47E+01 |
| M | 3 | 75.06 | 71 - | 82 | 4.28E+02 | 119.02 | 1.87E+03 | 7.10E+01 |
| m | 4 | 77.55 | 71 - | 82 | 7.02E+02 | 118.55 | 1.70E+03 | 6.78E+01 |
| | 5 | 87.74 | 86 - | 90 | 1.10E+02 | 83.53 | 1.45E+03 | 6.65E+01 |
| | 6 | 93.33 | 91 - | 97 | 2.58E+02 | 99.67 | 1.57E+03 | 7.76E+01 |
| | 7 | 186.27 | 183 - | 189 | 1.64E+02 | 75.70 | 9.20E+02 | 5.85E+01 |
| M | 8 | 239.03 | 234 - | 247 | 7.09E+02 | 74.89 | 4.81E+02 | 3.61E+01 |
| m | 9 | 242.40 | 234 - | 247 | 1.82E+02 | 66.19 | 4.41E+02 | 3.45E+01 |
| | 10 | 270.11 | 266 - | 274 | 9.70E+01 | 65.68 | 5.96E+02 | 5.15E+01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 11 | 277.38 | 275 - | 282 | 4.48E+01 | 56.04 | 4.96E+02 | 4.47E+01 |
| | 12 | 295.47 | 292 - | 298 | 3.33E+02 | 60.05 | 4.13E+02 | 3.92E+01 |
| | 13 | 328.92 | 323 - | 333 | 9.07E+01 | 66.37 | 5.39E+02 | 5.23E+01 |
| | 14 | 338.39 | 335 - | 341 | 1.15E+02 | 49.98 | 3.71E+02 | 3.71E+01 |
| | 15 | 352.34 | 346 - | 359 | 5.54E+02 | 86.11 | 5.66E+02 | 5.93E+01 |
| | 16 | 456.58 | 455 - | 459 | 2.92E+01 | 27.35 | 1.38E+02 | 2.07E+01 |
| | 17 | 463.32 | 460 - | 467 | 7.43E+01 | 38.37 | 1.95E+02 | 2.82E+01 |
| | 18 | 511.88 | 507 - | 520 | 1.44E+02 | 61.60 | 3.60E+02 | 4.66E+01 |
| | 19 | 583.55 | 580 - | 590 | 1.72E+02 | 49.18 | 2.31E+02 | 3.42E+01 |
| | 20 | 609.46 | 606 - | 614 | 3.41E+02 | 51.29 | 1.97E+02 | 2.92E+01 |
| | 21 | 662.70 | 657 - | 668 | 5.69E+01 | 50.68 | 2.88E+02 | 3.98E+01 |
| | 22 | 707.78 | 705 - | 712 | 2.89E+01 | 28.00 | 1.10E+02 | 2.13E+01 |
| | 23 | 727.88 | 725 - | 732 | 4.79E+01 | 31.24 | 1.28E+02 | 2.30E+01 |
| | 24 | 755.08 | 750 - | 759 | 3.42E+01 | 32.28 | 1.28E+02 | 2.47E+01 |
| | 25 | 785.07 | 781 - | 788 | 4.27E+01 | 28.14 | 1.03E+02 | 2.05E+01 |
| | 26 | 794.32 | 790 - | 798 | 3.35E+01 | 31.36 | 1.31E+02 | 2.40E+01 |
| | 27 | 859.78 | 854 - | 865 | 6.21E+01 | 31.81 | 9.37E+01 | 2.27E+01 |
| | 28 | 911.09 | 906 - | 916 | 1.04E+02 | 43.65 | 2.00E+02 | 3.17E+01 |
| M | 29 | 964.71 | 962 - | 978 | 2.45E+01 | 17.50 | 4.84E+01 | 1.14E+01 |
| m | 30 | 968.66 | 962 - | 978 | 9.55E+01 | 27.93 | 6.14E+01 | 1.29E+01 |
| | 31 | 981.95 | 979 - | 985 | 2.14E+01 | 19.90 | 5.71E+01 | 1.45E+01 |
| | 32 | 1120.44 | 1116 - | 1124 | 4.30E+01 | 33.29 | 1.44E+02 | 2.51E+01 |
| | 33 | 1274.17 | 1266 - | 1282 | 4.96E+01 | 39.19 | 1.27E+02 | 3.01E+01 |
| | 34 | 1299.73 | 1297 - | 1302 | 1.48E+01 | 13.89 | 2.65E+01 | 9.52E+00 |
| | 35 | 1306.30 | 1303 - | 1310 | 1.74E+01 | 15.36 | 2.72E+01 | 1.06E+01 |
| | 36 | 1357.47 | 1355 - | 1360 | 8.81E+00 | 10.44 | 1.44E+01 | 7.06E+00 |
| | 37 | 1377.48 | 1373 - | 1381 | 2.08E+01 | 17.83 | 3.65E+01 | 1.26E+01 |
| | 38 | 1460.73 | 1453 - | 1467 | 6.20E+02 | 55.88 | 6.74E+01 | 2.08E+01 |
| | 39 | 1507.65 | 1504 - | 1510 | 1.44E+01 | 12.38 | 1.73E+01 | 8.04E+00 |
| | 40 | 1535.19 | 1530 - | 1540 | 1.40E+01 | 14.87 | 2.20E+01 | 1.06E+01 |
| | 41 | 1579.89 | 1575 - | 1582 | 1.21E+01 | 12.00 | 1.59E+01 | 8.05E+00 |
| | 42 | 1591.04 | 1584 - | 1599 | 4.97E+01 | 16.61 | 6.70E+00 | 7.23E+00 |
| | 43 | 1629.89 | 1626 - | 1634 | 1.47E+01 | 10.61 | 6.67E+00 | 6.03E+00 |
| | 44 | 1658.73 | 1656 - | 1661 | 5.67E+00 | 7.35 | 6.67E+00 | 4.60E+00 |
| | 45 | 1729.51 | 1725 - | 1732 | 1.11E+01 | 11.66 | 1.38E+01 | 7.87E+00 |
| M | 46 | 1764.34 | 1759 - | 1769 | 4.76E+01 | 18.14 | 1.73E+01 | 6.84E+00 |
| m | 47 | 1767.44 | 1759 - | 1769 | 1.32E+01 | 11.18 | 5.71E+00 | 3.93E+00 |
| | 48 | 1847.70 | 1842 - | 1851 | 1.45E+01 | 12.77 | 1.50E+01 | 8.42E+00 |
| | 49 | 1889.33 | 1884 - | 1892 | 1.16E+01 | 8.73 | 4.79E+00 | 4.49E+00 |
| | 50 | 1907.82 | 1905 - | 1910 | 8.00E+00 | 5.66 | 0.00E+00 | 0.00E+00 |
| | 51 | 1957.86 | 1954 - | 1961 | 7.85E+00 | 7.48 | 4.30E+00 | 4.08E+00 |
| | 52 | 2103.01 | 2099 - | 2106 | 1.60E+01 | 8.00 | 0.00E+00 | 0.00E+00 |
| | 53 | 2118.30 | 2113 - | 2120 | 1.06E+01 | 9.59 | 8.80E+00 | 5.79E+00 |
| | 54 | 2203.47 | 2197 - | 2207 | 1.63E+01 | 16.35 | 2.55E+01 | 1.17E+01 |
| | 55 | 2448.93 | 2445 - | 2452 | 1.53E+01 | 9.17 | 3.35E+00 | 3.92E+00 |
| | 56 | 2467.51 | 2464 - | 2469 | 5.00E+00 | 4.47 | 0.00E+00 | 0.00E+00 |
| | 57 | 2566.14 | 2562 - | 2568 | 5.00E+00 | 4.47 | 0.00E+00 | 0.00E+00 |
| | 58 | 2614.48 | 2608 - | 2618 | 6.53E+01 | 18.56 | 1.13E+01 | 7.50E+00 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 11:05:16AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 24.91 | 22 - | 29 | 25.23 | 7.84E+01 | 91.13 | 1.34E+03 | TH-231 |
| | 2 | 63.57 | 60 - | 67 | 63.88 | 1.79E+02 | 118.30 | 2.22E+03 | TH-234 |
| | | | | | | | | | TH-230 |
| M | 3 | 75.06 | 71 - | 82 | 75.36 | 4.28E+02 | 119.02 | 1.87E+03 | AM-243 |
| m | 4 | 77.55 | 71 - | 82 | 77.85 | 7.02E+02 | 118.55 | 1.70E+03 | TI-44 |
| | 5 | 87.74 | 86 - | 90 | 88.04 | 1.10E+02 | 83.53 | 1.45E+03 | SN-126 |
| | | | | | | | | | CD-109 |
| | | | | | | | | | LU-176 |
| | 6 | 93.33 | 91 - | 97 | 93.63 | 2.58E+02 | 99.67 | 1.57E+03 | GA-67 |
| | 7 | 186.27 | 183 - | 189 | 186.54 | 1.64E+02 | 75.70 | 9.20E+02 | RA-226 |
| M | 8 | 239.03 | 234 - | 247 | 239.28 | 7.09E+02 | 74.89 | 4.81E+02 | PB-212 |
| m | 9 | 242.40 | 234 - | 247 | 242.64 | 1.82E+02 | 66.19 | 4.41E+02 | ..... |
| | 10 | 270.11 | 266 - | 274 | 270.34 | 9.70E+01 | 65.68 | 5.96E+02 | ..... |
| | 11 | 277.38 | 275 - | 282 | 277.61 | 4.48E+01 | 56.04 | 4.96E+02 | CM-243 |
| | | | | | | | | | NP-239 |
| | 12 | 295.47 | 292 - | 298 | 295.69 | 3.33E+02 | 60.05 | 4.13E+02 | PB-214 |
| | 13 | 328.92 | 323 - | 333 | 329.14 | 9.07E+01 | 66.37 | 5.39E+02 | LA-140 |
| | 14 | 338.39 | 335 - | 341 | 338.60 | 1.15E+02 | 49.98 | 3.71E+02 | AC-228 |
| | 15 | 352.34 | 346 - | 359 | 352.55 | 5.54E+02 | 86.11 | 5.66E+02 | PB-214 |
| | 16 | 456.58 | 455 - | 459 | 456.75 | 2.92E+01 | 27.35 | 1.38E+02 | ..... |
| | 17 | 463.32 | 460 - | 467 | 463.49 | 7.43E+01 | 38.37 | 1.95E+02 | SB-125 |
| | 18 | 511.88 | 507 - | 520 | 512.03 | 1.44E+02 | 61.60 | 3.60E+02 | ..... |
| | 19 | 583.55 | 580 - | 590 | 583.68 | 1.72E+02 | 49.18 | 2.31E+02 | TL-208 |
| | 20 | 609.46 | 606 - | 614 | 609.58 | 3.41E+02 | 51.29 | 1.97E+02 | BI-214 |
| | 21 | 662.70 | 657 - | 668 | 662.81 | 5.69E+01 | 50.68 | 2.88E+02 | ..... |
| | 22 | 707.78 | 705 - | 712 | 707.87 | 2.89E+01 | 28.00 | 1.10E+02 | ..... |
| | 23 | 727.88 | 725 - | 732 | 727.96 | 4.79E+01 | 31.24 | 1.28E+02 | BI-212 |
| | 24 | 755.08 | 750 - | 759 | 755.16 | 3.42E+01 | 32.28 | 1.28E+02 | ..... |
| | 25 | 785.07 | 781 - | 788 | 785.14 | 4.27E+01 | 28.14 | 1.03E+02 | ..... |
| | 26 | 794.32 | 790 - | 798 | 794.38 | 3.35E+01 | 31.36 | 1.31E+02 | ..... |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 27 | 859.78 | 854 - | 865 | 859.82 | 6.21E+01 | 31.81 | 9.37E+01 | TL-208 |
| | 28 | 911.09 | 906 - | 916 | 911.11 | 1.04E+02 | 43.65 | 2.00E+02 | AC-228 |
| | | | | | | | | | TL-204 |
| M | 29 | 964.71 | 962 - | 978 | 964.71 | 2.45E+01 | 17.50 | 4.84E+01 | EU-152 |
| m | 30 | 968.66 | 962 - | 978 | 968.66 | 9.55E+01 | 27.93 | 6.14E+01 | AC-228 |
| | 31 | 981.95 | 979 - | 985 | 981.94 | 2.14E+01 | 19.90 | 5.71E+01 | ..... |
| | 32 | 1120.44 | 1116 - | 1124 | 1120.39 | 4.30E+01 | 33.29 | 1.44E+02 | SC-46 |
| | | | | | | | | | BI-214 |
| | | | | | | | | | TA-182 |
| | 33 | 1274.17 | 1266 - | 1282 | 1274.07 | 4.96E+01 | 39.19 | 1.27E+02 | EU-154 |
| | | | | | | | | | NA-22 |
| | 34 | 1299.73 | 1297 - | 1302 | 1299.61 | 1.48E+01 | 13.89 | 2.65E+01 | ..... |
| | 35 | 1306.30 | 1303 - | 1310 | 1306.18 | 1.74E+01 | 15.36 | 2.72E+01 | ..... |
| | 36 | 1357.47 | 1355 - | 1360 | 1357.34 | 8.81E+00 | 10.44 | 1.44E+01 | ..... |
| | 37 | 1377.48 | 1373 - | 1381 | 1377.34 | 2.08E+01 | 17.83 | 3.65E+01 | ..... |
| | 38 | 1460.73 | 1453 - | 1467 | 1460.57 | 6.20E+02 | 55.88 | 6.74E+01 | K-40 |
| | 39 | 1507.65 | 1504 - | 1510 | 1507.47 | 1.44E+01 | 12.38 | 1.73E+01 | ..... |
| | 40 | 1535.19 | 1530 - | 1540 | 1535.00 | 1.40E+01 | 14.87 | 2.20E+01 | ..... |
| | 41 | 1579.89 | 1575 - | 1582 | 1579.69 | 1.21E+01 | 12.00 | 1.59E+01 | ..... |
| | 42 | 1591.04 | 1584 - | 1599 | 1590.83 | 4.97E+01 | 16.61 | 6.70E+00 | ..... |
| | 43 | 1629.89 | 1626 - | 1634 | 1629.67 | 1.47E+01 | 10.61 | 6.67E+00 | ..... |
| | 44 | 1658.73 | 1656 - | 1661 | 1658.50 | 5.67E+00 | 7.35 | 6.67E+00 | ..... |
| | 45 | 1729.51 | 1725 - | 1732 | 1729.25 | 1.11E+01 | 11.66 | 1.38E+01 | ..... |
| M | 46 | 1764.34 | 1759 - | 1769 | 1764.08 | 4.76E+01 | 18.14 | 1.73E+01 | BI-214 |
| m | 47 | 1767.44 | 1759 - | 1769 | 1767.17 | 1.32E+01 | 11.18 | 5.71E+00 | ..... |
| | 48 | 1847.70 | 1842 - | 1851 | 1847.41 | 1.45E+01 | 12.77 | 1.50E+01 | ..... |
| | 49 | 1889.33 | 1884 - | 1892 | 1889.02 | 1.16E+01 | 8.73 | 4.79E+00 | ..... |
| | 50 | 1907.82 | 1905 - | 1910 | 1907.50 | 8.00E+00 | 5.66 | 0.00E+00 | ..... |
| | 51 | 1957.86 | 1954 - | 1961 | 1957.53 | 7.85E+00 | 7.48 | 4.30E+00 | ..... |
| | 52 | 2103.01 | 2099 - | 2106 | 2102.63 | 1.60E+01 | 8.00 | 0.00E+00 | ..... |
| | 53 | 2118.30 | 2113 - | 2120 | 2117.91 | 1.06E+01 | 9.59 | 8.80E+00 | ..... |
| | 54 | 2203.47 | 2197 - | 2207 | 2203.05 | 1.63E+01 | 16.35 | 2.55E+01 | BI-214 |
| | 55 | 2448.93 | 2445 - | 2452 | 2448.43 | 1.53E+01 | 9.17 | 3.35E+00 | ..... |
| | 56 | 2467.51 | 2464 - | 2469 | 2467.00 | 5.00E+00 | 4.47 | 0.00E+00 | ..... |
| | 57 | 2566.14 | 2562 - | 2568 | 2565.60 | 5.00E+00 | 4.47 | 0.00E+00 | ..... |
| | 58 | 2614.48 | 2608 - | 2618 | 2613.93 | 6.53E+01 | 18.56 | 1.13E+01 | TL-208 |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 11:05:16AM

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 24.91 | 7.84E+01 | 91.13 | 2.60E-03 | 1.73E-03 |
| | 2 | 63.57 | 1.79E+02 | 118.30 | 2.45E-02 | 1.80E-03 |
| M | 3 | 75.06 | 4.28E+02 | 119.02 | 2.65E-02 | 2.02E-03 |
| m | 4 | 77.55 | 7.02E+02 | 118.55 | 2.68E-02 | 2.06E-03 |
| | 5 | 87.74 | 1.10E+02 | 83.53 | 2.72E-02 | 2.25E-03 |
| | 6 | 93.33 | 2.58E+02 | 99.67 | 2.71E-02 | 2.24E-03 |
| | 7 | 186.27 | 1.64E+02 | 75.70 | 1.96E-02 | 1.55E-03 |
| M | 8 | 239.03 | 7.09E+02 | 74.89 | 1.61E-02 | 1.34E-03 |
| m | 9 | 242.40 | 1.82E+02 | 66.19 | 1.59E-02 | 1.32E-03 |
| | 10 | 270.11 | 9.70E+01 | 65.68 | 1.45E-02 | 1.21E-03 |
| | 11 | 277.38 | 4.48E+01 | 56.04 | 1.42E-02 | 1.19E-03 |
| | 12 | 295.47 | 3.33E+02 | 60.05 | 1.35E-02 | 1.15E-03 |
| | 13 | 328.92 | 9.07E+01 | 66.37 | 1.23E-02 | 1.08E-03 |
| | 14 | 338.39 | 1.15E+02 | 49.98 | 1.19E-02 | 1.06E-03 |
| | 15 | 352.34 | 5.54E+02 | 86.11 | 1.15E-02 | 1.03E-03 |
| | 16 | 456.58 | 2.92E+01 | 27.35 | 9.14E-03 | 8.66E-04 |
| | 17 | 463.32 | 7.43E+01 | 38.37 | 9.02E-03 | 8.58E-04 |
| | 18 | 511.88 | 1.44E+02 | 61.60 | 8.24E-03 | 7.93E-04 |
| | 19 | 583.55 | 1.72E+02 | 49.18 | 7.32E-03 | 6.98E-04 |
| | 20 | 609.46 | 3.41E+02 | 51.29 | 7.04E-03 | 6.64E-04 |
| | 21 | 662.70 | 5.69E+01 | 50.68 | 6.53E-03 | 5.94E-04 |
| | 22 | 707.78 | 2.89E+01 | 28.00 | 6.16E-03 | 5.54E-04 |
| | 23 | 727.88 | 4.79E+01 | 31.24 | 6.00E-03 | 5.36E-04 |
| | 24 | 755.08 | 3.42E+01 | 32.28 | 5.81E-03 | 5.12E-04 |
| | 25 | 785.07 | 4.27E+01 | 28.14 | 5.61E-03 | 4.86E-04 |
| | 26 | 794.32 | 3.35E+01 | 31.36 | 5.55E-03 | 4.78E-04 |
| | 27 | 859.78 | 6.21E+01 | 31.81 | 5.18E-03 | 4.20E-04 |
| | 28 | 911.09 | 1.04E+02 | 43.65 | 4.92E-03 | 3.84E-04 |
| M | 29 | 964.71 | 2.45E+01 | 17.50 | 4.68E-03 | 3.75E-04 |
| m | 30 | 968.66 | 9.55E+01 | 27.93 | 4.67E-03 | 3.74E-04 |
| | 31 | 981.95 | 2.14E+01 | 19.90 | 4.61E-03 | 3.72E-04 |
| | 32 | 1120.44 | 4.30E+01 | 33.29 | 4.12E-03 | 3.50E-04 |
| | 33 | 1274.17 | 4.96E+01 | 39.19 | 3.70E-03 | 3.12E-04 |
| | 34 | 1299.73 | 1.48E+01 | 13.89 | 3.64E-03 | 3.05E-04 |
| | 35 | 1306.30 | 1.74E+01 | 15.36 | 3.62E-03 | 3.03E-04 |
| | 36 | 1357.47 | 8.81E+00 | 10.44 | 3.51E-03 | 2.92E-04 |
| | 37 | 1377.48 | 2.08E+01 | 17.83 | 3.47E-03 | 2.88E-04 |
| | 38 | 1460.73 | 6.20E+02 | 55.88 | 3.31E-03 | 2.75E-04 |
| | 39 | 1507.65 | 1.44E+01 | 12.38 | 3.23E-03 | 2.68E-04 |
| | 40 | 1535.19 | 1.40E+01 | 14.87 | 3.18E-03 | 2.63E-04 |
| | 41 | 1579.89 | 1.21E+01 | 12.00 | 3.11E-03 | 2.56E-04 |
| | 42 | 1591.04 | 4.97E+01 | 16.61 | 3.10E-03 | 2.54E-04 |
| | 43 | 1629.89 | 1.47E+01 | 10.61 | 3.04E-03 | 2.48E-04 |
| | 44 | 1658.73 | 5.67E+00 | 7.35 | 3.00E-03 | 2.43E-04 |
| | 45 | 1729.51 | 1.11E+01 | 11.66 | 2.91E-03 | 2.32E-04 |
| M | 46 | 1764.34 | 4.76E+01 | 18.14 | 2.87E-03 | 2.26E-04 |
| m | 47 | 1767.44 | 1.32E+01 | 11.18 | 2.86E-03 | 2.26E-04 |
| | 48 | 1847.70 | 1.45E+01 | 12.77 | 2.77E-03 | 2.15E-04 |
| | 49 | 1889.33 | 1.16E+01 | 8.73 | 2.73E-03 | 2.15E-04 |
| | 50 | 1907.82 | 8.00E+00 | 5.66 | 2.71E-03 | 2.15E-04 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 51 | 1957.86 | 7.85E+00 | 7.48 | 2.66E-03 | 2.15E-04 |
| 52 | 2103.01 | 1.60E+01 | 8.00 | 2.54E-03 | 2.15E-04 |
| 53 | 2118.30 | 1.06E+01 | 9.59 | 2.53E-03 | 2.15E-04 |
| 54 | 2203.47 | 1.63E+01 | 16.35 | 2.46E-03 | 2.15E-04 |
| 55 | 2448.93 | 1.53E+01 | 9.17 | 2.32E-03 | 2.15E-04 |
| 56 | 2467.51 | 5.00E+00 | 4.47 | 2.31E-03 | 2.15E-04 |
| 57 | 2566.14 | 5.00E+00 | 4.47 | 2.26E-03 | 2.15E-04 |
| 58 | 2614.48 | 6.53E+01 | 18.56 | 2.24E-03 | 2.15E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 11:05:16AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055575.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24.91 | 7.84E+01 | 91.13 | | | 7.84E+01 | 9.11E+01 |
| | 2 | 63.57 | 1.79E+02 | 118.30 | 4.12E+01 | 5.67E+00 | 1.37E+02 | 1.18E+02 |
| M | 3 | 75.06 | 4.28E+02 | 119.02 | | | 4.28E+02 | 1.19E+02 |
| m | 4 | 77.55 | 7.02E+02 | 118.55 | | | 7.02E+02 | 1.19E+02 |
| | 5 | 87.74 | 1.10E+02 | 83.53 | | | 1.10E+02 | 8.35E+01 |
| | 6 | 93.33 | 2.58E+02 | 99.67 | 7.98E+01 | 7.31E+00 | 1.78E+02 | 9.99E+01 |
| | 7 | 186.27 | 1.64E+02 | 75.70 | 3.06E+01 | 5.82E+00 | 1.34E+02 | 7.59E+01 |
| M | 8 | 239.03 | 7.09E+02 | 74.89 | 1.40E+01 | 2.71E+00 | 6.95E+02 | 7.49E+01 |
| m | 9 | 242.40 | 1.82E+02 | 66.19 | | | 1.82E+02 | 6.62E+01 |
| | 10 | 270.11 | 9.70E+01 | 65.68 | | | 9.70E+01 | 6.57E+01 |
| | 11 | 277.38 | 4.48E+01 | 56.04 | | | 4.48E+01 | 5.60E+01 |
| | 12 | 295.47 | 3.33E+02 | 60.05 | | | 3.33E+02 | 6.00E+01 |
| | 13 | 328.92 | 9.07E+01 | 66.37 | | | 9.07E+01 | 6.64E+01 |
| | 14 | 338.39 | 1.15E+02 | 49.98 | | | 1.15E+02 | 5.00E+01 |
| | 15 | 352.34 | 5.54E+02 | 86.11 | 6.53E+00 | 4.43E+00 | 5.48E+02 | 8.62E+01 |
| | 16 | 456.58 | 2.92E+01 | 27.35 | | | 2.92E+01 | 2.74E+01 |
| | 17 | 463.32 | 7.43E+01 | 38.37 | | | 7.43E+01 | 3.84E+01 |
| | 18 | 511.88 | 1.44E+02 | 61.60 | 5.21E+01 | 4.74E+00 | 9.18E+01 | 6.18E+01 |
| | 19 | 583.55 | 1.72E+02 | 49.18 | | | 1.72E+02 | 4.92E+01 |
| | 20 | 609.46 | 3.41E+02 | 51.29 | 3.25E+00 | 2.97E+00 | 3.38E+02 | 5.14E+01 |
| | 21 | 662.70 | 5.69E+01 | 50.68 | | | 5.69E+01 | 5.07E+01 |
| | 22 | 707.78 | 2.89E+01 | 28.00 | | | 2.89E+01 | 2.80E+01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 23 | 727.88 | 4.79E+01 | 31.24 | | | 4.79E+01 | 3.12E+01 |
| | 24 | 755.08 | 3.42E+01 | 32.28 | | | 3.42E+01 | 3.23E+01 |
| | 25 | 785.07 | 4.27E+01 | 28.14 | | | 4.27E+01 | 2.81E+01 |
| | 26 | 794.32 | 3.35E+01 | 31.36 | 0.00E+00 | 0.00E+00 | 3.35E+01 | 3.14E+01 |
| | 27 | 859.78 | 6.21E+01 | 31.81 | | | 6.21E+01 | 3.18E+01 |
| | 28 | 911.09 | 1.04E+02 | 43.65 | 2.85E+00 | 2.76E+00 | 1.01E+02 | 4.37E+01 |
| M | 29 | 964.71 | 2.45E+01 | 17.50 | | | 2.45E+01 | 1.75E+01 |
| m | 30 | 968.66 | 9.55E+01 | 27.93 | | | 9.55E+01 | 2.79E+01 |
| | 31 | 981.95 | 2.14E+01 | 19.90 | | | 2.14E+01 | 1.99E+01 |
| | 32 | 1120.44 | 4.30E+01 | 33.29 | | | 4.30E+01 | 3.33E+01 |
| | 33 | 1274.17 | 4.96E+01 | 39.19 | | | 4.96E+01 | 3.92E+01 |
| | 34 | 1299.73 | 1.48E+01 | 13.89 | | | 1.48E+01 | 1.39E+01 |
| | 35 | 1306.30 | 1.74E+01 | 15.36 | | | 1.74E+01 | 1.54E+01 |
| | 36 | 1357.47 | 8.81E+00 | 10.44 | | | 8.81E+00 | 1.04E+01 |
| | 37 | 1377.48 | 2.08E+01 | 17.83 | | | 2.08E+01 | 1.78E+01 |
| | 38 | 1460.73 | 6.20E+02 | 55.88 | 1.00E+00 | 1.77E+00 | 6.19E+02 | 5.59E+01 |
| | 39 | 1507.65 | 1.44E+01 | 12.38 | | | 1.44E+01 | 1.24E+01 |
| | 40 | 1535.19 | 1.40E+01 | 14.87 | | | 1.40E+01 | 1.49E+01 |
| | 41 | 1579.89 | 1.21E+01 | 12.00 | | | 1.21E+01 | 1.20E+01 |
| | 42 | 1591.04 | 4.97E+01 | 16.61 | | | 4.97E+01 | 1.66E+01 |
| | 43 | 1629.89 | 1.47E+01 | 10.61 | | | 1.47E+01 | 1.06E+01 |
| | 44 | 1658.73 | 5.67E+00 | 7.35 | | | 5.67E+00 | 7.35E+00 |
| | 45 | 1729.51 | 1.11E+01 | 11.66 | | | 1.11E+01 | 1.17E+01 |
| M | 46 | 1764.34 | 4.76E+01 | 18.14 | | | 4.76E+01 | 1.81E+01 |
| m | 47 | 1767.44 | 1.32E+01 | 11.18 | | | 1.32E+01 | 1.12E+01 |
| | 48 | 1847.70 | 1.45E+01 | 12.77 | | | 1.45E+01 | 1.28E+01 |
| | 49 | 1889.33 | 1.16E+01 | 8.73 | | | 1.16E+01 | 8.73E+00 |
| | 50 | 1907.82 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 51 | 1957.86 | 7.85E+00 | 7.48 | | | 7.85E+00 | 7.48E+00 |
| | 52 | 2103.01 | 1.60E+01 | 8.00 | | | 1.60E+01 | 8.00E+00 |
| | 53 | 2118.30 | 1.06E+01 | 9.59 | | | 1.06E+01 | 9.59E+00 |
| | 54 | 2203.47 | 1.63E+01 | 16.35 | | | 1.63E+01 | 1.63E+01 |
| | 55 | 2448.93 | 1.53E+01 | 9.17 | | | 1.53E+01 | 9.17E+00 |
| | 56 | 2467.51 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |
| | 57 | 2566.14 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |
| | 58 | 2614.48 | 6.53E+01 | 18.56 | 1.86E+00 | 1.12E+00 | 6.35E+01 | 1.86E+01 |

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

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 11:05:16AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055575.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 24.91 | 7.84E+01 | 91.13 | | | 7.84E+01 | 9.11E+01 |
| | 2 | 63.57 | 1.79E+02 | 118.30 | 4.12E+01 | 5.67E+00 | 1.37E+02 | 1.18E+02 |
| M | 3 | 75.06 | 4.28E+02 | 119.02 | | | 4.28E+02 | 1.19E+02 |
| m | 4 | 77.55 | 7.02E+02 | 118.55 | | | 7.02E+02 | 1.19E+02 |
| | 5 | 87.74 | 1.10E+02 | 83.53 | | | 1.10E+02 | 8.35E+01 |
| | 6 | 93.33 | 2.58E+02 | 99.67 | 7.98E+01 | 7.31E+00 | 1.78E+02 | 9.99E+01 |
| | 7 | 186.27 | 1.64E+02 | 75.70 | 3.06E+01 | 5.82E+00 | 1.34E+02 | 7.59E+01 |
| M | 8 | 239.03 | 7.09E+02 | 74.89 | 1.40E+01 | 2.71E+00 | 6.95E+02 | 7.49E+01 |
| m | 9 | 242.40 | 1.82E+02 | 66.19 | | | 1.82E+02 | 6.62E+01 |
| | 10 | 270.11 | 9.70E+01 | 65.68 | | | 9.70E+01 | 6.57E+01 |
| | 11 | 277.38 | 4.48E+01 | 56.04 | | | 4.48E+01 | 5.60E+01 |
| | 12 | 295.47 | 3.33E+02 | 60.05 | | | 3.33E+02 | 6.00E+01 |
| | 13 | 328.92 | 9.07E+01 | 66.37 | | | 9.07E+01 | 6.64E+01 |
| | 14 | 338.39 | 1.15E+02 | 49.98 | | | 1.15E+02 | 5.00E+01 |
| | 15 | 352.34 | 5.54E+02 | 86.11 | 6.53E+00 | 4.43E+00 | 5.48E+02 | 8.62E+01 |
| | 16 | 456.58 | 2.92E+01 | 27.35 | | | 2.92E+01 | 2.74E+01 |
| | 17 | 463.32 | 7.43E+01 | 38.37 | | | 7.43E+01 | 3.84E+01 |
| | 18 | 511.88 | 1.44E+02 | 61.60 | 5.21E+01 | 4.74E+00 | 9.18E+01 | 6.18E+01 |
| | 19 | 583.55 | 1.72E+02 | 49.18 | | | 1.72E+02 | 4.92E+01 |
| | 20 | 609.46 | 3.41E+02 | 51.29 | 3.25E+00 | 2.97E+00 | 3.38E+02 | 5.14E+01 |
| | 21 | 662.70 | 5.69E+01 | 50.68 | | | 5.69E+01 | 5.07E+01 |
| | 22 | 707.78 | 2.89E+01 | 28.00 | | | 2.89E+01 | 2.80E+01 |
| | 23 | 727.88 | 4.79E+01 | 31.24 | | | 4.79E+01 | 3.12E+01 |
| | 24 | 755.08 | 3.42E+01 | 32.28 | | | 3.42E+01 | 3.23E+01 |
| | 25 | 785.07 | 4.27E+01 | 28.14 | | | 4.27E+01 | 2.81E+01 |
| | 26 | 794.32 | 3.35E+01 | 31.36 | 0.00E+00 | 0.00E+00 | 3.35E+01 | 3.14E+01 |
| | 27 | 859.78 | 6.21E+01 | 31.81 | | | 6.21E+01 | 3.18E+01 |
| | 28 | 911.09 | 1.04E+02 | 43.65 | 2.85E+00 | 2.76E+00 | 1.01E+02 | 4.37E+01 |
| M | 29 | 964.71 | 2.45E+01 | 17.50 | | | 2.45E+01 | 1.75E+01 |
| m | 30 | 968.66 | 9.55E+01 | 27.93 | | | 9.55E+01 | 2.79E+01 |
| | 31 | 981.95 | 2.14E+01 | 19.90 | | | 2.14E+01 | 1.99E+01 |
| | 32 | 1120.44 | 4.30E+01 | 33.29 | | | 4.30E+01 | 3.33E+01 |
| | 33 | 1274.17 | 4.96E+01 | 39.19 | | | 4.96E+01 | 3.92E+01 |
| | 34 | 1299.73 | 1.48E+01 | 13.89 | | | 1.48E+01 | 1.39E+01 |
| | 35 | 1306.30 | 1.74E+01 | 15.36 | | | 1.74E+01 | 1.54E+01 |
| | 36 | 1357.47 | 8.81E+00 | 10.44 | | | 8.81E+00 | 1.04E+01 |
| | 37 | 1377.48 | 2.08E+01 | 17.83 | | | 2.08E+01 | 1.78E+01 |
| | 38 | 1460.73 | 6.20E+02 | 55.88 | 1.00E+00 | 1.77E+00 | 6.19E+02 | 5.59E+01 |
| | 39 | 1507.65 | 1.44E+01 | 12.38 | | | 1.44E+01 | 1.24E+01 |
| | 40 | 1535.19 | 1.40E+01 | 14.87 | | | 1.40E+01 | 1.49E+01 |
| | 41 | 1579.89 | 1.21E+01 | 12.00 | | | 1.21E+01 | 1.20E+01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 42 | 1591.04 | 4.97E+01 | 16.61 | | | 4.97E+01 | 1.66E+01 |
| | 43 | 1629.89 | 1.47E+01 | 10.61 | | | 1.47E+01 | 1.06E+01 |
| | 44 | 1658.73 | 5.67E+00 | 7.35 | | | 5.67E+00 | 7.35E+00 |
| | 45 | 1729.51 | 1.11E+01 | 11.66 | | | 1.11E+01 | 1.17E+01 |
| M | 46 | 1764.34 | 4.76E+01 | 18.14 | | | 4.76E+01 | 1.81E+01 |
| m | 47 | 1767.44 | 1.32E+01 | 11.18 | | | 1.32E+01 | 1.12E+01 |
| | 48 | 1847.70 | 1.45E+01 | 12.77 | | | 1.45E+01 | 1.28E+01 |
| | 49 | 1889.33 | 1.16E+01 | 8.73 | | | 1.16E+01 | 8.73E+00 |
| | 50 | 1907.82 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 51 | 1957.86 | 7.85E+00 | 7.48 | | | 7.85E+00 | 7.48E+00 |
| | 52 | 2103.01 | 1.60E+01 | 8.00 | | | 1.60E+01 | 8.00E+00 |
| | 53 | 2118.30 | 1.06E+01 | 9.59 | | | 1.06E+01 | 9.59E+00 |
| | 54 | 2203.47 | 1.63E+01 | 16.35 | | | 1.63E+01 | 1.63E+01 |
| | 55 | 2448.93 | 1.53E+01 | 9.17 | | | 1.53E+01 | 9.17E+00 |
| | 56 | 2467.51 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |
| | 57 | 2566.14 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |
| | 58 | 2614.48 | 6.53E+01 | 18.56 | 1.86E+00 | 1.12E+00 | 6.35E+01 | 1.86E+01 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| NA-22 | 0.978 | 1274.54 | * | 99.94 | 1.73E-01 | 1.38E-01 |
| K-40 | 0.999 | 1460.81 | * | 10.67 | 2.10E+01 | 2.62E+00 |
| CD-109 | 0.987 | 88.03 | * | 3.72 | 1.51E+00 | 1.16E+00 |
| SN-126 | 0.995 | 87.57 | * | 37.00 | 1.31E-01 | 1.00E-01 |
| TL-208 | 0.983 | 583.14 | * | 30.22 | 9.30E-01 | 2.81E-01 |
| | | 860.37 | * | 4.48 | 3.21E+00 | 1.67E+00 |
| | | 2614.66 | * | 35.85 | 9.49E-01 | 2.93E-01 |
| BI-212 | 0.709 | 727.17 | * | 11.80 | 8.11E-01 | 5.34E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.872 | 238.63 | * | 44.60 | 1.16E+00 | 1.58E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.991 | 609.31 | * | 46.30 | 1.24E+00 | 2.23E-01 |
| | | 1120.29 | * | 15.10 | 8.30E-01 | 6.47E-01 |
| | | 1764.49 | * | 15.80 | 1.26E+00 | 4.91E-01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| BI-214 | 0.991 | 2204.22 | * | 4.98 | 1.59E+00 | 1.60E+00 |
| PB-214 | 0.978 | 295.21 | * | 19.19 | 1.55E+00 | 3.09E-01 |
| | | 351.92 | * | 37.19 | 1.53E+00 | 2.78E-01 |
| RA-226 | 0.999 | 186.21 | * | 3.28 | 2.50E+00 | 4.79E+00 |
| AC-228 | 0.990 | 338.32 | * | 11.40 | 1.01E+00 | 4.49E-01 |
| | | 911.07 | * | 27.70 | 8.89E-01 | 3.91E-01 |
| | | 969.11 | * | 16.60 | 1.48E+00 | 4.49E-01 |
| TH-234 | 0.987 | 63.29 | * | 3.80 | 1.77E+00 | 1.53E+00 |
| AM-243 | 0.976 | 74.67 | * | 66.00 | 2.94E-01 | 8.46E-02 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 11:05:16AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 24.91 | 2.17647E-02 | 58.15 | Tol. | TH-231 |
| m | 4 | 77.55 | 1.95045E-01 | 8.44 | | |
| | 6 | 93.33 | 4.95479E-02 | 28.01 | Tol. | GA-67 |
| m | 9 | 242.40 | 5.05236E-02 | 18.20 | | |
| | 10 | 270.11 | 2.69473E-02 | 33.85 | | |
| | 11 | 277.38 | 1.24483E-02 | 62.52 | Tol. | NP-239<br>CM-243 |
| | 13 | 328.92 | 2.51991E-02 | 36.58 | Tol. | LA-140 |
| | 16 | 456.58 | 8.11508E-03 | 46.82 | | |
| | 17 | 463.32 | 2.06387E-02 | 25.82 | Tol. | SB-125 |
| | 18 | 511.88 | 2.55000E-02 | 33.65 | | |
| | 21 | 662.70 | 1.58147E-02 | 44.50 | | |
| | 22 | 707.78 | 8.01587E-03 | 48.51 | | |
| | 24 | 755.08 | 9.50680E-03 | 47.16 | | |
| | 25 | 785.07 | 1.18558E-02 | 32.97 | | |
| | 26 | 794.32 | 9.31818E-03 | 46.74 | | |
| M | 29 | 964.71 | 6.81552E-03 | 35.66 | Tol. | EU-152 |
| | 31 | 981.95 | 5.95556E-03 | 46.41 | | |
| | 34 | 1299.73 | 4.09722E-03 | 47.09 | | |
| | 35 | 1306.30 | 4.83871E-03 | 44.10 | Sum | |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 36 | 1357.47 | 2.44792E-03 | 59.24 | | |
| | 37 | 1377.48 | 5.76567E-03 | 42.96 | | |
| | 39 | 1507.65 | 3.99155E-03 | 43.08 | | |
| | 40 | 1535.19 | 3.88889E-03 | 53.09 | Sum | |
| | 41 | 1579.89 | 3.34722E-03 | 49.79 | | |
| | 42 | 1591.04 | 1.37919E-02 | 16.73 | | |
| | 43 | 1629.89 | 4.07407E-03 | 36.16 | | |
| | 44 | 1658.73 | 1.57407E-03 | 64.84 | | |
| | 45 | 1729.51 | 3.08642E-03 | 52.48 | Sum | |
| m | 47 | 1767.44 | 3.66420E-03 | 42.38 | | |
| | 48 | 1847.70 | 4.02778E-03 | 44.02 | Sum | |
| | 49 | 1889.33 | 3.22421E-03 | 37.62 | | |
| | 50 | 1907.82 | 2.22222E-03 | 35.36 | | |
| | 51 | 1957.86 | 2.18056E-03 | 47.66 | | |
| | 52 | 2103.01 | 4.44444E-03 | 25.00 | S-Esc | |
| | 53 | 2118.30 | 2.94444E-03 | 45.24 | | |
| | 55 | 2448.93 | 4.25654E-03 | 29.91 | | |
| | 56 | 2467.51 | 1.38889E-03 | 44.72 | | |
| | 57 | 2566.14 | 1.38889E-03 | 44.72 | | |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| NA-22 | 0.97 | 1274.54 | * | 99.94 | 1.73E-01 | 1.38E-01 |
| K-40 | 0.99 | 1460.81 | * | 10.67 | 2.10E+01 | 2.62E+00 |
| CD-109 | 0.98 | 88.03 | * | 3.72 | 1.51E+00 | 1.16E+00 |
| SN-126 | 0.99 | 87.57 | * | 37.00 | 1.31E-01 | 1.00E-01 |
| TL-208 | 0.98 | 583.14 | * | 30.22 | 9.30E-01 | 2.81E-01 |
| | | 860.37 | * | 4.48 | 3.21E+00 | 1.67E+00 |
| | | 2614.66 | * | 35.85 | 9.49E-01 | 2.93E-01 |
| BI-212 | 0.70 | 727.17 | * | 11.80 | 8.11E-01 | 5.34E-01 |
| | | 1620.62 | | 2.75 | | |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| PB-212 | 0.87 | 238.63 | * | 44.60 | 1.16E+00 | 1.58E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.99 | 609.31 | * | 46.30 | 1.24E+00 | 2.23E-01 |
| | | 1120.29 | * | 15.10 | 8.30E-01 | 6.47E-01 |
| | | 1764.49 | * | 15.80 | 1.26E+00 | 4.91E-01 |
| | | 2204.22 | * | 4.98 | 1.59E+00 | 1.60E+00 |
| PB-214 | 0.97 | 295.21 | * | 19.19 | 1.55E+00 | 3.09E-01 |
| | | 351.92 | * | 37.19 | 1.53E+00 | 2.78E-01 |
| RA-226 | 0.99 | 186.21 | * | 3.28 | 2.50E+00 | 4.79E+00 |
| AC-228 | 0.99 | 338.32 | * | 11.40 | 1.01E+00 | 4.49E-01 |
| | | 911.07 | * | 27.70 | 8.89E-01 | 3.91E-01 |
| | | 969.11 | * | 16.60 | 1.48E+00 | 4.49E-01 |
| TH-234 | 0.98 | 63.29 | * | 3.80 | 1.77E+00 | 1.53E+00 |
| AM-243 | 0.97 | 74.67 | * | 66.00 | 2.94E-01 | 8.46E-02 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | NA-22 | 0.978 | 1.73E-01 | 1.38E-01 | |
| | K-40 | 0.999 | 2.10E+01 | 2.62E+00 | |
| ? | CD-109 | 0.987 | 1.51E+00 | 1.16E+00 | |
| ? | SN-126 | 0.995 | 1.31E-01 | 1.00E-01 | |
| | TL-208 | 0.983 | 9.73E-01 | 2.01E-01 | |
| | BI-212 | 0.709 | 8.11E-01 | 5.34E-01 | |
| | PB-212 | 0.872 | 1.16E+00 | 1.58E-01 | |
| | BI-214 | 0.991 | 1.22E+00 | 1.92E-01 | |
| | PB-214 | 0.978 | 1.54E+00 | 2.06E-01 | |
| | RA-226 | 0.999 | 2.50E+00 | 4.79E+00 | |
| | AC-228 | 0.990 | 1.10E+00 | 2.47E-01 | |
| | TH-234 | 0.987 | 1.77E+00 | 1.53E+00 | |
| | AM-243 | 0.976 | 2.94E-01 | 8.46E-02 | |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 11:05:16AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 1 | 24.91 | 2.17647E-02 | 58.15 | Tol. | TH-231 |
| m | 4 | 77.55 | 1.95045E-01 | 8.44 | | |
| | 6 | 93.33 | 4.95479E-02 | 28.01 | Tol. | GA-67 |
| m | 9 | 242.40 | 5.05236E-02 | 18.20 | | |
| | 10 | 270.11 | 2.69473E-02 | 33.85 | | |
| | 11 | 277.38 | 1.24483E-02 | 62.52 | Tol. | NP-239<br>CM-243 |
| | 13 | 328.92 | 2.51991E-02 | 36.58 | Tol. | LA-140 |
| | 16 | 456.58 | 8.11508E-03 | 46.82 | | |
| | 17 | 463.32 | 2.06387E-02 | 25.82 | Tol. | SB-125 |
| | 18 | 511.88 | 2.55000E-02 | 33.65 | | |
| | 21 | 662.70 | 1.58147E-02 | 44.50 | | |
| | 22 | 707.78 | 8.01587E-03 | 48.51 | | |
| | 24 | 755.08 | 9.50680E-03 | 47.16 | | |
| | 25 | 785.07 | 1.18558E-02 | 32.97 | | |
| | 26 | 794.32 | 9.31818E-03 | 46.74 | | |
| M | 29 | 964.71 | 6.81552E-03 | 35.66 | Tol. | EU-152 |
| | 31 | 981.95 | 5.95556E-03 | 46.41 | | |
| | 34 | 1299.73 | 4.09722E-03 | 47.09 | | |
| | 35 | 1306.30 | 4.83871E-03 | 44.10 | Sum | |
| | 36 | 1357.47 | 2.44792E-03 | 59.24 | | |
| | 37 | 1377.48 | 5.76567E-03 | 42.96 | | |
| | 39 | 1507.65 | 3.99155E-03 | 43.08 | | |
| | 40 | 1535.19 | 3.88889E-03 | 53.09 | Sum | |
| | 41 | 1579.89 | 3.34722E-03 | 49.79 | | |
| | 42 | 1591.04 | 1.37919E-02 | 16.73 | | |
| | 43 | 1629.89 | 4.07407E-03 | 36.16 | | |
| | 44 | 1658.73 | 1.57407E-03 | 64.84 | | |
| | 45 | 1729.51 | 3.08642E-03 | 52.48 | Sum | |
| m | 47 | 1767.44 | 3.66420E-03 | 42.38 | | |
| | 48 | 1847.70 | 4.02778E-03 | 44.02 | Sum | |
| | 49 | 1889.33 | 3.22421E-03 | 37.62 | | |
| | 50 | 1907.82 | 2.22222E-03 | 35.36 | | |
| | 51 | 1957.86 | 2.18056E-03 | 47.66 | | |
| | 52 | 2103.01 | 4.44444E-03 | 25.00 | S-Esc | |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 53 | 2118.30 | 2.94444E-03 | 45.24 | | |
| 55 | 2448.93 | 4.25654E-03 | 29.91 | | |
| 56 | 2467.51 | 1.38889E-03 | 44.72 | | |
| 57 | 2566.14 | 1.38889E-03 | 44.72 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | | 10.42 | 1.52E+00 | 2.63E+00 | 2.63E+00 |
| + | NA-22 | 1274.54 | * | 99.94 | 1.73E-01 | 2.20E-01 | 2.20E-01 |
| + | @ NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 2754.09 | | 99.86 | 0.00E+00 | | 1.00E+26 |
| + | AL-26 | 1808.65 | | 99.76 | 9.26E-03 | 4.60E-02 | 4.60E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 2.10E+01 | 1.52E+00 | 1.52E+00 |
| + | @ AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | TI-44 | 67.88 | | 94.40 | 9.68E-03 | 6.54E-02 | 6.54E-02 |
| | | 78.34 | | 96.00 | 2.06E-01 | | 7.93E-02 |
| + | SC-46 | 889.25 | | 99.98 | -6.10E-02 | 1.88E-01 | 1.88E-01 |
| | | 1120.51 | | 99.99 | 3.05E-01 | | 3.29E-01 |
| + | V-48 | 983.52 | | 99.98 | 7.21E-01 | 5.39E+00 | 7.25E+00 |
| | | 1312.10 | | 97.50 | -1.85E+00 | | 5.39E+00 |
| + | CR-51 | 320.08 | | 9.83 | 2.62E+00 | 7.92E+00 | 7.92E+00 |
| + | MN-54 | 834.83 | | 99.97 | 7.19E-02 | 1.12E-01 | 1.12E-01 |
| + | CO-56 | 846.75 | | 99.96 | 9.74E-02 | 2.23E-01 | 2.23E-01 |
| | | 1037.75 | | 14.03 | 1.92E-01 | | 1.72E+00 |
| | | 1238.25 | | 67.00 | 1.50E-01 | | 4.81E-01 |
| | | 1771.40 | | 15.51 | 4.54E-02 | | 1.26E+00 |
| | | 2598.48 | | 16.90 | 2.27E-01 | | 8.15E-01 |
| + | CO-57 | 122.06 | | 85.51 | -5.77E-02 | 6.81E-02 | 6.81E-02 |
| | | 136.48 | | 10.60 | -4.35E-02 | | 5.51E-01 |
| + | CO-58 | 810.76 | | 99.40 | -7.94E-02 | 2.21E-01 | 2.21E-01 |
| + | FE-59 | 1099.22 | | 56.50 | 0.00E+00 | 8.89E-01 | 8.89E-01 |
| | | 1291.56 | | 43.20 | 5.11E-01 | | 1.03E+00 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | CO-60 | 1173.22 | | 100.00 | 1.14E-01 | 1.04E-01 | 1.33E-01 |
| | | 1332.49 | | 100.00 | 3.32E-02 | | 1.04E-01 |
| + | ZN-65 | 1115.52 | | 50.75 | 2.91E-02 | 2.77E-01 | 2.77E-01 |
| + | GA-67 | 93.31 | | 35.70 | 4.96E+08 | 2.44E+08 | 2.44E+08 |
| | | 208.95 | | 2.24 | 1.58E+09 | | 4.29E+09 |
| | | 300.22 | | 16.00 | -2.93E+08 | | 6.72E+08 |
| + | SE-75 | 121.11 | | 16.70 | -1.29E-01 | 1.40E-01 | 4.85E-01 |
| | | 136.00 | | 59.20 | 3.24E-02 | | 1.40E-01 |
| | | 264.65 | | 59.80 | 1.98E-03 | | 1.91E-01 |
| | | 279.53 | | 25.20 | 1.32E-02 | | 4.69E-01 |
| | | 400.65 | | 11.40 | -3.88E-01 | | 1.03E+00 |
| + | RB-82 | 776.52 | | 13.00 | 7.21E-01 | 9.73E+00 | 9.73E+00 |
| + | RB-83 | 520.41 | | 46.00 | 4.69E-02 | 3.88E-01 | 3.88E-01 |
| | | 529.64 | | 30.30 | -1.39E-01 | | 5.44E-01 |
| | | 552.65 | | 16.40 | 1.12E-01 | | 9.64E-01 |
| + | KR-85 | 513.99 | | 0.43 | 3.82E+00 | 2.21E+01 | 2.21E+01 |
| + | SR-85 | 513.99 | | 99.27 | 4.73E-02 | 2.74E-01 | 2.74E-01 |
| + | Y-88 | 898.02 | | 93.40 | -4.83E-03 | 1.38E-01 | 1.84E-01 |
| | | 1836.01 | | 99.38 | -1.75E-02 | | 1.38E-01 |
| + | MO-93 | 263.06 | | 56.72 | -8.73E-03 | 7.82E-02 | 1.13E-01 |
| | | 684.67 | | 99.68 | -6.15E-04 | | 7.82E-02 |
| | | 1477.11 | | 99.08 | 1.15E-02 | | 8.22E-02 |
| + | NB-93M | 16.57 | | 9.43 | 2.00E+01 | 6.92E+01 | 6.92E+01 |
| + | NB-94 | 702.63 | | 100.00 | 1.45E-02 | 8.64E-02 | 8.64E-02 |
| | | 871.10 | | 100.00 | 5.01E-02 | | 9.36E-02 |
| + | NB-95 | 765.79 | | 99.81 | 2.37E-01 | 6.94E-01 | 6.94E-01 |
| + | NB-95M | 235.69 | | 25.00 | 3.21E+07 | 7.32E+07 | 7.32E+07 |
| + | ZR-95 | 724.18 | | 43.70 | 1.76E-01 | 4.50E-01 | 6.28E-01 |
| | | 756.72 | | 55.30 | 1.29E-03 | | 4.50E-01 |
| + | MO-99 | 181.06 | | 6.20 | 2.66E+10 | 4.83E+10 | 6.23E+10 |
| | | 739.58 | | 12.80 | 9.23E+09 | | 4.83E+10 |
| | | 778.00 | | 4.50 | -3.50E+10 | | 1.31E+11 |
| + | RU-103 | 497.08 | | 89.00 | 8.22E-02 | 4.89E-01 | 4.89E-01 |
| + | RU-106 | 621.84 | | 9.80 | 3.20E-01 | 9.24E-01 | 9.24E-01 |
| + | AG-108M | 433.93 | | 89.90 | -3.58E-02 | 7.79E-02 | 7.79E-02 |
| | | 614.37 | | 90.40 | 1.05E-02 | | 1.11E-01 |
| | | 722.95 | | 90.50 | 2.01E-02 | | 9.22E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 1.51E+00 | 1.87E+00 | 1.87E+00 |
| + | AG-110M | 657.75 | | 93.14 | 1.20E-02 | 1.29E-01 | 1.29E-01 |
| | | 677.61 | | 10.53 | 3.74E-01 | | 1.01E+00 |
| | | 706.67 | | 16.46 | 1.85E-01 | | 6.78E-01 |
| | | 763.93 | | 21.98 | -2.83E-01 | | 5.14E-01 |
| | | 884.67 | | 71.63 | 4.68E-02 | | 1.68E-01 |
| | | 1384.27 | | 23.94 | -1.57E-02 | | 4.29E-01 |
| + | CD-113M | 263.70 | | 0.02 | -5.44E+00 | 2.81E+02 | 2.81E+02 |
| + | SN-113 | 255.12 | | 1.93 | 1.54E+00 | 1.98E-01 | 5.68E+00 |
| | | 391.69 | | 64.90 | -3.71E-02 | | 1.98E-01 |
| + | TE123M | 159.00 | | 84.10 | -5.61E-02 | 1.03E-01 | 1.03E-01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | SB-124 | 602.71 | | 97.87 | -9.61E-03 | 2.38E-01 | 2.38E-01 |
| | | 645.85 | | 7.26 | -2.24E-01 | | 3.48E+00 |
| | | 722.78 | | 11.10 | 5.13E-01 | | 2.35E+00 |
| | | 1691.02 | | 49.00 | -2.60E-02 | | 4.12E-01 |
| + | I-125 | 35.49 | | 6.49 | -5.53E+00 | 5.90E+00 | 5.90E+00 |
| + | SB-125 | 176.33 | | 6.89 | 1.72E-01 | 2.73E-01 | 8.12E-01 |
| | | 427.89 | | 29.33 | 7.91E-02 | | 2.73E-01 |
| | | 463.38 | | 10.35 | 6.92E-01 | | 8.40E-01 |
| | | 600.56 | | 17.80 | -2.28E-02 | | 4.48E-01 |
| | | 635.90 | | 11.32 | -5.14E-01 | | 6.28E-01 |
| + | SB-126 | 414.70 | | 83.30 | -1.90E+00 | 2.14E+01 | 2.14E+01 |
| | | 666.33 | | 99.60 | -6.91E+00 | | 2.37E+01 |
| | | 695.00 | | 99.60 | 7.98E+00 | | 2.30E+01 |
| | | 720.50 | | 53.80 | 1.43E+01 | | 4.00E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 1.31E-01 | 1.62E-01 | 1.62E-01 |
| + | SB-127 | 473.00 | | 25.00 | -5.00E+06 | 1.23E+07 | 1.52E+07 |
| | | 685.20 | | 35.70 | -9.64E+04 | | 1.23E+07 |
| | | 783.80 | | 14.70 | 3.40E+07 | | 3.88E+07 |
| + | I-129 | 29.78 | | 57.00 | -1.81E-01 | 3.84E-01 | 3.84E-01 |
| | | 33.60 | | 13.20 | 8.53E-01 | | 1.13E+00 |
| | | 39.58 | | 7.52 | 4.83E-01 | | 1.29E+00 |
| + | I-131 | 284.30 | | 6.05 | 2.60E+03 | 4.25E+02 | 5.70E+03 |
| | | 364.48 | | 81.20 | 1.29E+02 | | 4.25E+02 |
| | | 636.97 | | 7.26 | -3.15E+03 | | 4.94E+03 |
| | | 722.89 | | 1.80 | 5.23E+03 | | 2.40E+04 |
| + | TE-132 | 49.72 | | 13.10 | -7.20E+08 | 1.07E+08 | 7.78E+08 |
| | | 228.16 | | 88.00 | 3.04E+07 | | 1.07E+08 |
| + | BA-133 | 81.00 | | 33.00 | -6.45E-01 | 1.69E-01 | 1.74E-01 |
| | | 302.84 | | 17.80 | 2.13E-01 | | 3.96E-01 |
| | | 356.01 | | 60.00 | 2.00E-01 | | 1.69E-01 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -2.73E+05 | 7.36E+04 | 7.36E+04 |
| + | CS-134 | 563.23 | | 8.38 | -6.75E-01 | 1.03E-01 | 9.09E-01 |
| | | 569.32 | | 15.43 | 1.33E-01 | | 5.68E-01 |
| | | 604.70 | | 97.60 | -1.27E-02 | | 1.03E-01 |
| | | 795.84 | | 85.40 | 7.77E-02 | | 1.31E-01 |
| | | 801.93 | | 8.73 | -3.55E-01 | | 1.06E+00 |
| + | CS-135 | 268.24 | | 16.00 | 2.28E-01 | 4.46E-01 | 4.46E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | 7.10E+01 | 1.62E+01 | 1.29E+02 |
| | | 163.89 | | 4.61 | 1.13E+02 | | 2.11E+02 |
| | | 176.55 | | 13.56 | 1.52E+01 | | 7.17E+01 |
| | | 273.65 | | 12.66 | 1.45E-02 | | 1.01E+02 |
| | | 340.57 | | 48.50 | 3.41E+00 | | 3.25E+01 |
| | | 818.50 | | 99.70 | 3.52E+00 | | 1.62E+01 |
| | | 1048.07 | | 79.60 | -6.43E-01 | | 2.25E+01 |
| | | 1235.34 | | 19.70 | 7.85E+01 | | 1.39E+02 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | CS-137 | 661.65 | 85.12 | 1.08E-01 | 1.27E-01 | 1.27E-01 |
| + | LA-138 | 788.74 | 34.00 | -2.10E-01 | 1.12E-01 | 2.52E-01 |
| | | 1435.80 | 66.00 | -2.91E-02 | | 1.12E-01 |
| + | CE-139 | 165.85 | 80.35 | 1.68E-02 | 1.03E-01 | 1.03E-01 |
| + | BA-140 | 162.64 | 6.70 | 8.52E+01 | 5.90E+01 | 1.68E+02 |
| | | 304.84 | 4.50 | -1.37E+01 | | 3.14E+02 |
| | | 423.70 | 3.20 | -7.56E+01 | | 5.02E+02 |
| | | 437.55 | 2.00 | 9.57E+01 | | 8.08E+02 |
| | | 537.32 | 25.00 | -5.61E+01 | | 5.90E+01 |
| + | LA-140 | 328.77 | 20.50 | 9.13E+01 | 2.16E+01 | 8.00E+01 |
| | | 487.03 | 45.50 | 2.77E+00 | | 3.30E+01 |
| | | 815.85 | 23.50 | 5.30E+00 | | 7.83E+01 |
| | | 1596.49 | 95.49 | -1.60E-01 | | 2.16E+01 |
| + | CE-141 | 145.44 | 48.40 | 2.01E-01 | 8.52E-01 | 8.52E-01 |
| + | @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | CE-144 | 133.54 | 10.80 | -1.46E-01 | 5.51E-01 | 5.51E-01 |
| + | PM-144 | 476.78 | 42.00 | 1.06E-02 | 9.49E-02 | 2.11E-01 |
| | | 618.01 | 98.60 | 2.67E-02 | | 9.49E-02 |
| | | 696.49 | 99.49 | -1.23E-02 | | 1.05E-01 |
| + | PM-145 | 36.85 | 21.70 | 7.37E-02 | 2.76E-01 | 5.21E-01 |
| | | 37.36 | 39.70 | -1.24E-02 | | 2.76E-01 |
| | | 42.30 | 15.10 | 7.68E-02 | | 5.85E-01 |
| | | 72.40 | 2.31 | -5.11E+00 | | 2.98E+00 |
| + | PM-146 | 453.90 | 39.94 | -9.50E-02 | 1.83E-01 | 1.83E-01 |
| | | 735.90 | 14.01 | -3.07E-01 | | 5.82E-01 |
| | | 747.13 | 13.10 | 1.97E-01 | | 6.50E-01 |
| + | ND-147 | 91.11 | 28.90 | -1.08E+02 | 1.08E+02 | 1.08E+02 |
| | | 531.02 | 13.10 | 1.42E+02 | | 3.10E+02 |
| + | PM-149 | 285.90 | 3.10 | 3.77E+13 | 6.91E+13 | 6.91E+13 |
| + | EU-152 | 121.78 | 20.50 | -1.89E-01 | 2.23E-01 | 2.23E-01 |
| | | 244.69 | 5.40 | -2.20E+00 | | 1.44E+00 |
| | | 344.27 | 19.13 | 5.55E-02 | | 3.59E-01 |
| | | 778.89 | 9.20 | -2.07E-01 | | 9.07E-01 |
| | | 964.01 | 10.40 | -2.69E+00 | | 9.75E-01 |
| | | 1085.78 | 7.22 | 8.37E-01 | | 1.51E+00 |
| | | 1112.02 | 9.60 | 4.32E-01 | | 1.12E+00 |
| | | 1407.95 | 14.94 | 1.64E-01 | | 6.32E-01 |
| + | GD-153 | 97.43 | 31.30 | 5.44E-02 | 2.01E-01 | 2.01E-01 |
| | | 103.18 | 22.20 | -4.55E-02 | | 2.78E-01 |
| + | EU-154 | 123.07 | 40.50 | -4.64E-02 | 1.18E-01 | 1.18E-01 |
| | | 723.30 | 19.70 | 9.43E-02 | | 4.32E-01 |
| | | 873.19 | 11.50 | -1.32E-01 | | 7.96E-01 |
| | | 996.32 | 10.30 | -1.16E-01 | | 9.56E-01 |
| | | 1004.76 | 17.90 | 1.53E-01 | | 5.45E-01 |
| | | 1274.45 | 35.50 | -1.62E-01 | | 3.30E-01 |
| + | EU-155 | 86.50 | 30.90 | 2.17E-01 | 2.05E-01 | 2.05E-01 |
| | | 105.30 | 20.70 | -1.07E-01 | | 2.27E-01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | EU-156 | 811.77 | | 10.40 | -3.93E+01 | 7.23E+01 | 7.23E+01 |
| | | 1153.47 | | 7.20 | -5.28E+00 | | 1.40E+02 |
| | | 1230.71 | | 8.90 | 1.71E+01 | | 1.41E+02 |
| + | HO-166M | 184.41 | | 72.60 | 1.09E-01 | 8.77E-02 | 8.77E-02 |
| | | 280.45 | | 29.60 | 2.20E-02 | | 2.20E-01 |
| | | 410.94 | | 11.10 | 8.89E-02 | | 6.69E-01 |
| | | 711.69 | | 54.10 | 2.03E-02 | | 1.45E-01 |
| + | TM-171 | 66.72 | | 0.14 | 1.19E+01 | 5.02E+01 | 5.02E+01 |
| + | HF-172 | 67.35 | | 5.31 | 1.91E-01 | 4.85E-01 | 1.29E+00 |
| | | 125.81 | | 11.30 | 1.30E-01 | | 4.85E-01 |
| + | LU-172 | 181.53 | | 20.60 | 1.00E+03 | 4.79E+03 | 7.27E+03 |
| | | 900.72 | | 29.81 | 4.22E+02 | | 8.63E+03 |
| | | 1093.66 | | 62.50 | 1.95E+03 | | 4.79E+03 |
| + | LU-173 | 100.72 | | 5.24 | 8.06E-01 | 3.80E-01 | 1.06E+00 |
| | | 272.11 | | 21.20 | 1.15E-01 | | 3.80E-01 |
| + | HF-175 | 343.40 | | 84.00 | 3.32E-02 | 2.15E-01 | 2.15E-01 |
| + | LU-176 | 88.34 | | 13.30 | -8.05E-02 | 6.32E-02 | 4.55E-01 |
| | | 201.83 | | 86.00 | -1.15E-02 | | 6.32E-02 |
| | | 306.78 | | 94.00 | -6.36E-03 | | 6.73E-02 |
| + | HF-181 | 133.02 | | 41.70 | -6.91E-02 | 4.47E-01 | 5.79E-01 |
| | | 345.85 | | 17.20 | 2.27E-01 | | 2.05E+00 |
| | | 482.03 | | 82.80 | 2.33E-02 | | 4.47E-01 |
| + | TA-182 | 67.75 | | 41.20 | 4.04E-02 | 2.73E-01 | 2.73E-01 |
| | | 1121.30 | | 34.90 | 7.64E-01 | | 7.61E-01 |
| | | 1189.05 | | 16.23 | -4.99E-01 | | 1.27E+00 |
| | | 1221.41 | | 26.98 | -2.15E-02 | | 8.34E-01 |
| | | 1231.02 | | 11.44 | 2.63E-01 | | 2.16E+00 |
| + | IR-192 | 308.46 | | 29.68 | -3.47E-01 | 3.51E-01 | 5.22E-01 |
| | | 468.07 | | 48.10 | 5.48E-02 | | 3.51E-01 |
| + | HG-203 | 279.19 | | 77.30 | 9.66E-02 | 3.74E-01 | 3.74E-01 |
| + | TL-204 | 374.74 | | 94.11 | -3.17E-02 | 7.31E-02 | 7.31E-02 |
| | | 899.15 | | 99.16 | -4.53E-02 | | 9.26E-02 |
| | | 911.74 | | 91.10 | 2.49E-01 | | 1.76E-01 |
| + | BI-207 | 569.67 | | 97.72 | 5.28E-02 | 8.54E-02 | 8.54E-02 |
| | | 1063.62 | | 74.90 | -1.12E-02 | | 1.31E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 9.30E-01 | 2.76E-01 | 3.86E-01 |
| | | 860.37 | * | 4.48 | 3.21E+00 | | 2.49E+00 |
| | | 2614.66 | * | 35.85 | 9.49E-01 | | 2.76E-01 |
| + | BI-210M | 262.00 | | 45.00 | -5.89E-02 | 1.36E-01 | 1.36E-01 |
| | | 300.00 | | 23.00 | -1.42E-01 | | 3.25E-01 |
| + | PB-210 | 46.50 | | 4.25 | 2.00E+00 | 1.93E+00 | 1.93E+00 |
| + | PB-211 | 404.84 | | 2.90 | -3.09E-01 | 2.46E+00 | 2.46E+00 |
| | | 831.96 | | 2.90 | -8.07E-01 | | 2.61E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 8.11E-01 | 8.26E-01 | 8.26E-01 |
| | | 1620.62 | | 2.75 | 1.49E+00 | | 3.13E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.16E+00 | 2.61E-01 | 2.61E-01 |
| | | 300.09 | | 3.41 | -9.57E-01 | | 2.19E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 1.24E+00 | 2.27E-01 | 2.27E-01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | BI-214 | 1120.29 | * | 15.10 | 8.30E-01 | 2.27E-01 | 1.02E+00 |
| | | 1764.49 | * | 15.80 | 1.26E+00 | | 6.16E-01 |
| | | 2204.22 | * | 4.98 | 1.59E+00 | | 2.55E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 1.55E+00 | 3.41E-01 | 3.77E-01 |
| | | 351.92 | * | 37.19 | 1.53E+00 | | 3.41E-01 |
| + | RN-219 | 401.80 | | 6.50 | -1.66E-01 | 1.04E+00 | 1.04E+00 |
| + | RA-223 | 323.87 | | 3.88 | 2.20E-01 | 1.71E+00 | 1.71E+00 |
| + | RA-224 | 240.98 | | 3.95 | 1.62E+01 | 3.12E+00 | 3.12E+00 |
| + | RA-225 | 40.00 | | 31.00 | 1.19E+01 | 3.18E+01 | 3.18E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.50E+00 | 2.27E+00 | 2.27E+00 |
| + | TH-227 | 50.10 | | 8.40 | -7.60E-01 | 8.21E-01 | 8.21E-01 |
| | | 236.00 | | 11.50 | 3.73E-01 | | 8.51E-01 |
| | | 256.20 | | 6.30 | -4.37E-02 | | 9.43E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.01E+00 | 5.86E-01 | 6.79E-01 |
| | | 911.07 | * | 27.70 | 8.89E-01 | | 5.86E-01 |
| | | 969.11 | * | 16.60 | 1.48E+00 | | 1.40E+00 |
| + | TH-230 | 48.44 | | 16.90 | 3.73E-01 | 4.50E-01 | 4.50E-01 |
| | | 62.85 | | 4.60 | 1.60E+00 | | 1.50E+00 |
| | | 67.67 | | 0.37 | 2.47E+00 | | 1.67E+01 |
| + | PA-231 | 283.67 | | 1.60 | 1.43E+00 | 3.01E+00 | 4.12E+00 |
| | | 302.67 | | 2.30 | 1.62E+00 | | 3.01E+00 |
| + | TH-231 | 25.64 | | 14.70 | 2.27E+00 | 8.94E-01 | 2.95E+00 |
| | | 84.21 | | 6.40 | 7.06E-02 | | 8.94E-01 |
| + | PA-233 | 311.98 | | 38.60 | -7.11E-02 | 2.07E+00 | 2.07E+00 |
| + | PA-234 | 131.20 | | 20.40 | 6.65E-02 | 2.41E-01 | 2.41E-01 |
| | | 733.99 | | 8.80 | -8.23E-02 | | 8.80E-01 |
| | | 946.00 | | 12.00 | -2.88E-01 | | 7.75E-01 |
| + | PA-234M | 1001.03 | | 0.92 | 3.13E+00 | 1.07E+01 | 1.07E+01 |
| + | TH-234 | 63.29 | * | 3.80 | 1.77E+00 | 2.50E+00 | 2.50E+00 |
| + | U-235 | 143.76 | | 10.50 | -4.25E-02 | 4.58E-01 | 4.58E-01 |
| | | 163.35 | | 4.70 | 5.97E-01 | | 1.11E+00 |
| | | 205.31 | | 4.70 | -3.30E-01 | | 1.39E+00 |
| + | NP-237 | 86.50 | | 12.60 | 5.11E-01 | 4.83E-01 | 4.83E-01 |
| + | NP-239 | 106.10 | | 22.70 | -4.51E+11 | 9.56E+11 | 9.56E+11 |
| | | 228.18 | | 10.70 | 8.21E+11 | | 2.88E+12 |
| | | 277.60 | | 14.10 | 1.43E+12 | | 2.25E+12 |
| + | AM-241 | 59.54 | | 35.90 | -3.17E-03 | 1.73E-01 | 1.73E-01 |
| + | AM-243 | 74.67 | * | 66.00 | 2.94E-01 | 1.71E-01 | 1.71E-01 |
| + | CM-243 | 209.75 | | 3.29 | 2.97E-01 | 4.76E-01 | 2.04E+00 |
| | | 228.14 | | 10.60 | 1.74E-01 | | 6.10E-01 |
| | | 277.60 | | 14.00 | 3.03E-01 | | 4.76E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 2.63E+00 | 2.63E+00 | 1.52E+00 | 1.25E+00 |
| + | NA-22 | 1274.54 | * | 99.94 | 2.20E-01 | 2.20E-01 | 1.73E-01 | 1.05E-01 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 0.00E+00 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 4.60E-02 | 4.60E-02 | 9.26E-03 | 1.72E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.52E+00 | 1.52E+00 | 2.10E+01 | 7.12E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 6.54E-02 | 6.54E-02 | 9.68E-03 | 3.20E-02 |
| | | 78.34 | | 96.00 | 7.93E-02 | | 2.06E-01 | 3.90E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.88E-01 | 1.88E-01 | -6.10E-02 | 8.65E-02 |
| | | 1120.51 | | 99.99 | 3.29E-01 | | 3.05E-01 | 1.56E-01 |
| | V-48 | 983.52 | | 99.98 | 7.25E+00 | 5.39E+00 | 7.21E-01 | 3.36E+00 |
| | | 1312.10 | | 97.50 | 5.39E+00 | | -1.85E+00 | 2.35E+00 |
| | CR-51 | 320.08 | | 9.83 | 7.92E+00 | 7.92E+00 | 2.62E+00 | 3.80E+00 |
| | MN-54 | 834.83 | | 99.97 | 1.12E-01 | 1.12E-01 | 7.19E-02 | 5.20E-02 |
| | CO-56 | 846.75 | | 99.96 | 2.23E-01 | 2.23E-01 | 9.74E-02 | 1.04E-01 |
| | | 1037.75 | | 14.03 | 1.72E+00 | | 1.92E-01 | 7.96E-01 |
| | | 1238.25 | | 67.00 | 4.81E-01 | | 1.50E-01 | 2.25E-01 |
| | | 1771.40 | | 15.51 | 1.26E+00 | | 4.54E-02 | 5.44E-01 |
| | | 2598.48 | | 16.90 | 8.15E-01 | | 2.27E-01 | 3.05E-01 |
| | CO-57 | 122.06 | | 85.51 | 6.81E-02 | 6.81E-02 | -5.77E-02 | 3.31E-02 |
| | | 136.48 | | 10.60 | 5.51E-01 | | -4.35E-02 | 2.67E-01 |
| | CO-58 | 810.76 | | 99.40 | 2.21E-01 | 2.21E-01 | -7.94E-02 | 1.03E-01 |
| | FE-59 | 1099.22 | | 56.50 | 8.89E-01 | 8.89E-01 | 0.00E+00 | 4.13E-01 |
| | | 1291.56 | | 43.20 | 1.03E+00 | | 5.11E-01 | 4.67E-01 |
| | CO-60 | 1173.22 | | 100.00 | 1.33E-01 | 1.04E-01 | 1.14E-01 | 6.24E-02 |
| | | 1332.49 | | 100.00 | 1.04E-01 | | 3.32E-02 | 4.73E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 2.77E-01 | 2.77E-01 | 2.91E-02 | 1.28E-01 |
| | GA-67 | 93.31 | | 35.70 | 2.44E+08 | 2.44E+08 | 4.96E+08 | 1.20E+08 |
| | | 208.95 | | 2.24 | 4.29E+09 | | 1.58E+09 | 2.09E+09 |
| | | 300.22 | | 16.00 | 6.72E+08 | | -2.93E+08 | 3.25E+08 |
| | SE-75 | 121.11 | | 16.70 | 4.85E-01 | 1.40E-01 | -1.29E-01 | 2.36E-01 |
| | | 136.00 | | 59.20 | 1.40E-01 | | 3.24E-02 | 6.81E-02 |
| | | 264.65 | | 59.80 | 1.91E-01 | | 1.98E-03 | 9.21E-02 |
| | | 279.53 | | 25.20 | 4.69E-01 | | 1.32E-02 | 2.26E-01 |
| | | 400.65 | | 11.40 | 1.03E+00 | | -3.88E-01 | 4.90E-01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | RB-82 | 776.52 | | 13.00 | 9.73E+00 | 9.73E+00 | 7.21E-01 | 4.54E+00 |
| | RB-83 | 520.41 | | 46.00 | 3.88E-01 | 3.88E-01 | 4.69E-02 | 1.84E-01 |
| | | 529.64 | | 30.30 | 5.44E-01 | | -1.39E-01 | 2.57E-01 |
| | | 552.65 | | 16.40 | 9.64E-01 | | 1.12E-01 | 4.53E-01 |
| | KR-85 | 513.99 | | 0.43 | 2.21E+01 | 2.21E+01 | 3.82E+00 | 1.06E+01 |
| | SR-85 | 513.99 | | 99.27 | 2.74E-01 | 2.74E-01 | 4.73E-02 | 1.31E-01 |
| | Y-88 | 898.02 | | 93.40 | 1.84E-01 | 1.38E-01 | -4.83E-03 | 8.55E-02 |
| | | 1836.01 | | 99.38 | 1.38E-01 | | -1.75E-02 | 5.77E-02 |
| | MO-93 | 263.06 | | 56.72 | 1.13E-01 | 7.82E-02 | -8.73E-03 | 5.45E-02 |
| | | 684.67 | | 99.68 | 7.82E-02 | | -6.15E-04 | 3.65E-02 |
| | | 1477.11 | | 99.08 | 8.22E-02 | | 1.15E-02 | 3.60E-02 |
| | NB-93M | 16.57 | | 9.43 | 6.92E+01 | 6.92E+01 | 2.00E+01 | 3.37E+01 |
| | NB-94 | 702.63 | | 100.00 | 8.64E-02 | 8.64E-02 | 1.45E-02 | 4.06E-02 |
| | | 871.10 | | 100.00 | 9.36E-02 | | 5.01E-02 | 4.36E-02 |
| | NB-95 | 765.79 | | 99.81 | 6.94E-01 | 6.94E-01 | 2.37E-01 | 3.27E-01 |
| | NB-95M | 235.69 | | 25.00 | 7.32E+07 | 7.32E+07 | 3.21E+07 | 3.58E+07 |
| | ZR-95 | 724.18 | | 43.70 | 6.28E-01 | 4.50E-01 | 1.76E-01 | 2.96E-01 |
| | | 756.72 | | 55.30 | 4.50E-01 | | 1.29E-03 | 2.10E-01 |
| | MO-99 | 181.06 | | 6.20 | 6.23E+10 | 4.83E+10 | 2.66E+10 | 3.02E+10 |
| | | 739.58 | | 12.80 | 4.83E+10 | | 9.23E+09 | 2.26E+10 |
| | | 778.00 | | 4.50 | 1.31E+11 | | -3.50E+10 | 6.10E+10 |
| | RU-103 | 497.08 | | 89.00 | 4.89E-01 | 4.89E-01 | 8.22E-02 | 2.32E-01 |
| | RU-106 | 621.84 | | 9.80 | 9.24E-01 | 9.24E-01 | 3.20E-01 | 4.33E-01 |
| | AG-108M | 433.93 | | 89.90 | 7.79E-02 | 7.79E-02 | -3.58E-02 | 3.71E-02 |
| | | 614.37 | | 90.40 | 1.11E-01 | | 1.05E-02 | 5.31E-02 |
| | | 722.95 | | 90.50 | 9.22E-02 | | 2.01E-02 | 4.31E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 1.87E+00 | 1.87E+00 | 1.51E+00 | 9.16E-01 |
| | AG-110M | 657.75 | | 93.14 | 1.29E-01 | 1.29E-01 | 1.20E-02 | 6.09E-02 |
| | | 677.61 | | 10.53 | 1.01E+00 | | 3.74E-01 | 4.76E-01 |
| | | 706.67 | | 16.46 | 6.78E-01 | | 1.85E-01 | 3.18E-01 |
| | | 763.93 | | 21.98 | 5.14E-01 | | -2.83E-01 | 2.40E-01 |
| | | 884.67 | | 71.63 | 1.68E-01 | | 4.68E-02 | 7.81E-02 |
| | | 1384.27 | | 23.94 | 4.29E-01 | | -1.57E-02 | 1.89E-01 |
| | CD-113M | 263.70 | | 0.02 | 2.81E+02 | 2.81E+02 | -5.44E+00 | 1.36E+02 |
| | SN-113 | 255.12 | | 1.93 | 5.68E+00 | 1.98E-01 | 1.54E+00 | 2.74E+00 |
| | | 391.69 | | 64.90 | 1.98E-01 | | -3.71E-02 | 9.46E-02 |
| | TE123M | 159.00 | | 84.10 | 1.03E-01 | 1.03E-01 | -5.61E-02 | 4.98E-02 |
| | SB-124 | 602.71 | | 97.87 | 2.38E-01 | 2.38E-01 | -9.61E-03 | 1.12E-01 |
| | | 645.85 | | 7.26 | 3.48E+00 | | -2.24E-01 | 1.63E+00 |
| | | 722.78 | | 11.10 | 2.35E+00 | | 5.13E-01 | 1.10E+00 |
| | | 1691.02 | | 49.00 | 4.12E-01 | | -2.60E-02 | 1.71E-01 |
| | I-125 | 35.49 | | 6.49 | 5.90E+00 | 5.90E+00 | -5.53E+00 | 2.87E+00 |
| | SB-125 | 176.33 | | 6.89 | 8.12E-01 | 2.73E-01 | 1.72E-01 | 3.93E-01 |
| | | 427.89 | | 29.33 | 2.73E-01 | | 7.91E-02 | 1.31E-01 |
| | | 463.38 | | 10.35 | 8.40E-01 | | 6.92E-01 | 4.01E-01 |
| | | 600.56 | | 17.80 | 4.48E-01 | | -2.28E-02 | 2.10E-01 |
| | | 635.90 | | 11.32 | 6.28E-01 | | -5.14E-01 | 2.92E-01 |
| | SB-126 | 414.70 | | 83.30 | 2.14E+01 | 2.14E+01 | -1.90E+00 | 1.02E+01 |
| | | 666.33 | | 99.60 | 2.37E+01 | | -6.91E+00 | 1.12E+01 |
| | | 695.00 | | 99.60 | 2.30E+01 | | 7.98E+00 | 1.08E+01 |
| | | 720.50 | | 53.80 | 4.00E+01 | | 1.43E+01 | 1.87E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 1.62E-01 | 1.62E-01 | 1.31E-01 | 7.94E-02 |
| | SB-127 | 473.00 | | 25.00 | 1.52E+07 | 1.23E+07 | -5.00E+06 | 7.17E+06 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| SB-127 | 685.20 | 35.70 | 1.23E+07 | 1.23E+07 | -9.64E+04 | 5.72E+06 |
| | 783.80 | 14.70 | 3.88E+07 | | 3.40E+07 | 1.83E+07 |
| I-129 | 29.78 | 57.00 | 3.84E-01 | 3.84E-01 | -1.81E-01 | 1.87E-01 |
| | 33.60 | 13.20 | 1.13E+00 | | 8.53E-01 | 5.50E-01 |
| | 39.58 | 7.52 | 1.29E+00 | | 4.83E-01 | 6.27E-01 |
| I-131 | 284.30 | 6.05 | 5.70E+03 | 4.25E+02 | 2.60E+03 | 2.75E+03 |
| | 364.48 | 81.20 | 4.25E+02 | | 1.29E+02 | 2.03E+02 |
| | 636.97 | 7.26 | 4.94E+03 | | -3.15E+03 | 2.30E+03 |
| | 722.89 | 1.80 | 2.40E+04 | | 5.23E+03 | 1.12E+04 |
| TE-132 | 49.72 | 13.10 | 7.78E+08 | 1.07E+08 | -7.20E+08 | 3.80E+08 |
| | 228.16 | 88.00 | 1.07E+08 | | 3.04E+07 | 5.17E+07 |
| BA-133 | 81.00 | 33.00 | 1.74E-01 | 1.69E-01 | -6.45E-01 | 8.51E-02 |
| | 302.84 | 17.80 | 3.96E-01 | | 2.13E-01 | 1.91E-01 |
| | 356.01 | 60.00 | 1.69E-01 | | 2.00E-01 | 8.21E-02 |
| @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| XE-133 | 81.00 | 38.00 | 7.36E+04 | 7.36E+04 | -2.73E+05 | 3.60E+04 |
| CS-134 | 563.23 | 8.38 | 9.09E-01 | 1.03E-01 | -6.75E-01 | 4.26E-01 |
| | 569.32 | 15.43 | 5.68E-01 | | 1.33E-01 | 2.69E-01 |
| | 604.70 | 97.60 | 1.03E-01 | | -1.27E-02 | 4.88E-02 |
| | 795.84 | 85.40 | 1.31E-01 | | 7.77E-02 | 6.16E-02 |
| | 801.93 | 8.73 | 1.06E+00 | | -3.55E-01 | 4.93E-01 |
| CS-135 | 268.24 | 16.00 | 4.46E-01 | 4.46E-01 | 2.28E-01 | 2.16E-01 |
| @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CS-136 | 153.22 | 7.46 | 1.29E+02 | 1.62E+01 | 7.10E+01 | 6.26E+01 |
| | 163.89 | 4.61 | 2.11E+02 | | 1.13E+02 | 1.03E+02 |
| | 176.55 | 13.56 | 7.17E+01 | | 1.52E+01 | 3.47E+01 |
| | 273.65 | 12.66 | 1.01E+02 | | 1.45E-02 | 4.90E+01 |
| | 340.57 | 48.50 | 3.25E+01 | | 3.41E+00 | 1.57E+01 |
| | 818.50 | 99.70 | 1.62E+01 | | 3.52E+00 | 7.52E+00 |
| | 1048.07 | 79.60 | 2.25E+01 | | -6.43E-01 | 1.04E+01 |
| | 1235.34 | 19.70 | 1.39E+02 | | 7.85E+01 | 6.55E+01 |
| CS-137 | 661.65 | 85.12 | 1.27E-01 | 1.27E-01 | 1.08E-01 | 6.04E-02 |
| LA-138 | 788.74 | 34.00 | 2.52E-01 | 1.12E-01 | -2.10E-01 | 1.18E-01 |
| | 1435.80 | 66.00 | 1.12E-01 | | -2.91E-02 | 4.88E-02 |
| CE-139 | 165.85 | 80.35 | 1.03E-01 | 1.03E-01 | 1.68E-02 | 4.99E-02 |
| BA-140 | 162.64 | 6.70 | 1.68E+02 | 5.90E+01 | 8.52E+01 | 8.17E+01 |
| | 304.84 | 4.50 | 3.14E+02 | | -1.37E+01 | 1.51E+02 |
| | 423.70 | 3.20 | 5.02E+02 | | -7.56E+01 | 2.40E+02 |
| | 437.55 | 2.00 | 8.08E+02 | | 9.57E+01 | 3.86E+02 |
| | 537.32 | 25.00 | 5.90E+01 | | -5.61E+01 | 2.77E+01 |
| LA-140 | 328.77 | 20.50 | 8.00E+01 | 2.16E+01 | 9.13E+01 | 3.86E+01 |
| | 487.03 | 45.50 | 3.30E+01 | | 2.77E+00 | 1.56E+01 |
| | 815.85 | 23.50 | 7.83E+01 | | 5.30E+00 | 3.64E+01 |
| | 1596.49 | 95.49 | 2.16E+01 | | -1.60E-01 | 9.60E+00 |
| CE-141 | 145.44 | 48.40 | 8.52E-01 | 8.52E-01 | 2.01E-01 | 4.14E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 5.51E-01 | 5.51E-01 | -1.46E-01 | 2.68E-01 |
| PM-144 | 476.78 | 42.00 | 2.11E-01 | 9.49E-02 | 1.06E-02 | 1.00E-01 |
| | 618.01 | 98.60 | 9.49E-02 | | 2.67E-02 | 4.46E-02 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| PM-144 | 696.49 | 99.49 | 1.05E-01 | 9.49E-02 | -1.23E-02 | 4.92E-02 |
| PM-145 | 36.85 | 21.70 | 5.21E-01 | 2.76E-01 | 7.37E-02 | 2.54E-01 |
| | 37.36 | 39.70 | 2.76E-01 | | -1.24E-02 | 1.34E-01 |
| | 42.30 | 15.10 | 5.85E-01 | | 7.68E-02 | 2.85E-01 |
| | 72.40 | 2.31 | 2.98E+00 | | -5.11E+00 | 1.47E+00 |
| PM-146 | 453.90 | 39.94 | 1.83E-01 | 1.83E-01 | -9.50E-02 | 8.70E-02 |
| | 735.90 | 14.01 | 5.82E-01 | | -3.07E-01 | 2.71E-01 |
| | 747.13 | 13.10 | 6.50E-01 | | 1.97E-01 | 3.03E-01 |
| ND-147 | 91.11 | 28.90 | 1.08E+02 | 1.08E+02 | -1.08E+02 | 5.31E+01 |
| | 531.02 | 13.10 | 3.10E+02 | | 1.42E+02 | 1.47E+02 |
| PM-149 | 285.90 | 3.10 | 6.91E+13 | 6.91E+13 | 3.77E+13 | 3.33E+13 |
| EU-152 | 121.78 | 20.50 | 2.23E-01 | 2.23E-01 | -1.89E-01 | 1.08E-01 |
| | 244.69 | 5.40 | 1.44E+00 | | -2.20E+00 | 7.02E-01 |
| | 344.27 | 19.13 | 3.59E-01 | | 5.55E-02 | 1.72E-01 |
| | 778.89 | 9.20 | 9.07E-01 | | -2.07E-01 | 4.22E-01 |
| | 964.01 | 10.40 | 9.75E-01 | | -2.69E+00 | 4.54E-01 |
| | 1085.78 | 7.22 | 1.51E+00 | | 8.37E-01 | 7.00E-01 |
| | 1112.02 | 9.60 | 1.12E+00 | | 4.32E-01 | 5.18E-01 |
| | 1407.95 | 14.94 | 6.32E-01 | | 1.64E-01 | 2.84E-01 |
| GD-153 | 97.43 | 31.30 | 2.01E-01 | 2.01E-01 | 5.44E-02 | 9.77E-02 |
| | 103.18 | 22.20 | 2.78E-01 | | -4.55E-02 | 1.35E-01 |
| EU-154 | 123.07 | 40.50 | 1.18E-01 | 1.18E-01 | -4.64E-02 | 5.71E-02 |
| | 723.30 | 19.70 | 4.32E-01 | | 9.43E-02 | 2.02E-01 |
| | 873.19 | 11.50 | 7.96E-01 | | -1.32E-01 | 3.70E-01 |
| | 996.32 | 10.30 | 9.56E-01 | | -1.16E-01 | 4.43E-01 |
| | 1004.76 | 17.90 | 5.45E-01 | | 1.53E-01 | 2.52E-01 |
| | 1274.45 | 35.50 | 3.30E-01 | | -1.62E-01 | 1.52E-01 |
| EU-155 | 86.50 | 30.90 | 2.05E-01 | 2.05E-01 | 2.17E-01 | 1.00E-01 |
| | 105.30 | 20.70 | 2.27E-01 | | -1.07E-01 | 1.10E-01 |
| EU-156 | 811.77 | 10.40 | 7.23E+01 | 7.23E+01 | -3.93E+01 | 3.35E+01 |
| | 1153.47 | 7.20 | 1.40E+02 | | -5.28E+00 | 6.50E+01 |
| | 1230.71 | 8.90 | 1.41E+02 | | 1.71E+01 | 6.60E+01 |
| HO-166M | 184.41 | 72.60 | 8.77E-02 | 8.77E-02 | 1.09E-01 | 4.27E-02 |
| | 280.45 | 29.60 | 2.20E-01 | | 2.20E-02 | 1.06E-01 |
| | 410.94 | 11.10 | 6.69E-01 | | 8.89E-02 | 3.20E-01 |
| | 711.69 | 54.10 | 1.45E-01 | | 2.03E-02 | 6.74E-02 |
| TM-171 | 66.72 | 0.14 | 5.02E+01 | 5.02E+01 | 1.19E+01 | 2.46E+01 |
| HF-172 | 67.35 | 5.31 | 1.29E+00 | 4.85E-01 | 1.91E-01 | 6.31E-01 |
| | 125.81 | 11.30 | 4.85E-01 | | 1.30E-01 | 2.36E-01 |
| LU-172 | 181.53 | 20.60 | 7.27E+03 | 4.79E+03 | 1.00E+03 | 3.52E+03 |
| | 900.72 | 29.81 | 8.63E+03 | | 4.22E+02 | 4.00E+03 |
| | 1093.66 | 62.50 | 4.79E+03 | | 1.95E+03 | 2.22E+03 |
| LU-173 | 100.72 | 5.24 | 1.06E+00 | 3.80E-01 | 8.06E-01 | 5.17E-01 |
| | 272.11 | 21.20 | 3.80E-01 | | 1.15E-01 | 1.84E-01 |
| HF-175 | 343.40 | 84.00 | 2.15E-01 | 2.15E-01 | 3.32E-02 | 1.03E-01 |
| LU-176 | 88.34 | 13.30 | 4.55E-01 | 6.32E-02 | -8.05E-02 | 2.23E-01 |
| | 201.83 | 86.00 | 6.32E-02 | | -1.15E-02 | 3.06E-02 |
| | 306.78 | 94.00 | 6.73E-02 | | -6.36E-03 | 3.23E-02 |
| HF-181 | 133.02 | 41.70 | 5.79E-01 | 4.47E-01 | -6.91E-02 | 2.81E-01 |
| | 345.85 | 17.20 | 2.05E+00 | | 2.27E-01 | 9.82E-01 |
| | 482.03 | 82.80 | 4.47E-01 | | 2.33E-02 | 2.12E-01 |
| TA-182 | 67.75 | 41.20 | 2.73E-01 | 2.73E-01 | 4.04E-02 | 1.34E-01 |
| | 1121.30 | 34.90 | 7.61E-01 | | 7.64E-01 | 3.60E-01 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TA-182 | 1189.05 | | 16.23 | 1.27E+00 | 2.73E-01 | -4.99E-01 | 5.89E-01 |
| | | 1221.41 | | 26.98 | 8.34E-01 | | -2.15E-02 | 3.88E-01 |
| | | 1231.02 | | 11.44 | 2.16E+00 | | 2.63E-01 | 1.01E+00 |
| | IR-192 | 308.46 | | 29.68 | 5.22E-01 | 3.51E-01 | -3.47E-01 | 2.51E-01 |
| | | 468.07 | | 48.10 | 3.51E-01 | | 5.48E-02 | 1.66E-01 |
| | HG-203 | 279.19 | | 77.30 | 3.74E-01 | 3.74E-01 | 9.66E-02 | 1.81E-01 |
| | TL-204 | 374.74 | | 94.11 | 7.31E-02 | 7.31E-02 | -3.17E-02 | 3.49E-02 |
| | | 899.15 | | 99.16 | 9.26E-02 | | -4.53E-02 | 4.29E-02 |
| | | 911.74 | | 91.10 | 1.76E-01 | | 2.49E-01 | 8.41E-02 |
| | BI-207 | 569.67 | | 97.72 | 8.54E-02 | 8.54E-02 | 5.28E-02 | 4.05E-02 |
| | | 1063.62 | | 74.90 | 1.31E-01 | | -1.12E-02 | 6.03E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 3.86E-01 | 2.76E-01 | 9.30E-01 | 1.86E-01 |
| | | 860.37 | * | 4.48 | 2.49E+00 | | 3.21E+00 | 1.18E+00 |
| | | 2614.66 | * | 35.85 | 2.76E-01 | | 9.49E-01 | 1.18E-01 |
| | BI-210M | 262.00 | | 45.00 | 1.36E-01 | 1.36E-01 | -5.89E-02 | 6.55E-02 |
| | | 300.00 | | 23.00 | 3.25E-01 | | -1.42E-01 | 1.57E-01 |
| | PB-210 | 46.50 | | 4.25 | 1.93E+00 | 1.93E+00 | 2.00E+00 | 9.45E-01 |
| | PB-211 | 404.84 | | 2.90 | 2.46E+00 | 2.46E+00 | -3.09E-01 | 1.18E+00 |
| | | 831.96 | | 2.90 | 2.61E+00 | | -8.07E-01 | 1.20E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 8.26E-01 | 8.26E-01 | 8.11E-01 | 3.90E-01 |
| | | 1620.62 | | 2.75 | 3.13E+00 | | 1.49E+00 | 1.37E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 2.61E-01 | 2.61E-01 | 1.16E+00 | 1.28E-01 |
| | | 300.09 | | 3.41 | 2.19E+00 | | -9.57E-01 | 1.06E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 2.27E-01 | 2.27E-01 | 1.24E+00 | 1.09E-01 |
| | | 1120.29 | * | 15.10 | 1.02E+00 | | 8.30E-01 | 4.86E-01 |
| | | 1764.49 | * | 15.80 | 6.16E-01 | | 1.26E+00 | 2.72E-01 |
| | | 2204.22 | * | 4.98 | 2.55E+00 | | 1.59E+00 | 1.14E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 3.77E-01 | 3.41E-01 | 1.55E+00 | 1.82E-01 |
| | | 351.92 | * | 37.19 | 3.41E-01 | | 1.53E+00 | 1.67E-01 |
| | RN-219 | 401.80 | | 6.50 | 1.04E+00 | 1.04E+00 | -1.66E-01 | 4.96E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.71E+00 | 1.71E+00 | 2.20E-01 | 8.23E-01 |
| | RA-224 | 240.98 | | 3.95 | 3.12E+00 | 3.12E+00 | 1.62E+01 | 1.54E+00 |
| | RA-225 | 40.00 | | 31.00 | 3.18E+01 | 3.18E+01 | 1.19E+01 | 1.55E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.27E+00 | 2.27E+00 | 2.50E+00 | 1.11E+00 |
| | TH-227 | 50.10 | | 8.40 | 8.21E-01 | 8.21E-01 | -7.60E-01 | 4.01E-01 |
| | | 236.00 | | 11.50 | 8.51E-01 | | 3.73E-01 | 4.17E-01 |
| | | 256.20 | | 6.30 | 9.43E-01 | | -4.37E-02 | 4.54E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 6.79E-01 | 5.86E-01 | 1.01E+00 | 3.27E-01 |
| | | 911.07 | * | 27.70 | 5.86E-01 | | 8.89E-01 | 2.81E-01 |
| | | 969.11 | * | 16.60 | 1.40E+00 | | 1.48E+00 | 6.81E-01 |
| | TH-230 | 48.44 | | 16.90 | 4.50E-01 | 4.50E-01 | 3.73E-01 | 2.20E-01 |
| | | 62.85 | | 4.60 | 1.50E+00 | | 1.60E+00 | 7.37E-01 |
| | | 67.67 | | 0.37 | 1.67E+01 | | 2.47E+00 | 8.16E+00 |
| | PA-231 | 283.67 | | 1.60 | 4.12E+00 | 3.01E+00 | 1.43E+00 | 1.99E+00 |
| | | 302.67 | | 2.30 | 3.01E+00 | | 1.62E+00 | 1.45E+00 |
| | TH-231 | 25.64 | | 14.70 | 2.95E+00 | 8.94E-01 | 2.27E+00 | 1.44E+00 |
| | | 84.21 | | 6.40 | 8.94E-01 | | 7.06E-02 | 4.38E-01 |
| | PA-233 | 311.98 | | 38.60 | 2.07E+00 | 2.07E+00 | -7.11E-02 | 9.94E-01 |
| | PA-234 | 131.20 | | 20.40 | 2.41E-01 | 2.41E-01 | 6.65E-02 | 1.17E-01 |
| | | 733.99 | | 8.80 | 8.80E-01 | | -8.23E-02 | 4.09E-01 |
| | | 946.00 | | 12.00 | 7.75E-01 | | -2.88E-01 | 3.59E-01 |
| | PA-234M | 1001.03 | | 0.92 | 1.07E+01 | 1.07E+01 | 3.13E+00 | 4.96E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 2.50E+00 | 2.50E+00 | 1.77E+00 | 1.23E+00 |

Analysis Report for 1707087-08

HTC-A03-S002-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | U-235 | 143.76 | | 10.50 | 4.58E-01 | 4.58E-01 | -4.25E-02 | 2.22E-01 |
| | | 163.35 | | 4.70 | 1.11E+00 | | 5.97E-01 | 5.41E-01 |
| | | 205.31 | | 4.70 | 1.39E+00 | | -3.30E-01 | 6.76E-01 |
| | NP-237 | 86.50 | | 12.60 | 4.83E-01 | 4.83E-01 | 5.11E-01 | 2.37E-01 |
| | NP-239 | 106.10 | | 22.70 | 9.56E+11 | 9.56E+11 | -4.51E+11 | 4.65E+11 |
| | | 228.18 | | 10.70 | 2.88E+12 | | 8.21E+11 | 1.39E+12 |
| | | 277.60 | | 14.10 | 2.25E+12 | | 1.43E+12 | 1.09E+12 |
| | AM-241 | 59.54 | | 35.90 | 1.73E-01 | 1.73E-01 | -3.17E-03 | 8.45E-02 |
| + | AM-243 | 74.67 | * | 66.00 | 1.71E-01 | 1.71E-01 | 2.94E-01 | 8.43E-02 |
| | CM-243 | 209.75 | | 3.29 | 2.04E+00 | 4.76E-01 | 2.97E-01 | 9.92E-01 |
| | | 228.14 | | 10.60 | 6.10E-01 | | 1.74E-01 | 2.96E-01 |
| | | 277.60 | | 14.00 | 4.76E-01 | | 3.03E-01 | 2.30E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-2430-01

Elapsed Live time: 3600
Elapsed Real Time: 3608

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 1 | 158 | 170 | 121 | 139 | 113 | 116 | 110 |
| 17: | 95 | 97 | 87 | 84 | 82 | 72 | 94 | 103 |
| 25: | 103 | 109 | 85 | 104 | 78 | 100 | 74 | 83 |
| 33: | 112 | 83 | 79 | 99 | 77 | 79 | 95 | 83 |
| 41: | 93 | 105 | 88 | 98 | 107 | 104 | 155 | 148 |
| 49: | 91 | 96 | 107 | 98 | 113 | 124 | 103 | 125 |
| 57: | 116 | 110 | 130 | 123 | 135 | 143 | 196 | 215 |
| 65: | 182 | 161 | 136 | 163 | 153 | 144 | 152 | 150 |
| 73: | 170 | 197 | 319 | 321 | 359 | 439 | 239 | 124 |
| 81: | 126 | 106 | 116 | 152 | 163 | 133 | 176 | 217 |
| 89: | 153 | 156 | 130 | 145 | 224 | 230 | 135 | 96 |
| 97: | 81 | 104 | 101 | 111 | 99 | 100 | 102 | 79 |
| 105: | 85 | 85 | 96 | 91 | 102 | 85 | 81 | 82 |
| 113: | 86 | 78 | 98 | 89 | 92 | 83 | 95 | 62 |
| 121: | 87 | 69 | 90 | 84 | 85 | 112 | 86 | 95 |
| 129: | 91 | 93 | 94 | 85 | 72 | 87 | 65 | 77 |
| 137: | 78 | 72 | 62 | 72 | 63 | 83 | 63 | 86 |
| 145: | 64 | 81 | 93 | 74 | 87 | 66 | 81 | 82 |
| 153: | 75 | 91 | 75 | 74 | 58 | 64 | 69 | 78 |
| 161: | 71 | 86 | 74 | 80 | 69 | 72 | 52 | 70 |
| 169: | 64 | 50 | 72 | 80 | 59 | 64 | 62 | 78 |
| 177: | 59 | 64 | 78 | 71 | 62 | 72 | 66 | 56 |
| 185: | 88 | 132 | 137 | 87 | 58 | 68 | 61 | 83 |
| 193: | 56 | 54 | 55 | 67 | 50 | 62 | 62 | 64 |
| 201: | 68 | 61 | 49 | 59 | 64 | 64 | 64 | 54 |
| 209: | 74 | 64 | 65 | 52 | 59 | 49 | 64 | 49 |
| 217: | 54 | 46 | 58 | 60 | 56 | 45 | 44 | 43 |
| 225: | 51 | 47 | 53 | 44 | 54 | 48 | 51 | 47 |
| 233: | 49 | 37 | 52 | 58 | 71 | 142 | 372 | 305 |
| 241: | 101 | 122 | 115 | 51 | 48 | 40 | 38 | 33 |
| 249: | 43 | 33 | 38 | 40 | 37 | 41 | 27 | 31 |
| 257: | 43 | 34 | 30 | 33 | 32 | 32 | 40 | 48 |
| 265: | 33 | 44 | 39 | 34 | 41 | 59 | 78 | 44 |
| 273: | 30 | 26 | 32 | 33 | 53 | 40 | 35 | 39 |
| 281: | 32 | 29 | 36 | 40 | 41 | 30 | 44 | 36 |
| 289: | 33 | 33 | 30 | 27 | 32 | 54 | 126 | 188 |
| 297: | 84 | 29 | 32 | 43 | 45 | 36 | 27 | 38 |
| 305: | 34 | 25 | 29 | 29 | 28 | 18 | 27 | 30 |
| 313: | 33 | 28 | 27 | 21 | 32 | 22 | 29 | 27 |
| 321: | 37 | 23 | 27 | 23 | 26 | 26 | 40 | 42 |
| 329: | 44 | 36 | 27 | 43 | 26 | 22 | 31 | 31 |
| 337: | 25 | 60 | 92 | 42 | 19 | 34 | 29 | 28 |
| 345: | 27 | 25 | 25 | 31 | 31 | 30 | 80 | 223 |
| 353: | 215 | 68 | 29 | 25 | 22 | 18 | 15 | 16 |
| 361: | 18 | 19 | 25 | 27 | 21 | 21 | 17 | 33 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 25 | 22 | 23 | 17 | 21 | 18 | 25 | 25 |

Sample Title: HTC-A03-S002-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 19 | 24 | 27 | 27 | 22 | 21 | 21 | 25 |
| 385: | 21 | 21 | 24 | 30 | 27 | 23 | 24 | 17 |
| 393: | 24 | 28 | 18 | 27 | 19 | 16 | 19 | 19 |
| 401: | 17 | 20 | 14 | 29 | 22 | 21 | 28 | 21 |
| 409: | 32 | 23 | 25 | 22 | 23 | 17 | 24 | 17 |
| 417: | 21 | 16 | 13 | 24 | 23 | 22 | 17 | 22 |
| 425: | 26 | 21 | 23 | 25 | 29 | 16 | 14 | 16 |
| 433: | 23 | 17 | 13 | 27 | 20 | 24 | 20 | 23 |
| 441: | 20 | 25 | 15 | 22 | 19 | 14 | 16 | 22 |
| 449: | 24 | 15 | 10 | 24 | 13 | 13 | 19 | 28 |
| 457: | 15 | 26 | 10 | 15 | 12 | 24 | 33 | 45 |
| 465: | 20 | 15 | 8 | 16 | 18 | 12 | 13 | 15 |
| 473: | 12 | 17 | 15 | 15 | 13 | 19 | 22 | 19 |
| 481: | 25 | 14 | 12 | 14 | 11 | 14 | 19 | 15 |
| 489: | 17 | 13 | 15 | 15 | 17 | 19 | 16 | 18 |
| 497: | 9 | 21 | 20 | 16 | 11 | 20 | 14 | 15 |
| 505: | 25 | 14 | 10 | 22 | 21 | 38 | 49 | 37 |
| 513: | 28 | 17 | 14 | 16 | 15 | 20 | 22 | 15 |
| 521: | 12 | 15 | 16 | 23 | 11 | 13 | 14 | 19 |
| 529: | 14 | 16 | 15 | 14 | 9 | 23 | 15 | 8 |
| 537: | 12 | 6 | 6 | 12 | 21 | 21 | 9 | 17 |
| 545: | 11 | 19 | 19 | 13 | 16 | 10 | 10 | 10 |
| 553: | 12 | 15 | 8 | 20 | 8 | 9 | 14 | 9 |
| 561: | 15 | 8 | 12 | 12 | 13 | 9 | 18 | 20 |
| 569: | 11 | 12 | 9 | 24 | 17 | 10 | 13 | 13 |
| 577: | 11 | 19 | 13 | 8 | 15 | 25 | 71 | 73 |
| 585: | 39 | 13 | 12 | 10 | 9 | 12 | 9 | 4 |
| 593: | 12 | 11 | 5 | 17 | 12 | 12 | 8 | 7 |
| 601: | 18 | 9 | 16 | 10 | 12 | 7 | 21 | 47 |
| 609: | 118 | 140 | 67 | 19 | 11 | 10 | 14 | 15 |
| 617: | 8 | 10 | 11 | 12 | 12 | 7 | 12 | 8 |
| 625: | 14 | 13 | 4 | 14 | 9 | 13 | 11 | 11 |
| 633: | 5 | 11 | 6 | 8 | 9 | 10 | 7 | 10 |
| 641: | 17 | 14 | 12 | 13 | 17 | 11 | 11 | 10 |
| 649: | 8 | 11 | 9 | 7 | 14 | 16 | 12 | 17 |
| 657: | 12 | 10 | 16 | 11 | 25 | 38 | 29 | 7 |
| 665: | 17 | 15 | 15 | 6 | 14 | 8 | 9 | 8 |
| 673: | 11 | 12 | 13 | 11 | 12 | 10 | 9 | 6 |
| 681: | 15 | 10 | 3 | 11 | 9 | 7 | 11 | 15 |
| 689: | 7 | 10 | 9 | 19 | 10 | 12 | 15 | 8 |
| 697: | 13 | 12 | 9 | 13 | 16 | 6 | 19 | 6 |
| 705: | 9 | 12 | 14 | 13 | 13 | 10 | 8 | 5 |
| 713: | 8 | 10 | 10 | 9 | 7 | 7 | 12 | 6 |
| 721: | 8 | 15 | 11 | 14 | 5 | 12 | 26 | 29 |
| 729: | 13 | 10 | 8 | 9 | 5 | 13 | 11 | 7 |
| 737: | 6 | 12 | 7 | 13 | 15 | 8 | 12 | 11 |
| 745: | 8 | 10 | 12 | 8 | 11 | 5 | 8 | 12 |
| 753: | 10 | 7 | 17 | 15 | 12 | 7 | 5 | 5 |
| 761: | 8 | 10 | 8 | 11 | 10 | 10 | 11 | 15 |
| 769: | 24 | 9 | 15 | 7 | 11 | 14 | 10 | 9 |
| 777: | 8 | 8 | 10 | 7 | 8 | 10 | 5 | 18 |
| 785: | 17 | 18 | 14 | 4 | 7 | 3 | 9 | 9 |
| 793: | 9 | 15 | 22 | 13 | 13 | 6 | 13 | 12 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 6 | 6 | 6 | 8 | 9 | 13 | 9 | 11 |

Sample Title: HTC-A03-S002-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 8 | 9 | 8 | 7 | 7 | 7 | 8 | 11 |
| 817: | 11 | 7 | 8 | 3 | 14 | 7 | 7 | 8 |
| 825: | 13 | 6 | 5 | 4 | 6 | 5 | 2 | 5 |
| 833: | 9 | 9 | 8 | 13 | 9 | 10 | 6 | 8 |
| 841: | 5 | 10 | 6 | 19 | 10 | 7 | 7 | 8 |
| 849: | 7 | 9 | 8 | 5 | 5 | 5 | 7 | 8 |
| 857: | 10 | 10 | 11 | 18 | 15 | 8 | 6 | 8 |
| 865: | 3 | 3 | 8 | 8 | 11 | 10 | 9 | 11 |
| 873: | 9 | 6 | 5 | 8 | 12 | 6 | 9 | 5 |
| 881: | 7 | 7 | 12 | 8 | 11 | 7 | 7 | 7 |
| 889: | 8 | 7 | 4 | 7 | 7 | 8 | 10 | 9 |
| 897: | 9 | 11 | 7 | 7 | 3 | 6 | 11 | 10 |
| 905: | 5 | 8 | 6 | 14 | 11 | 25 | 40 | 51 |
| 913: | 22 | 7 | 9 | 11 | 12 | 5 | 9 | 8 |
| 921: | 8 | 12 | 8 | 9 | 12 | 4 | 9 | 7 |
| 929: | 13 | 7 | 3 | 5 | 9 | 10 | 17 | 11 |
| 937: | 8 | 8 | 7 | 10 | 15 | 6 | 8 | 5 |
| 945: | 10 | 4 | 12 | 6 | 9 | 5 | 13 | 6 |
| 953: | 6 | 11 | 4 | 8 | 9 | 8 | 13 | 10 |
| 961: | 4 | 6 | 4 | 16 | 12 | 12 | 7 | 35 |
| 969: | 38 | 29 | 10 | 8 | 8 | 8 | 9 | 8 |
| 977: | 4 | 1 | 6 | 3 | 12 | 10 | 7 | 10 |
| 985: | 2 | 7 | 8 | 5 | 6 | 11 | 8 | 10 |
| 993: | 5 | 7 | 10 | 5 | 7 | 9 | 10 | 8 |
| 1001: | 7 | 8 | 6 | 7 | 2 | 11 | 12 | 5 |
| 1009: | 6 | 3 | 5 | 4 | 5 | 11 | 11 | 8 |
| 1017: | 5 | 8 | 11 | 5 | 4 | 4 | 4 | 5 |
| 1025: | 8 | 5 | 4 | 2 | 7 | 7 | 8 | 5 |
| 1033: | 6 | 11 | 5 | 12 | 6 | 5 | 9 | 7 |
| 1041: | 10 | 4 | 8 | 6 | 11 | 7 | 6 | 9 |
| 1049: | 3 | 6 | 6 | 6 | 8 | 9 | 7 | 5 |
| 1057: | 4 | 4 | 6 | 7 | 4 | 4 | 8 | 11 |
| 1065: | 8 | 3 | 10 | 5 | 11 | 7 | 2 | 5 |
| 1073: | 8 | 1 | 7 | 5 | 4 | 9 | 8 | 4 |
| 1081: | 2 | 6 | 13 | 4 | 5 | 9 | 7 | 12 |
| 1089: | 7 | 1 | 11 | 5 | 5 | 9 | 7 | 10 |
| 1097: | 6 | 8 | 5 | 9 | 9 | 9 | 8 | 8 |
| 1105: | 5 | 6 | 6 | 4 | 6 | 8 | 8 | 8 |
| 1113: | 6 | 8 | 9 | 7 | 5 | 10 | 14 | 29 |
| 1121: | 21 | 13 | 10 | 6 | 10 | 7 | 9 | 8 |
| 1129: | 6 | 5 | 7 | 5 | 6 | 10 | 3 | 6 |
| 1137: | 2 | 4 | 9 | 7 | 11 | 4 | 6 | 8 |
| 1145: | 1 | 8 | 8 | 8 | 6 | 3 | 9 | 5 |
| 1153: | 5 | 14 | 11 | 6 | 11 | 6 | 7 | 6 |
| 1161: | 7 | 13 | 6 | 11 | 8 | 8 | 15 | 3 |
| 1169: | 4 | 13 | 11 | 5 | 9 | 18 | 11 | 6 |
| 1177: | 7 | 6 | 7 | 11 | 5 | 13 | 8 | 14 |
| 1185: | 13 | 10 | 11 | 5 | 6 | 10 | 7 | 5 |
| 1193: | 10 | 5 | 11 | 8 | 5 | 9 | 5 | 7 |
| 1201: | 6 | 7 | 8 | 12 | 9 | 8 | 8 | 4 |
| 1209: | 14 | 10 | 4 | 7 | 11 | 7 | 9 | 13 |
| 1217: | 6 | 5 | 10 | 3 | 11 | 7 | 15 | 11 |
| 1225: | 7 | 10 | 11 | 9 | 5 | 10 | 13 | 16 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 14 | 8 | 8 | 11 | 19 | 13 | 9 | 5 |

Sample Title: HTC-A03-S002-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 8 | 10 | 4 | 9 | 11 | 5 | 10 | 7 |
| 1249: | 8 | 4 | 5 | 6 | 9 | 9 | 4 | 8 |
| 1257: | 9 | 11 | 5 | 7 | 3 | 5 | 6 | 3 |
| 1265: | 4 | 4 | 3 | 7 | 12 | 10 | 6 | 6 |
| 1273: | 3 | 7 | 7 | 12 | 8 | 7 | 9 | 3 |
| 1281: | 7 | 2 | 5 | 3 | 7 | 5 | 3 | 4 |
| 1289: | 5 | 1 | 4 | 2 | 10 | 6 | 0 | 2 |
| 1297: | 3 | 5 | 4 | 9 | 5 | 2 | 2 | 4 |
| 1305: | 6 | 5 | 7 | 4 | 2 | 1 | 2 | 1 |
| 1313: | 5 | 3 | 2 | 7 | 5 | 8 | 4 | 5 |
| 1321: | 2 | 3 | 1 | 6 | 2 | 2 | 6 | 1 |
| 1329: | 8 | 4 | 5 | 5 | 7 | 4 | 1 | 4 |
| 1337: | 3 | 5 | 7 | 4 | 4 | 3 | 4 | 2 |
| 1345: | 1 | 5 | 3 | 4 | 4 | 7 | 3 | 4 |
| 1353: | 1 | 2 | 1 | 4 | 3 | 5 | 2 | 1 |
| 1361: | 1 | 2 | 6 | 3 | 2 | 4 | 3 | 7 |
| 1369: | 1 | 7 | 1 | 1 | 2 | 2 | 2 | 6 |
| 1377: | 8 | 9 | 6 | 3 | 1 | 4 | 3 | 3 |
| 1385: | 2 | 4 | 1 | 1 | 6 | 0 | 4 | 2 |
| 1393: | 2 | 1 | 0 | 4 | 5 | 4 | 4 | 3 |
| 1401: | 6 | 4 | 5 | 3 | 5 | 1 | 8 | 6 |
| 1409: | 1 | 2 | 3 | 1 | 3 | 3 | 5 | 2 |
| 1417: | 4 | 3 | 2 | 3 | 2 | 2 | 3 | 3 |
| 1425: | 0 | 3 | 6 | 3 | 1 | 2 | 4 | 3 |
| 1433: | 2 | 1 | 4 | 3 | 2 | 1 | 2 | 2 |
| 1441: | 3 | 5 | 0 | 1 | 3 | 2 | 1 | 3 |
| 1449: | 2 | 4 | 1 | 2 | 2 | 1 | 6 | 4 |
| 1457: | 4 | 12 | 85 | 198 | 204 | 96 | 27 | 5 |
| 1465: | 4 | 4 | 2 | 3 | 6 | 3 | 0 | 0 |
| 1473: | 0 | 3 | 1 | 2 | 4 | 1 | 2 | 2 |
| 1481: | 2 | 4 | 2 | 3 | 1 | 1 | 1 | 1 |
| 1489: | 0 | 5 | 2 | 3 | 2 | 1 | 2 | 2 |
| 1497: | 4 | 3 | 1 | 1 | 3 | 1 | 2 | 1 |
| 1505: | 4 | 3 | 2 | 7 | 5 | 1 | 1 | 3 |
| 1513: | 2 | 3 | 2 | 2 | 5 | 1 | 0 | 0 |
| 1521: | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| 1529: | 1 | 1 | 2 | 2 | 1 | 4 | 4 | 5 |
| 1537: | 4 | 1 | 1 | 0 | 2 | 2 | 3 | 0 |
| 1545: | 1 | 1 | 3 | 2 | 1 | 2 | 0 | 2 |
| 1553: | 3 | 0 | 0 | 1 | 0 | 3 | 1 | 2 |
| 1561: | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 1 |
| 1569: | 1 | 1 | 0 | 2 | 1 | 2 | 1 | 2 |
| 1577: | 2 | 2 | 3 | 5 | 5 | 0 | 1 | 0 |
| 1585: | 3 | 2 | 5 | 6 | 7 | 4 | 4 | 5 |
| 1593: | 5 | 4 | 3 | 2 | 2 | 1 | 0 | 0 |
| 1601: | 2 | 2 | 2 | 0 | 0 | 2 | 4 | 1 |
| 1609: | 3 | 3 | 1 | 2 | 1 | 0 | 1 | 1 |
| 1617: | 1 | 1 | 2 | 2 | 2 | 3 | 2 | 3 |
| 1625: | 1 | 1 | 3 | 3 | 5 | 1 | 1 | 1 |
| 1633: | 3 | 0 | 0 | 0 | 0 | 2 | 1 | 2 |
| 1641: | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 1 |
| 1649: | 2 | 1 | 2 | 5 | 1 | 2 | 0 | 0 |
| 1657: | 1 | 3 | 3 | 2 | 0 | 2 | 0 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 3 | 1 | 2 | 2 | 1 | 0 | 1 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 2 | 2 | 0 | 1 | 0 | 0 | 1 | 0 |
| 1681: | 4 | 0 | 0 | 1 | 3 | 0 | 0 | 1 |
| 1689: | 0 | 2 | 0 | 3 | 1 | 0 | 1 | 0 |
| 1697: | 1 | 2 | 1 | 3 | 2 | 0 | 0 | 1 |
| 1705: | 0 | 1 | 0 | 3 | 0 | 2 | 0 | 0 |
| 1713: | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 |
| 1721: | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 3 |
| 1729: | 7 | 2 | 2 | 0 | 0 | 0 | 1 | 2 |
| 1737: | 0 | 0 | 3 | 1 | 1 | 2 | 1 | 2 |
| 1745: | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1753: | 1 | 0 | 3 | 4 | 1 | 0 | 3 | 0 |
| 1761: | 2 | 4 | 12 | 19 | 12 | 5 | 6 | 2 |
| 1769: | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 1777: | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 1 |
| 1785: | 0 | 0 | 0 | 2 | 0 | 1 | 2 | 0 |
| 1793: | 2 | 1 | 0 | 1 | 0 | 2 | 1 | 2 |
| 1801: | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 0 |
| 1809: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1817: | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 1 |
| 1825: | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 0 |
| 1833: | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 2 |
| 1841: | 3 | 0 | 1 | 0 | 2 | 4 | 7 | 5 |
| 1849: | 2 | 1 | 0 | 0 | 2 | 0 | 1 | 0 |
| 1857: | 3 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 1865: | 0 | 0 | 2 | 1 | 1 | 0 | 1 | 2 |
| 1873: | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 1 |
| 1881: | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 2 |
| 1889: | 2 | 5 | 2 | 0 | 0 | 1 | 2 | 1 |
| 1897: | 1 | 1 | 0 | 0 | 2 | 4 | 0 | 0 |
| 1905: | 0 | 1 | 4 | 1 | 2 | 0 | 0 | 3 |
| 1913: | 0 | 2 | 0 | 0 | 2 | 1 | 1 | 1 |
| 1921: | 0 | 0 | 2 | 1 | 2 | 1 | 0 | 2 |
| 1929: | 0 | 3 | 1 | 0 | 1 | 0 | 2 | 1 |
| 1937: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 1945: | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1953: | 0 | 0 | 2 | 0 | 1 | 4 | 2 | 1 |
| 1961: | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 1969: | 0 | 0 | 1 | 2 | 2 | 1 | 0 | 1 |
| 1977: | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 1985: | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 |
| 1993: | 1 | 2 | 0 | 2 | 1 | 1 | 1 | 1 |
| 2001: | 2 | 2 | 0 | 2 | 0 | 1 | 1 | 1 |
| 2009: | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 2017: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| 2025: | 1 | 2 | 2 | 0 | 2 | 0 | 0 | 0 |
| 2033: | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 2041: | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 |
| 2049: | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 1 |
| 2057: | 2 | 1 | 0 | 0 | 2 | 2 | 0 | 1 |
| 2065: | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2073: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2081: | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2089: | 1 | 1 | 1 | 0 | 1 | 2 | 2 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 2 | 0 | 0 | 2 | 2 | 3 | 4 | 3 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 2113: | 1 | 0 | 1 | 0 | 4 | 6 | 3 | 0 |
| 2121: | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 0 |
| 2129: | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 0 |
| 2137: | 0 | 1 | 0 | 2 | 0 | 1 | 2 | 0 |
| 2145: | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 0 |
| 2153: | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2161: | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 0 |
| 2169: | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 1 |
| 2177: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2185: | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 |
| 2193: | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2201: | 2 | 3 | 10 | 5 | 5 | 2 | 0 | 4 |
| 2209: | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 2217: | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2225: | 1 | 3 | 0 | 0 | 2 | 1 | 1 | 0 |
| 2233: | 0 | 2 | 0 | 0 | 1 | 4 | 1 | 0 |
| 2241: | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2249: | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| 2257: | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 |
| 2265: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2273: | 2 | 0 | 0 | 2 | 4 | 0 | 1 | 1 |
| 2281: | 2 | 1 | 0 | 2 | 1 | 1 | 0 | 1 |
| 2289: | 1 | 1 | 0 | 1 | 0 | 3 | 1 | 0 |
| 2297: | 1 | 2 | 1 | 0 | 1 | 2 | 0 | 0 |
| 2305: | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2313: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2321: | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 2329: | 0 | 0 | 0 | 2 | 2 | 1 | 1 | 2 |
| 2337: | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 2 |
| 2345: | 0 | 2 | 1 | 0 | 1 | 2 | 3 | 0 |
| 2353: | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 1 |
| 2361: | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 2369: | 0 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 2377: | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 1 |
| 2385: | 1 | 2 | 0 | 1 | 0 | 1 | 0 | 2 |
| 2393: | 2 | 0 | 1 | 0 | 0 | 4 | 0 | 0 |
| 2401: | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2409: | 0 | 1 | 1 | 0 | 2 | 1 | 0 | 1 |
| 2417: | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 0 |
| 2425: | 1 | 0 | 0 | 4 | 0 | 0 | 3 | 0 |
| 2433: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2441: | 0 | 0 | 0 | 1 | 0 | 4 | 2 | 2 |
| 2449: | 4 | 3 | 2 | 0 | 0 | 1 | 1 | 1 |
| 2457: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2465: | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 0 |
| 2473: | 1 | 1 | 3 | 1 | 0 | 2 | 0 | 1 |
| 2481: | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 0 |
| 2489: | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 1 |
| 2497: | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 2 |
| 2505: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2513: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 0 |
| 2545: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2553: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2561: | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 0 |
| 2569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2577: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 2 |
| 2585: | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2593: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2601: | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 2609: | 1 | 2 | 3 | 5 | 16 | 21 | 16 | 4 |
| 2617: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2633: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2641: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2657: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 2665: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2673: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 2681: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2689: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2697: | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2705: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2713: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2721: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2729: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2737: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2745: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2761: | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |
| 2769: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2777: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2793: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2801: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2809: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2817: | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2825: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2841: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2849: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2857: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2865: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2873: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2881: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2889: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 2897: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2921: | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2945: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2977: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3009: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3017: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3057: | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3081: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3105: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3113: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3129: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3161: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3169: | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3193: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3233: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3249: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3257: | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3265: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3273: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3337: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3377: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3425: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3561: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3601: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3713: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

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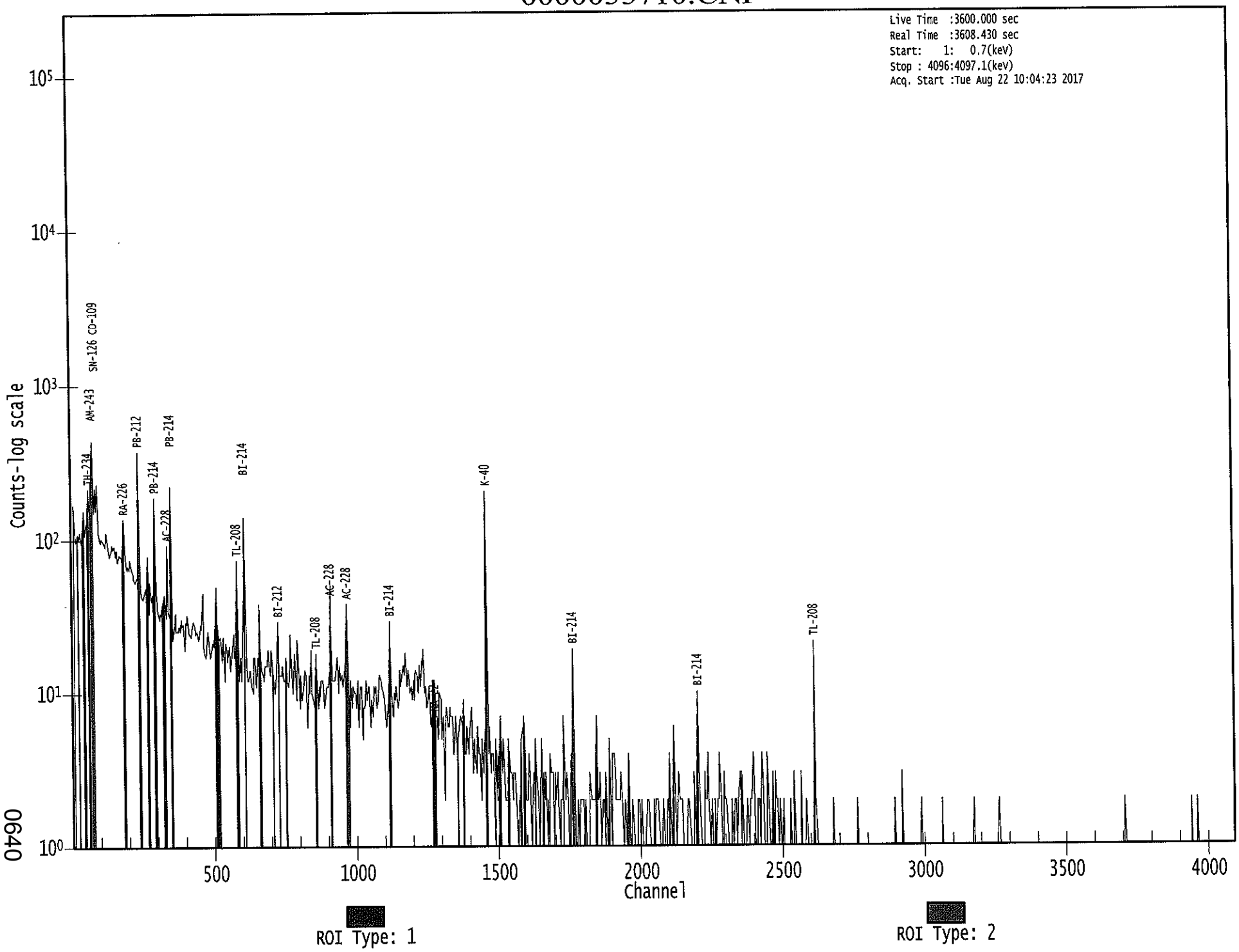
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3897: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3969: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 4017: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 4025: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4041: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 4049: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4057: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# 0000055710.CNF




0640

8/22

Apex-Gamma

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-09 |
| Sample Description | : HTC-A03-S002-3036-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.948E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:43:58AM |
| Acquisition Started | : 8/22/2017 10:21:04AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE4 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.7 seconds |
| Dead Time | : 0.05 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 15 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55711 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG 8/23/17

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 11:21:08AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 46.00 | 45.05 | 0.0000 | 0.00 |
| 2 | 76.53 | 75.58 | 0.0000 | 0.00 |
| 3 | 84.42 | 83.48 | 0.0000 | 0.00 |
| 4 | 86.87 | 85.93 | 0.0000 | 0.00 |
| 5 | 92.72 | 91.78 | 0.0000 | 0.00 |
| 6 | 105.12 | 104.19 | 0.0000 | 0.00 |
| 7 | 185.86 | 184.95 | 0.0000 | 0.00 |
| 8 | 209.26 | 208.36 | 0.0000 | 0.00 |
| 9 | 239.19 | 238.30 | 0.0000 | 0.00 |
| 10 | 278.21 | 277.33 | 0.0000 | 0.00 |
| 11 | 295.71 | 294.84 | 0.0000 | 0.00 |
| 12 | 338.68 | 337.82 | 0.0000 | 0.00 |
| 13 | 352.15 | 351.29 | 0.0000 | 0.00 |
| 14 | 439.65 | 438.83 | 0.0000 | 0.00 |
| 15 | 511.10 | 510.31 | 0.0000 | 0.00 |
| 16 | 566.56 | 565.78 | 0.0000 | 0.00 |
| 17 | 582.94 | 582.17 | 0.0000 | 0.00 |
| 18 | 609.48 | 608.72 | 0.0000 | 0.00 |
| 19 | 662.16 | 661.42 | 0.0000 | 0.00 |
| 20 | 702.33 | 701.61 | 0.0000 | 0.00 |
| 21 | 711.72 | 711.00 | 0.0000 | 0.00 |
| 22 | 911.10 | 910.46 | 0.0000 | 0.00 |
| 23 | 933.34 | 932.71 | 0.0000 | 0.00 |
| 24 | 964.71 | 964.10 | 0.0000 | 0.00 |
| 25 | 968.75 | 968.14 | 0.0000 | 0.00 |
| 26 | 975.41 | 974.80 | 0.0000 | 0.00 |
| 27 | 1120.52 | 1119.98 | 0.0000 | 0.00 |
| 28 | 1182.91 | 1182.40 | 0.0000 | 0.00 |
| 29 | 1237.43 | 1236.94 | 0.0000 | 0.00 |
| 30 | 1242.36 | 1241.87 | 0.0000 | 0.00 |
| 31 | 1247.74 | 1247.25 | 0.0000 | 0.00 |
| 32 | 1351.36 | 1350.93 | 0.0000 | 0.00 |
| 33 | 1460.58 | 1460.21 | 0.0000 | 0.00 |
| 34 | 1507.38 | 1507.03 | 0.0000 | 0.00 |
| 35 | 1590.48 | 1590.17 | 0.0000 | 0.00 |
| 36 | 1629.97 | 1629.69 | 0.0000 | 0.00 |
| 37 | 1667.14 | 1666.88 | 0.0000 | 0.00 |
| 38 | 1728.14 | 1727.90 | 0.0000 | 0.00 |
| 39 | 1763.83 | 1763.62 | 0.0000 | 0.00 |
| 40 | 1847.79 | 1847.63 | 0.0000 | 0.00 |
| 41 | 1885.92 | 1885.78 | 0.0000 | 0.00 |
| 42 | 2102.25 | 2102.23 | 0.0000 | 0.00 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 2613.57 | 2613.89 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 11:21:08AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 46.00 | 41 - | 48 | 45.05 | 1.14E+02 | 78.89 | 9.63E+02 | 3.27 |
| | 2 | 76.53 | 71 - | 81 | 75.58 | 8.84E+02 | 146.91 | 2.37E+03 | 3.79 |
| M | 3 | 84.42 | 82 - | 88 | 83.48 | 5.96E+01 | 36.78 | 3.98E+02 | 1.44 |
| m | 4 | 86.87 | 82 - | 88 | 85.93 | 1.28E+02 | 85.54 | 1.35E+03 | 1.84 |
| | 5 | 92.72 | 89 - | 95 | 91.78 | 2.05E+02 | 92.38 | 1.36E+03 | 2.55 |
| | 6 | 105.12 | 102 - | 107 | 104.19 | 5.56E+01 | 62.52 | 7.41E+02 | 2.84 |
| | 7 | 185.86 | 180 - | 189 | 184.95 | 1.15E+02 | 82.57 | 9.03E+02 | 2.17 |
| | 8 | 209.26 | 204 - | 212 | 208.36 | 8.02E+01 | 76.49 | 8.52E+02 | 2.07 |
| | 9 | 239.19 | 233 - | 244 | 238.30 | 6.75E+02 | 100.18 | 9.15E+02 | 2.43 |
| | 10 | 278.21 | 275 - | 281 | 277.33 | 4.81E+01 | 45.79 | 3.46E+02 | 3.23 |
| | 11 | 295.71 | 290 - | 301 | 294.84 | 1.76E+02 | 73.92 | 5.99E+02 | 2.32 |
| | 12 | 338.68 | 334 - | 342 | 337.82 | 1.05E+02 | 53.00 | 3.64E+02 | 1.96 |
| | 13 | 352.15 | 347 - | 355 | 351.29 | 2.37E+02 | 56.56 | 3.47E+02 | 2.24 |
| | 14 | 439.65 | 435 - | 441 | 438.83 | 2.62E+01 | 33.37 | 1.80E+02 | 1.60 |
| | 15 | 511.10 | 504 - | 516 | 510.31 | 1.34E+02 | 52.29 | 2.54E+02 | 2.35 |
| | 16 | 566.56 | 559 - | 572 | 565.78 | 4.67E+01 | 48.27 | 2.39E+02 | 3.30 |
| | 17 | 582.94 | 576 - | 587 | 582.17 | 1.43E+02 | 49.92 | 2.40E+02 | 2.39 |
| | 18 | 609.48 | 604 - | 612 | 608.72 | 1.91E+02 | 43.61 | 1.75E+02 | 2.32 |
| | 19 | 662.16 | 657 - | 668 | 661.42 | 7.65E+01 | 40.15 | 1.67E+02 | 2.70 |
| | 20 | 702.33 | 700 - | 704 | 701.61 | 1.74E+01 | 17.99 | 5.52E+01 | 1.91 |
| | 21 | 711.72 | 706 - | 714 | 711.00 | 3.01E+01 | 24.82 | 7.58E+01 | 2.68 |
| | 22 | 911.10 | 907 - | 915 | 910.46 | 8.19E+01 | 32.03 | 1.06E+02 | 2.47 |
| | 23 | 933.34 | 929 - | 936 | 932.71 | 2.00E+01 | 19.18 | 4.80E+01 | 1.39 |
| M | 24 | 964.71 | 962 - | 973 | 964.10 | 2.32E+01 | 15.62 | 5.36E+01 | 2.60 |
| m | 25 | 968.75 | 962 - | 973 | 968.14 | 7.24E+01 | 31.46 | 1.03E+02 | 2.97 |
| | 26 | 975.41 | 973 - | 978 | 974.80 | 1.32E+01 | 13.27 | 2.56E+01 | 1.94 |
| | 27 | 1120.52 | 1116 - | 1125 | 1119.98 | 3.88E+01 | 31.95 | 1.20E+02 | 1.83 |
| | 28 | 1182.91 | 1179 - | 1185 | 1182.40 | 1.79E+01 | 20.41 | 6.23E+01 | 3.53 |
| M | 29 | 1237.43 | 1234 - | 1255 | 1236.94 | 1.65E+01 | 19.10 | 6.03E+01 | 2.79 |
| m | 30 | 1242.36 | 1234 - | 1255 | 1241.87 | 2.31E+01 | 23.32 | 6.86E+01 | 2.80 |
| m | 31 | 1247.74 | 1234 - | 1255 | 1247.25 | 1.45E+01 | 21.54 | 5.88E+01 | 2.80 |
| | 32 | 1351.36 | 1340 - | 1361 | 1350.93 | 2.37E+01 | 28.44 | 5.46E+01 | 15.45 |
| | 33 | 1460.58 | 1454 - | 1466 | 1460.21 | 3.75E+02 | 42.18 | 3.33E+01 | 2.55 |
| | 34 | 1507.38 | 1504 - | 1512 | 1507.03 | 1.05E+01 | 12.85 | 2.10E+01 | 4.47 |
| | 35 | 1590.48 | 1583 - | 1597 | 1590.17 | 2.70E+01 | 19.82 | 3.00E+01 | 7.84 |
| | 36 | 1629.97 | 1626 - | 1632 | 1629.69 | 7.00E+00 | 8.03 | 6.00E+00 | 2.87 |
| | 37 | 1667.14 | 1664 - | 1670 | 1666.88 | 8.00E+00 | 5.66 | 0.00E+00 | 3.25 |
| | 38 | 1728.14 | 1723 - | 1734 | 1727.90 | 1.16E+01 | 9.80 | 6.73E+00 | 1.04 |
| | 39 | 1763.83 | 1759 - | 1769 | 1763.62 | 2.37E+01 | 11.59 | 4.54E+00 | 3.69 |
| | 40 | 1847.79 | 1843 - | 1850 | 1847.63 | 8.00E+00 | 5.66 | 0.00E+00 | 3.74 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|
| 41 | 1885.92 | 1880 - | 1889 | 1885.78 | 9.00E+00 | 6.00 | 0.00E+00 | 1.33 |
| 42 | 2102.25 | 2098 - | 2106 | 2102.23 | 1.30E+01 | 7.21 | 0.00E+00 | 3.49 |
| 43 | 2613.57 | 2608 - | 2618 | 2613.89 | 4.75E+01 | 15.17 | 5.06E+00 | 3.44 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 11:21:08AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 46.00 | 41 - | 48 | 1.14E+02 | 78.89 | 9.63E+02 | 6.24E+01 |
| | 2 | 76.53 | 71 - | 81 | 8.84E+02 | 146.91 | 2.37E+03 | 1.10E+02 |
| M | 3 | 84.42 | 82 - | 88 | 5.96E+01 | 36.78 | 3.98E+02 | 3.28E+01 |
| m | 4 | 86.87 | 82 - | 88 | 1.28E+02 | 85.54 | 1.35E+03 | 6.05E+01 |
| | 5 | 92.72 | 89 - | 95 | 2.05E+02 | 92.38 | 1.36E+03 | 7.22E+01 |
| | 6 | 105.12 | 102 - | 107 | 5.56E+01 | 62.52 | 7.41E+02 | 4.99E+01 |
| | 7 | 185.86 | 180 - | 189 | 1.15E+02 | 82.57 | 9.03E+02 | 6.55E+01 |
| | 8 | 209.26 | 204 - | 212 | 8.02E+01 | 76.49 | 8.52E+02 | 6.11E+01 |
| | 9 | 239.19 | 233 - | 244 | 6.75E+02 | 100.18 | 9.15E+02 | 7.04E+01 |
| | 10 | 278.21 | 275 - | 281 | 4.81E+01 | 45.79 | 3.46E+02 | 3.59E+01 |
| | 11 | 295.71 | 290 - | 301 | 1.76E+02 | 73.92 | 5.99E+02 | 5.67E+01 |
| | 12 | 338.68 | 334 - | 342 | 1.05E+02 | 53.00 | 3.64E+02 | 4.02E+01 |
| | 13 | 352.15 | 347 - | 355 | 2.37E+02 | 56.56 | 3.47E+02 | 3.90E+01 |
| | 14 | 439.65 | 435 - | 441 | 2.62E+01 | 33.37 | 1.80E+02 | 2.61E+01 |
| | 15 | 511.10 | 504 - | 516 | 1.34E+02 | 52.29 | 2.54E+02 | 3.85E+01 |
| | 16 | 566.56 | 559 - | 572 | 4.67E+01 | 48.27 | 2.39E+02 | 3.81E+01 |
| | 17 | 582.94 | 576 - | 587 | 1.43E+02 | 49.92 | 2.40E+02 | 3.60E+01 |
| | 18 | 609.48 | 604 - | 612 | 1.91E+02 | 43.61 | 1.75E+02 | 2.77E+01 |
| | 19 | 662.16 | 657 - | 668 | 7.65E+01 | 40.15 | 1.67E+02 | 2.97E+01 |
| | 20 | 702.33 | 700 - | 704 | 1.74E+01 | 17.99 | 5.52E+01 | 1.31E+01 |
| | 21 | 711.72 | 706 - | 714 | 3.01E+01 | 24.82 | 7.58E+01 | 1.83E+01 |
| | 22 | 911.10 | 907 - | 915 | 8.19E+01 | 32.03 | 1.06E+02 | 2.17E+01 |
| | 23 | 933.34 | 929 - | 936 | 2.00E+01 | 19.18 | 4.80E+01 | 1.39E+01 |
| M | 24 | 964.71 | 962 - | 973 | 2.32E+01 | 15.62 | 5.36E+01 | 1.20E+01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| m | 25 | 968.75 | 962 - | 973 | 7.24E+01 | 31.46 | 1.03E+02 | 1.67E+01 |
| | 26 | 975.41 | 973 - | 978 | 1.32E+01 | 13.27 | 2.56E+01 | 9.13E+00 |
| | 27 | 1120.52 | 1116 - | 1125 | 3.88E+01 | 31.95 | 1.20E+02 | 2.42E+01 |
| | 28 | 1182.91 | 1179 - | 1185 | 1.79E+01 | 20.41 | 6.23E+01 | 1.53E+01 |
| M | 29 | 1237.43 | 1234 - | 1255 | 1.65E+01 | 19.10 | 6.03E+01 | 1.28E+01 |
| m | 30 | 1242.36 | 1234 - | 1255 | 2.31E+01 | 23.32 | 6.86E+01 | 1.36E+01 |
| m | 31 | 1247.74 | 1234 - | 1255 | 1.45E+01 | 21.54 | 5.88E+01 | 1.26E+01 |
| | 32 | 1351.36 | 1340 - | 1361 | 2.37E+01 | 28.44 | 5.46E+01 | 2.20E+01 |
| | 33 | 1460.58 | 1454 - | 1466 | 3.75E+02 | 42.18 | 3.33E+01 | 1.37E+01 |
| | 34 | 1507.38 | 1504 - | 1512 | 1.05E+01 | 12.85 | 2.10E+01 | 9.11E+00 |
| | 35 | 1590.48 | 1583 - | 1597 | 2.70E+01 | 19.82 | 3.00E+01 | 1.39E+01 |
| | 36 | 1629.97 | 1626 - | 1632 | 7.00E+00 | 8.03 | 6.00E+00 | 4.97E+00 |
| | 37 | 1667.14 | 1664 - | 1670 | 8.00E+00 | 5.66 | 0.00E+00 | 0.00E+00 |
| | 38 | 1728.14 | 1723 - | 1734 | 1.16E+01 | 9.80 | 6.73E+00 | 5.78E+00 |
| | 39 | 1763.83 | 1759 - | 1769 | 2.37E+01 | 11.59 | 4.54E+00 | 5.15E+00 |
| | 40 | 1847.79 | 1843 - | 1850 | 8.00E+00 | 5.66 | 0.00E+00 | 0.00E+00 |
| | 41 | 1885.92 | 1880 - | 1889 | 9.00E+00 | 6.00 | 0.00E+00 | 0.00E+00 |
| | 42 | 2102.25 | 2098 - | 2106 | 1.30E+01 | 7.21 | 0.00E+00 | 0.00E+00 |
| | 43 | 2613.57 | 2608 - | 2618 | 4.75E+01 | 15.17 | 5.06E+00 | 5.22E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 11:21:08AM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 46.00 | 41 - | 48 | 45.05 | 1.14E+02 | 78.89 | 9.63E+02 | PB-210 |
| | 2 | 76.53 | 71 - | 81 | 75.58 | 8.84E+02 | 146.91 | 2.37E+03 | ..... |
| M | 3 | 84.42 | 82 - | 88 | 83.48 | 5.96E+01 | 36.78 | 3.98E+02 | TH-231 |
| m | 4 | 86.87 | 82 - | 88 | 85.93 | 1.28E+02 | 85.54 | 1.35E+03 | NP-237 |
| | | | | | | | | | EU-155 |
| | | | | | | | | | SN-126 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 5 | 92.72 | 89 - | 95 | 91.78 | 2.05E+02 | 92.38 | 1.36E+03 | GA-67 |
| | 6 | 105.12 | 102 - | 107 | 104.19 | 5.56E+01 | 62.52 | 7.41E+02 | EU-155 |
| | | | | | | | | | NP-239 |
| | 7 | 185.86 | 180 - | 189 | 184.95 | 1.15E+02 | 82.57 | 9.03E+02 | RA-226 |
| | 8 | 209.26 | 204 - | 212 | 208.36 | 8.02E+01 | 76.49 | 8.52E+02 | GA-67 |
| | | | | | | | | | CM-243 |
| | 9 | 239.19 | 233 - | 244 | 238.30 | 6.75E+02 | 100.18 | 9.15E+02 | PB-212 |
| | 10 | 278.21 | 275 - | 281 | 277.33 | 4.81E+01 | 45.79 | 3.46E+02 | CM-243 |
| | | | | | | | | | NP-239 |
| | | | | | | | | | HG-203 |
| | 11 | 295.71 | 290 - | 301 | 294.84 | 1.76E+02 | 73.92 | 5.99E+02 | PB-214 |
| | 12 | 338.68 | 334 - | 342 | 337.82 | 1.05E+02 | 53.00 | 3.64E+02 | AC-228 |
| | 13 | 352.15 | 347 - | 355 | 351.29 | 2.37E+02 | 56.56 | 3.47E+02 | PB-214 |
| | 14 | 439.65 | 435 - | 441 | 438.83 | 2.62E+01 | 33.37 | 1.80E+02 | ..... |
| | 15 | 511.10 | 504 - | 516 | 510.31 | 1.34E+02 | 52.29 | 2.54E+02 | ..... |
| | 16 | 566.56 | 559 - | 572 | 565.78 | 4.67E+01 | 48.27 | 2.39E+02 | ..... |
| | 17 | 582.94 | 576 - | 587 | 582.17 | 1.43E+02 | 49.92 | 2.40E+02 | TL-208 |
| | 18 | 609.48 | 604 - | 612 | 608.72 | 1.91E+02 | 43.61 | 1.75E+02 | BI-214 |
| | 19 | 662.16 | 657 - | 668 | 661.42 | 7.65E+01 | 40.15 | 1.67E+02 | CS-137 |
| | 20 | 702.33 | 700 - | 704 | 701.61 | 1.74E+01 | 17.99 | 5.52E+01 | NB-94 |
| | 21 | 711.72 | 706 - | 714 | 711.00 | 3.01E+01 | 24.82 | 7.58E+01 | HO-166M |
| | 22 | 911.10 | 907 - | 915 | 910.46 | 8.19E+01 | 32.03 | 1.06E+02 | AC-228 |
| | | | | | | | | | TL-204 |
| | 23 | 933.34 | 929 - | 936 | 932.71 | 2.00E+01 | 19.18 | 4.80E+01 | ..... |
| M | 24 | 964.71 | 962 - | 973 | 964.10 | 2.32E+01 | 15.62 | 5.36E+01 | EU-152 |
| m | 25 | 968.75 | 962 - | 973 | 968.14 | 7.24E+01 | 31.46 | 1.03E+02 | AC-228 |
| | 26 | 975.41 | 973 - | 978 | 974.80 | 1.32E+01 | 13.27 | 2.56E+01 | ..... |
| | 27 | 1120.52 | 1116 - | 1125 | 1119.98 | 3.88E+01 | 31.95 | 1.20E+02 | SC-46 |
| | | | | | | | | | BI-214 |
| | | | | | | | | | TA-182 |
| | 28 | 1182.91 | 1179 - | 1185 | 1182.40 | 1.79E+01 | 20.41 | 6.23E+01 | ..... |
| M | 29 | 1237.43 | 1234 - | 1255 | 1236.94 | 1.65E+01 | 19.10 | 6.03E+01 | CO-56 |
| m | 30 | 1242.36 | 1234 - | 1255 | 1241.87 | 2.31E+01 | 23.32 | 6.86E+01 | ..... |
| m | 31 | 1247.74 | 1234 - | 1255 | 1247.25 | 1.45E+01 | 21.54 | 5.88E+01 | ..... |
| | 32 | 1351.36 | 1340 - | 1361 | 1350.93 | 2.37E+01 | 28.44 | 5.46E+01 | ..... |
| | 33 | 1460.58 | 1454 - | 1466 | 1460.21 | 3.75E+02 | 42.18 | 3.33E+01 | K-40 |
| | 34 | 1507.38 | 1504 - | 1512 | 1507.03 | 1.05E+01 | 12.85 | 2.10E+01 | ..... |
| | 35 | 1590.48 | 1583 - | 1597 | 1590.17 | 2.70E+01 | 19.82 | 3.00E+01 | ..... |
| | 36 | 1629.97 | 1626 - | 1632 | 1629.69 | 7.00E+00 | 8.03 | 6.00E+00 | ..... |
| | 37 | 1667.14 | 1664 - | 1670 | 1666.88 | 8.00E+00 | 5.66 | 0.00E+00 | ..... |
| | 38 | 1728.14 | 1723 - | 1734 | 1727.90 | 1.16E+01 | 9.80 | 6.73E+00 | ..... |
| | 39 | 1763.83 | 1759 - | 1769 | 1763.62 | 2.37E+01 | 11.59 | 4.54E+00 | BI-214 |
| | 40 | 1847.79 | 1843 - | 1850 | 1847.63 | 8.00E+00 | 5.66 | 0.00E+00 | ..... |
| | 41 | 1885.92 | 1880 - | 1889 | 1885.78 | 9.00E+00 | 6.00 | 0.00E+00 | ..... |
| | 42 | 2102.25 | 2098 - | 2106 | 2102.23 | 1.30E+01 | 7.21 | 0.00E+00 | ..... |
| | 43 | 2613.57 | 2608 - | 2618 | 2613.89 | 4.75E+01 | 15.17 | 5.06E+00 | ..... |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 11:21:08AM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 46.00 | 1.14E+02 | 78.89 | 1.62E-02 | 1.56E-03 |
| | 2 | 76.53 | 8.84E+02 | 146.91 | 2.33E-02 | 1.92E-03 |
| M | 3 | 84.42 | 5.96E+01 | 36.78 | 2.36E-02 | 2.09E-03 |
| m | 4 | 86.87 | 1.28E+02 | 85.54 | 2.37E-02 | 2.14E-03 |
| | 5 | 92.72 | 2.05E+02 | 92.38 | 2.37E-02 | 2.10E-03 |
| | 6 | 105.12 | 5.56E+01 | 62.52 | 2.32E-02 | 1.91E-03 |
| | 7 | 185.86 | 1.15E+02 | 82.57 | 1.69E-02 | 1.40E-03 |
| | 8 | 209.26 | 8.02E+01 | 76.49 | 1.53E-02 | 1.28E-03 |
| | 9 | 239.19 | 6.75E+02 | 100.18 | 1.36E-02 | 1.14E-03 |
| | 10 | 278.21 | 4.81E+01 | 45.79 | 1.17E-02 | 9.52E-04 |
| | 11 | 295.71 | 1.76E+02 | 73.92 | 1.10E-02 | 9.12E-04 |
| | 12 | 338.68 | 1.05E+02 | 53.00 | 9.59E-03 | 8.22E-04 |
| | 13 | 352.15 | 2.37E+02 | 56.56 | 9.21E-03 | 7.94E-04 |
| | 14 | 439.65 | 2.62E+01 | 33.37 | 7.32E-03 | 6.91E-04 |
| | 15 | 511.10 | 1.34E+02 | 52.29 | 6.28E-03 | 6.61E-04 |
| | 16 | 566.56 | 4.67E+01 | 48.27 | 5.66E-03 | 6.38E-04 |
| | 17 | 582.94 | 1.43E+02 | 49.92 | 5.51E-03 | 6.31E-04 |
| | 18 | 609.48 | 1.91E+02 | 43.61 | 5.27E-03 | 6.20E-04 |
| | 19 | 662.16 | 7.65E+01 | 40.15 | 4.86E-03 | 5.98E-04 |
| | 20 | 702.33 | 1.74E+01 | 17.99 | 4.60E-03 | 5.48E-04 |
| | 21 | 711.72 | 3.01E+01 | 24.82 | 4.54E-03 | 5.36E-04 |
| | 22 | 911.10 | 8.19E+01 | 32.03 | 3.62E-03 | 2.99E-04 |
| | 23 | 933.34 | 2.00E+01 | 19.18 | 3.54E-03 | 2.94E-04 |
| M | 24 | 964.71 | 2.32E+01 | 15.62 | 3.44E-03 | 2.86E-04 |
| m | 25 | 968.75 | 7.24E+01 | 31.46 | 3.43E-03 | 2.85E-04 |
| | 26 | 975.41 | 1.32E+01 | 13.27 | 3.41E-03 | 2.84E-04 |
| | 27 | 1120.52 | 3.88E+01 | 31.95 | 3.01E-03 | 2.50E-04 |
| | 28 | 1182.91 | 1.79E+01 | 20.41 | 2.87E-03 | 2.37E-04 |
| M | 29 | 1237.43 | 1.65E+01 | 19.10 | 2.76E-03 | 2.33E-04 |
| m | 30 | 1242.36 | 2.31E+01 | 23.32 | 2.75E-03 | 2.33E-04 |
| m | 31 | 1247.74 | 1.45E+01 | 21.54 | 2.74E-03 | 2.33E-04 |
| | 32 | 1351.36 | 2.37E+01 | 28.44 | 2.56E-03 | 2.24E-04 |
| | 33 | 1460.58 | 3.75E+02 | 42.18 | 2.39E-03 | 2.08E-04 |
| | 34 | 1507.38 | 1.05E+01 | 12.85 | 2.32E-03 | 2.01E-04 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 35 | 1590.48 | 2.70E+01 | 19.82 | 2.21E-03 | 1.88E-04 |
| 36 | 1629.97 | 7.00E+00 | 8.03 | 2.16E-03 | 1.82E-04 |
| 37 | 1667.14 | 8.00E+00 | 5.66 | 2.11E-03 | 1.77E-04 |
| 38 | 1728.14 | 1.16E+01 | 9.80 | 2.04E-03 | 1.67E-04 |
| 39 | 1763.83 | 2.37E+01 | 11.59 | 2.00E-03 | 1.62E-04 |
| 40 | 1847.79 | 8.00E+00 | 5.66 | 1.91E-03 | 1.51E-04 |
| 41 | 1885.92 | 9.00E+00 | 6.00 | 1.87E-03 | 1.51E-04 |
| 42 | 2102.25 | 1.30E+01 | 7.21 | 1.67E-03 | 1.51E-04 |
| 43 | 2613.57 | 4.75E+01 | 15.17 | 1.28E-03 | 1.51E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 11:21:08AM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 46.00 | 1.14E+02 | 78.89 | 2.81E+01 | 8.29E+00 | 8.62E+01 | 7.93E+01 |
| | 2 | 76.53 | 8.84E+02 | 146.91 | | | 8.84E+02 | 1.47E+02 |
| M | 3 | 84.42 | 5.96E+01 | 36.78 | | | 5.96E+01 | 3.68E+01 |
| m | 4 | 86.87 | 1.28E+02 | 85.54 | | | 1.28E+02 | 8.55E+01 |
| | 5 | 92.72 | 2.05E+02 | 92.38 | 5.99E+01 | 8.61E+00 | 1.45E+02 | 9.28E+01 |
| | 6 | 105.12 | 5.56E+01 | 62.52 | | | 5.56E+01 | 6.25E+01 |
| | 7 | 185.86 | 1.15E+02 | 82.57 | 2.43E+01 | 7.50E+00 | 9.10E+01 | 8.29E+01 |
| | 8 | 209.26 | 8.02E+01 | 76.49 | | | 8.02E+01 | 7.65E+01 |
| | 9 | 239.19 | 6.75E+02 | 100.18 | 1.06E+01 | 6.01E+00 | 6.64E+02 | 1.00E+02 |
| | 10 | 278.21 | 4.81E+01 | 45.79 | | | 4.81E+01 | 4.58E+01 |
| | 11 | 295.71 | 1.76E+02 | 73.92 | | | 1.76E+02 | 7.39E+01 |
| | 12 | 338.68 | 1.05E+02 | 53.00 | | | 1.05E+02 | 5.30E+01 |
| | 13 | 352.15 | 2.37E+02 | 56.56 | | | 2.37E+02 | 5.66E+01 |
| | 14 | 439.65 | 2.62E+01 | 33.37 | | | 2.62E+01 | 3.34E+01 |
| | 15 | 511.10 | 1.34E+02 | 52.29 | 4.55E+01 | 4.99E+00 | 8.86E+01 | 5.25E+01 |
| | 16 | 566.56 | 4.67E+01 | 48.27 | | | 4.67E+01 | 4.83E+01 |
| | 17 | 582.94 | 1.43E+02 | 49.92 | | | 1.43E+02 | 4.99E+01 |
| | 18 | 609.48 | 1.91E+02 | 43.61 | | | 1.91E+02 | 4.36E+01 |
| | 19 | 662.16 | 7.65E+01 | 40.15 | | | 7.65E+01 | 4.01E+01 |
| | 20 | 702.33 | 1.74E+01 | 17.99 | | | 1.74E+01 | 1.80E+01 |
| | 21 | 711.72 | 3.01E+01 | 24.82 | | | 3.01E+01 | 2.48E+01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 22 | 911.10 | 8.19E+01 | 32.03 | | | 8.19E+01 | 3.20E+01 |
| | 23 | 933.34 | 2.00E+01 | 19.18 | | | 2.00E+01 | 1.92E+01 |
| M | 24 | 964.71 | 2.32E+01 | 15.62 | | | 2.32E+01 | 1.56E+01 |
| m | 25 | 968.75 | 7.24E+01 | 31.46 | | | 7.24E+01 | 3.15E+01 |
| | 26 | 975.41 | 1.32E+01 | 13.27 | | | 1.32E+01 | 1.33E+01 |
| | 27 | 1120.52 | 3.88E+01 | 31.95 | | | 3.88E+01 | 3.20E+01 |
| | 28 | 1182.91 | 1.79E+01 | 20.41 | | | 1.79E+01 | 2.04E+01 |
| M | 29 | 1237.43 | 1.65E+01 | 19.10 | | | 1.65E+01 | 1.91E+01 |
| m | 30 | 1242.36 | 2.31E+01 | 23.32 | | | 2.31E+01 | 2.33E+01 |
| m | 31 | 1247.74 | 1.45E+01 | 21.54 | | | 1.45E+01 | 2.15E+01 |
| | 32 | 1351.36 | 2.37E+01 | 28.44 | | | 2.37E+01 | 2.84E+01 |
| | 33 | 1460.58 | 3.75E+02 | 42.18 | | | 3.75E+02 | 4.22E+01 |
| | 34 | 1507.38 | 1.05E+01 | 12.85 | | | 1.05E+01 | 1.28E+01 |
| | 35 | 1590.48 | 2.70E+01 | 19.82 | | | 2.70E+01 | 1.98E+01 |
| | 36 | 1629.97 | 7.00E+00 | 8.03 | | | 7.00E+00 | 8.03E+00 |
| | 37 | 1667.14 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 38 | 1728.14 | 1.16E+01 | 9.80 | | | 1.16E+01 | 9.80E+00 |
| | 39 | 1763.83 | 2.37E+01 | 11.59 | | | 2.37E+01 | 1.16E+01 |
| | 40 | 1847.79 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 41 | 1885.92 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| | 42 | 2102.25 | 1.30E+01 | 7.21 | | | 1.30E+01 | 7.21E+00 |
| | 43 | 2613.57 | 4.75E+01 | 15.17 | | | 4.75E+01 | 1.52E+01 |

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 11:21:08AM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 46.00 | 1.14E+02 | 78.89 | 2.81E+01 | 8.29E+00 | 8.62E+01 | 7.93E+01 |
| | 2 | 76.53 | 8.84E+02 | 146.91 | | | 8.84E+02 | 1.47E+02 |
| M | 3 | 84.42 | 5.96E+01 | 36.78 | | | 5.96E+01 | 3.68E+01 |
| m | 4 | 86.87 | 1.28E+02 | 85.54 | | | 1.28E+02 | 8.55E+01 |
| | 5 | 92.72 | 2.05E+02 | 92.38 | 5.99E+01 | 8.61E+00 | 1.45E+02 | 9.28E+01 |
| | 6 | 105.12 | 5.56E+01 | 62.52 | | | 5.56E+01 | 6.25E+01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 7 | 185.86 | 1.15E+02 | 82.57 | 2.43E+01 | 7.50E+00 | 9.10E+01 | 8.29E+01 |
| | 8 | 209.26 | 8.02E+01 | 76.49 | | | 8.02E+01 | 7.65E+01 |
| | 9 | 239.19 | 6.75E+02 | 100.18 | 1.06E+01 | 6.01E+00 | 6.64E+02 | 1.00E+02 |
| | 10 | 278.21 | 4.81E+01 | 45.79 | | | 4.81E+01 | 4.58E+01 |
| | 11 | 295.71 | 1.76E+02 | 73.92 | | | 1.76E+02 | 7.39E+01 |
| | 12 | 338.68 | 1.05E+02 | 53.00 | | | 1.05E+02 | 5.30E+01 |
| | 13 | 352.15 | 2.37E+02 | 56.56 | | | 2.37E+02 | 5.66E+01 |
| | 14 | 439.65 | 2.62E+01 | 33.37 | | | 2.62E+01 | 3.34E+01 |
| | 15 | 511.10 | 1.34E+02 | 52.29 | 4.55E+01 | 4.99E+00 | 8.86E+01 | 5.25E+01 |
| | 16 | 566.56 | 4.67E+01 | 48.27 | | | 4.67E+01 | 4.83E+01 |
| | 17 | 582.94 | 1.43E+02 | 49.92 | | | 1.43E+02 | 4.99E+01 |
| | 18 | 609.48 | 1.91E+02 | 43.61 | | | 1.91E+02 | 4.36E+01 |
| | 19 | 662.16 | 7.65E+01 | 40.15 | | | 7.65E+01 | 4.01E+01 |
| | 20 | 702.33 | 1.74E+01 | 17.99 | | | 1.74E+01 | 1.80E+01 |
| | 21 | 711.72 | 3.01E+01 | 24.82 | | | 3.01E+01 | 2.48E+01 |
| | 22 | 911.10 | 8.19E+01 | 32.03 | | | 8.19E+01 | 3.20E+01 |
| | 23 | 933.34 | 2.00E+01 | 19.18 | | | 2.00E+01 | 1.92E+01 |
| M | 24 | 964.71 | 2.32E+01 | 15.62 | | | 2.32E+01 | 1.56E+01 |
| m | 25 | 968.75 | 7.24E+01 | 31.46 | | | 7.24E+01 | 3.15E+01 |
| | 26 | 975.41 | 1.32E+01 | 13.27 | | | 1.32E+01 | 1.33E+01 |
| | 27 | 1120.52 | 3.88E+01 | 31.95 | | | 3.88E+01 | 3.20E+01 |
| | 28 | 1182.91 | 1.79E+01 | 20.41 | | | 1.79E+01 | 2.04E+01 |
| M | 29 | 1237.43 | 1.65E+01 | 19.10 | | | 1.65E+01 | 1.91E+01 |
| m | 30 | 1242.36 | 2.31E+01 | 23.32 | | | 2.31E+01 | 2.33E+01 |
| m | 31 | 1247.74 | 1.45E+01 | 21.54 | | | 1.45E+01 | 2.15E+01 |
| | 32 | 1351.36 | 2.37E+01 | 28.44 | | | 2.37E+01 | 2.84E+01 |
| | 33 | 1460.58 | 3.75E+02 | 42.18 | | | 3.75E+02 | 4.22E+01 |
| | 34 | 1507.38 | 1.05E+01 | 12.85 | | | 1.05E+01 | 1.28E+01 |
| | 35 | 1590.48 | 2.70E+01 | 19.82 | | | 2.70E+01 | 1.98E+01 |
| | 36 | 1629.97 | 7.00E+00 | 8.03 | | | 7.00E+00 | 8.03E+00 |
| | 37 | 1667.14 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 38 | 1728.14 | 1.16E+01 | 9.80 | | | 1.16E+01 | 9.80E+00 |
| | 39 | 1763.83 | 2.37E+01 | 11.59 | | | 2.37E+01 | 1.16E+01 |
| | 40 | 1847.79 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| | 41 | 1885.92 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| | 42 | 2102.25 | 1.30E+01 | 7.21 | | | 1.30E+01 | 7.21E+00 |
| | 43 | 2613.57 | 4.75E+01 | 15.17 | | | 4.75E+01 | 1.52E+01 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.992 | 1460.81 | * | 10.67 | 1.59E+01 | 2.29E+00 |
| CS-137 | 0.959 | 661.65 | * | 85.12 | 2.01E-01 | 1.08E-01 |
| EU-155 | 0.985 | 86.50 | * | 30.90 | 1.96E-01 | 1.32E-01 |
| | | 105.30 | * | 20.70 | 1.30E-01 | 1.46E-01 |
| TL-208 | 0.341 | 583.14 | * | 30.22 | 9.28E-01 | 3.41E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | | 35.85 | | |
| PB-210 | 0.961 | 46.50 | * | 4.25 | 1.36E+00 | 1.26E+00 |
| PB-212 | 0.852 | 238.63 | * | 44.60 | 1.19E+00 | 2.05E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.920 | 609.31 | * | 46.30 | 8.44E-01 | 2.17E-01 |
| | | 1120.29 | * | 15.10 | 9.22E-01 | 7.63E-01 |
| | | 1764.49 | * | 15.80 | 8.12E-01 | 4.02E-01 |
| | | 2204.22 | | 4.98 | | |
| PB-214 | 0.981 | 295.21 | * | 19.19 | 8.98E-01 | 3.85E-01 |
| | | 351.92 | * | 37.19 | 7.46E-01 | 1.90E-01 |
| RA-226 | 0.981 | 186.21 | * | 3.28 | 1.77E+00 | 3.62E+00 |
| AC-228 | 0.990 | 338.32 | * | 11.40 | 1.04E+00 | 5.31E-01 |
| | | 911.07 | * | 27.70 | 8.83E-01 | 3.53E-01 |
| | | 969.11 | * | 16.60 | 1.38E+00 | 6.09E-01 |
| CM-243 | 0.333 | 209.75 | * | 3.29 | 1.73E+00 | 1.66E+00 |
| | | 228.14 | | 10.60 | | |
| | | 277.60 | * | 14.00 | 3.19E-01 | 3.05E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 11:21:08AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 2 | 76.53 | 2.45641E-01 | 8.31 | | |
| M | 3 | 84.42 | 1.65538E-02 | 30.86 | Tol. | TH-231 |
| | 5 | 92.72 | 4.02246E-02 | 32.04 | Sum | |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 14 | 439.65 | 7.26772E-03 | 63.76 | Sum | |
| | 15 | 511.10 | 2.46238E-02 | 29.63 | | |
| | 16 | 566.56 | 1.29602E-02 | 51.73 | | |
| | 20 | 702.33 | 4.83333E-03 | 51.70 | | |
| | 21 | 711.72 | 8.35580E-03 | 41.26 | Tol. | HO-166M |
| | 23 | 933.34 | 5.55556E-03 | 47.96 | | |
| M | 24 | 964.71 | 6.43920E-03 | 33.69 | Tol. | EU-152 |
| | 26 | 975.41 | 3.66453E-03 | 50.28 | | |
| | 28 | 1182.91 | 4.96032E-03 | 57.14 | | |
| M | 29 | 1237.43 | 4.58124E-03 | 57.92 | | |
| m | 30 | 1242.36 | 6.41137E-03 | 50.53 | | |
| m | 31 | 1247.74 | 4.02135E-03 | 74.40 | Sum | |
| | 32 | 1351.36 | 6.58497E-03 | 59.99 | | |
| | 34 | 1507.38 | 2.92328E-03 | 61.03 | Sum | |
| | 35 | 1590.48 | 7.50000E-03 | 36.71 | | |
| | 36 | 1629.97 | 1.94444E-03 | 57.37 | Sum | |
| | 37 | 1667.14 | 2.22222E-03 | 35.36 | | |
| | 38 | 1728.14 | 3.23148E-03 | 42.11 | | |
| | 40 | 1847.79 | 2.22222E-03 | 35.36 | | |
| | 41 | 1885.92 | 2.50000E-03 | 33.33 | | |
| | 42 | 2102.25 | 3.61111E-03 | 27.74 | Sum | |
| | 43 | 2613.57 | 1.31861E-02 | 15.98 | | |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.99 | 1460.81 | * | 10.67 | 1.59E+01 | 2.29E+00 |
| CS-137 | 0.95 | 661.65 | * | 85.12 | 2.01E-01 | 1.08E-01 |
| EU-155 | 0.98 | 86.50 | * | 30.90 | 1.96E-01 | 1.32E-01 |
| | | 105.30 | * | 20.70 | 1.30E-01 | 1.46E-01 |
| TL-208 | 0.34 | 583.14 | * | 30.22 | 9.28E-01 | 3.41E-01 |
| | | 860.37 | | 4.48 | | |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| TL-208 | 0.34 | 2614.66 | | 35.85 | | |
| PB-210 | 0.96 | 46.50 | * | 4.25 | 1.36E+00 | 1.26E+00 |
| PB-212 | 0.85 | 238.63 | * | 44.60 | 1.19E+00 | 2.05E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.92 | 609.31 | * | 46.30 | 8.44E-01 | 2.17E-01 |
| | | 1120.29 | * | 15.10 | 9.22E-01 | 7.63E-01 |
| | | 1764.49 | * | 15.80 | 8.12E-01 | 4.02E-01 |
| | | 2204.22 | | 4.98 | | |
| PB-214 | 0.98 | 295.21 | * | 19.19 | 8.98E-01 | 3.85E-01 |
| | | 351.92 | * | 37.19 | 7.46E-01 | 1.90E-01 |
| RA-226 | 0.98 | 186.21 | * | 3.28 | 1.77E+00 | 3.62E+00 |
| AC-228 | 0.99 | 338.32 | * | 11.40 | 1.04E+00 | 5.31E-01 |
| | | 911.07 | * | 27.70 | 8.83E-01 | 3.53E-01 |
| | | 969.11 | * | 16.60 | 1.38E+00 | 6.09E-01 |
| CM-243 | 0.33 | 209.75 | * | 3.29 | 1.73E+00 | 1.66E+00 |
| | | 228.14 | | 10.60 | | |
| | | 277.60 | * | 14.00 | 3.19E-01 | 3.05E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.992 | 1.59E+01 | 2.29E+00 | |
| X | SN-126 | 0.924 | | | |
| | CS-137 | 0.959 | 2.01E-01 | 1.08E-01 | |
| | EU-155 | 0.985 | 1.66E-01 | 9.82E-02 | |
| X | HG-203 | 0.837 | | | |
| | TL-208 | 0.341 | 9.28E-01 | 3.41E-01 | |
| | PB-210 | 0.961 | 1.36E+00 | 1.26E+00 | |
| | PB-212 | 0.852 | 1.19E+00 | 2.05E-01 | |
| | BI-214 | 0.920 | 8.42E-01 | 1.85E-01 | |
| | PB-214 | 0.981 | 7.76E-01 | 1.70E-01 | |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | RA-226 | 0.981 | 1.77E+00 | 3.62E+00 | |
| | AC-228 | 0.990 | 1.01E+00 | 2.65E-01 | |
| X | NP-237 | 0.979 | | | |
| | CM-243 | 0.333 | 3.65E-01 | 3.00E-01 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 11:21:08AM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 2 | 76.53 | 2.45641E-01 | 8.31 | | |
| M | 3 | 84.42 | 1.65538E-02 | 30.86 | Tol. | TH-231 |
| | 5 | 92.72 | 4.02246E-02 | 32.04 | Sum | |
| | 14 | 439.65 | 7.26772E-03 | 63.76 | Sum | |
| | 15 | 511.10 | 2.46238E-02 | 29.63 | | |
| | 16 | 566.56 | 1.29602E-02 | 51.73 | | |
| | 20 | 702.33 | 4.83333E-03 | 51.70 | | |
| | 21 | 711.72 | 8.35580E-03 | 41.26 | Tol. | HO-166M |
| | 23 | 933.34 | 5.55556E-03 | 47.96 | | |
| M | 24 | 964.71 | 6.43920E-03 | 33.69 | Tol. | EU-152 |
| | 26 | 975.41 | 3.66453E-03 | 50.28 | | |
| | 28 | 1182.91 | 4.96032E-03 | 57.14 | | |
| M | 29 | 1237.43 | 4.58124E-03 | 57.92 | | |
| m | 30 | 1242.36 | 6.41137E-03 | 50.53 | | |
| m | 31 | 1247.74 | 4.02135E-03 | 74.40 | Sum | |
| | 32 | 1351.36 | 6.58497E-03 | 59.99 | | |
| | 34 | 1507.38 | 2.92328E-03 | 61.03 | Sum | |
| | 35 | 1590.48 | 7.50000E-03 | 36.71 | | |
| | 36 | 1629.97 | 1.94444E-03 | 57.37 | Sum | |
| | 37 | 1667.14 | 2.22222E-03 | 35.36 | | |
| | 38 | 1728.14 | 3.23148E-03 | 42.11 | | |
| | 40 | 1847.79 | 2.22222E-03 | 35.36 | | |
| | 41 | 1885.92 | 2.50000E-03 | 33.33 | | |
| | 42 | 2102.25 | 3.61111E-03 | 27.74 | Sum | |
| | 43 | 2613.57 | 1.31861E-02 | 15.98 | | |

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

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | -9.97E-01 | 2.66E+00 | 2.66E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | 2.71E-02 | 1.62E-01 | 1.62E-01 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | 2.41E-02 | 8.81E-02 | 8.81E-02 |
| + | | K-40 | 1460.81 | * | 10.67 | 1.59E+01 | 1.28E+00 | 1.28E+00 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | -4.10E-02 | 7.14E-02 | 7.14E-02 |
| | | | 78.34 | | 96.00 | 3.26E-01 | | 8.88E-02 |
| + | | SC-46 | 889.25 | | 99.98 | 2.96E-02 | 2.53E-01 | 2.53E-01 |
| | | | 1120.51 | | 99.99 | 3.83E-01 | | 3.95E-01 |
| + | | V-48 | 983.52 | | 99.98 | 7.30E+00 | 9.19E+00 | 9.19E+00 |
| | | | 1312.10 | | 97.50 | -2.50E+00 | | 9.95E+00 |
| + | | CR-51 | 320.08 | | 9.83 | -3.19E+00 | 7.68E+00 | 7.68E+00 |
| + | | MN-54 | 834.83 | | 99.97 | 4.77E-02 | 1.46E-01 | 1.46E-01 |
| + | | CO-56 | 846.75 | | 99.96 | 1.56E-02 | 2.53E-01 | 2.53E-01 |
| | | | 1037.75 | | 14.03 | 8.01E-01 | | 2.04E+00 |
| | | | 1238.25 | | 67.00 | 1.66E-01 | | 6.27E-01 |
| | | | 1771.40 | | 15.51 | -8.38E-02 | | 1.10E+00 |
| | | | 2598.48 | | 16.90 | 5.93E-02 | | 1.10E+00 |
| + | | CO-57 | 122.06 | | 85.51 | -1.73E-02 | 7.73E-02 | 7.73E-02 |
| | | | 136.48 | | 10.60 | -7.35E-02 | | 6.30E-01 |
| + | | CO-58 | 810.76 | | 99.40 | 2.56E-03 | 2.91E-01 | 2.91E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | -1.39E-01 | 9.88E-01 | 9.88E-01 |
| | | | 1291.56 | | 43.20 | -3.64E-01 | | 1.26E+00 |
| + | | CO-60 | 1173.22 | | 100.00 | 4.59E-02 | 1.02E-01 | 1.51E-01 |
| | | | 1332.49 | | 100.00 | -4.35E-02 | | 1.02E-01 |
| + | | ZN-65 | 1115.52 | | 50.75 | 4.90E-03 | 3.93E-01 | 3.93E-01 |
| + | | GA-67 | 93.31 | | 35.70 | 2.89E+08 | 2.60E+08 | 2.60E+08 |
| | | | 208.95 | | 2.24 | 3.65E+09 | | 4.40E+09 |
| | | | 300.22 | | 16.00 | -8.47E+08 | | 6.39E+08 |
| + | | SE-75 | 121.11 | | 16.70 | 8.78E-02 | 1.55E-01 | 5.49E-01 |
| | | | 136.00 | | 59.20 | -7.05E-02 | | 1.55E-01 |
| | | | 264.65 | | 59.80 | -1.27E-01 | | 1.72E-01 |
| | | | 279.53 | | 25.20 | 3.74E-01 | | 4.79E-01 |
| | | | 400.65 | | 11.40 | 3.55E-01 | | 1.16E+00 |
| + | | RB-82 | 776.52 | | 13.00 | -3.09E+00 | 1.18E+01 | 1.18E+01 |
| + | | RB-83 | 520.41 | | 46.00 | -1.36E-01 | 3.38E-01 | 3.38E-01 |
| | | | 529.64 | | 30.30 | -1.28E-01 | | 5.37E-01 |
| | | | 552.65 | | 16.40 | 5.87E-01 | | 1.10E+00 |
| + | | KR-85 | 513.99 | | 0.43 | 2.29E+01 | 2.44E+01 | 2.44E+01 |
| + | | SR-85 | 513.99 | | 99.27 | 2.84E-01 | 3.02E-01 | 3.02E-01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | Y-88 | 898.02 | | 93.40 | -1.38E-01 | 2.17E-01 | 2.18E-01 |
| | | 1836.01 | | 99.38 | 1.31E-01 | | 2.17E-01 |
| + | MO-93 | 263.06 | | 56.72 | 2.32E-02 | 7.83E-02 | 1.07E-01 |
| | | 684.67 | | 99.68 | 2.97E-02 | | 1.03E-01 |
| | | 1477.11 | | 99.08 | 1.50E-02 | | 7.83E-02 |
| + | NB-93M | 16.57 | | 9.43 | 1.34E+01 | 7.05E+00 | 7.05E+00 |
| + | NB-94 | 702.63 | | 100.00 | 1.23E-02 | 9.59E-02 | 9.59E-02 |
| | | 871.10 | | 100.00 | 1.43E-03 | | 1.02E-01 |
| + | NB-95 | 765.79 | | 99.81 | 4.65E-01 | 8.46E-01 | 8.46E-01 |
| + | NB-95M | 235.69 | | 25.00 | 1.33E+08 | 7.55E+07 | 7.55E+07 |
| + | ZR-95 | 724.18 | | 43.70 | 4.57E-01 | 5.55E-01 | 8.31E-01 |
| | | 756.72 | | 55.30 | 6.65E-02 | | 5.55E-01 |
| + | MO-99 | 181.06 | | 6.20 | -4.37E+09 | 6.00E+10 | 6.35E+10 |
| | | 739.58 | | 12.80 | 1.80E+10 | | 6.00E+10 |
| | | 778.00 | | 4.50 | -9.38E+10 | | 1.65E+11 |
| + | RU-103 | 497.08 | | 89.00 | 4.91E-02 | 4.75E-01 | 4.75E-01 |
| + | RU-106 | 621.84 | | 9.80 | -1.56E-01 | 1.01E+00 | 1.01E+00 |
| + | AG-108M | 433.93 | | 89.90 | 7.43E-03 | 8.49E-02 | 8.49E-02 |
| | | 614.37 | | 90.40 | -1.77E-02 | | 1.03E-01 |
| | | 722.95 | | 90.50 | -6.28E-02 | | 1.30E-01 |
| + | CD-109 | 88.03 | | 3.72 | 1.24E-01 | 2.10E+00 | 2.10E+00 |
| + | AG-110M | 657.75 | | 93.14 | -3.18E-03 | 1.61E-01 | 1.61E-01 |
| | | 677.61 | | 10.53 | -2.70E-01 | | 1.29E+00 |
| | | 706.67 | | 16.46 | -4.97E-01 | | 7.49E-01 |
| | | 763.93 | | 21.98 | -1.60E-01 | | 6.51E-01 |
| | | 884.67 | | 71.63 | 7.72E-02 | | 2.05E-01 |
| | | 1384.27 | | 23.94 | 4.92E-02 | | 6.49E-01 |
| + | CD-113M | 263.70 | | 0.02 | 4.61E+01 | 2.64E+02 | 2.64E+02 |
| + | SN-113 | 255.12 | | 1.93 | 1.51E+00 | 1.96E-01 | 5.61E+00 |
| | | 391.69 | | 64.90 | -4.54E-02 | | 1.96E-01 |
| + | TE123M | 159.00 | | 84.10 | -3.42E-02 | 1.14E-01 | 1.14E-01 |
| + | SB-124 | 602.71 | | 97.87 | -4.21E-02 | 2.72E-01 | 2.72E-01 |
| | | 645.85 | | 7.26 | -1.59E+00 | | 3.42E+00 |
| | | 722.78 | | 11.10 | -1.60E+00 | | 3.32E+00 |
| | | 1691.02 | | 49.00 | 1.33E-01 | | 5.78E-01 |
| + | I-125 | 35.49 | | 6.49 | -4.81E-01 | 4.61E+00 | 4.61E+00 |
| + | SB-125 | 176.33 | | 6.89 | -1.10E-01 | 2.69E-01 | 8.33E-01 |
| | | 427.89 | | 29.33 | -1.90E-03 | | 2.69E-01 |
| | | 463.38 | | 10.35 | 3.45E-01 | | 9.01E-01 |
| | | 600.56 | | 17.80 | -1.54E-01 | | 4.89E-01 |
| | | 635.90 | | 11.32 | 3.32E-01 | | 7.76E-01 |
| + | SB-126 | 414.70 | | 83.30 | -1.36E+00 | 2.09E+01 | 2.09E+01 |
| | | 666.33 | | 99.60 | -1.25E+00 | | 2.76E+01 |
| | | 695.00 | | 99.60 | 7.48E+00 | | 2.51E+01 |
| | | 720.50 | | 53.80 | -2.90E+01 | | 5.31E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 1.58E-01 | 1.86E-01 | 1.86E-01 |
| + | SB-127 | 473.00 | | 25.00 | 7.93E+06 | 1.61E+07 | 1.85E+07 |
| | | 685.20 | | 35.70 | 4.66E+06 | | 1.61E+07 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | SB-127 | 783.80 | | 14.70 | 1.60E+07 | 1.61E+07 | 4.44E+07 |
| + | I-129 | 29.78 | | 57.00 | -1.03E-01 | 2.43E-01 | 2.43E-01 |
| | | 33.60 | | 13.20 | 2.01E-01 | | 8.22E-01 |
| | | 39.58 | | 7.52 | -2.74E-01 | | 1.06E+00 |
| + | I-131 | 284.30 | | 6.05 | 1.34E+03 | 4.26E+02 | 5.22E+03 |
| | | 364.48 | | 81.20 | -3.34E+02 | | 4.26E+02 |
| | | 636.97 | | 7.26 | -2.43E+03 | | 5.44E+03 |
| | | 722.89 | | 1.80 | -1.63E+04 | | 3.39E+04 |
| + | TE-132 | 49.72 | | 13.10 | 6.37E+07 | 9.78E+07 | 7.66E+08 |
| | | 228.16 | | 88.00 | -2.83E+07 | | 9.78E+07 |
| + | BA-133 | 81.00 | | 33.00 | -5.38E-01 | 1.50E-01 | 2.09E-01 |
| | | 302.84 | | 17.80 | 3.22E-02 | | 3.71E-01 |
| | | 356.01 | | 60.00 | -9.69E-03 | | 1.50E-01 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -2.28E+05 | 8.84E+04 | 8.84E+04 |
| + | CS-134 | 563.23 | | 8.38 | -2.69E-01 | 1.12E-01 | 1.10E+00 |
| | | 569.32 | | 15.43 | 1.21E-01 | | 6.24E-01 |
| | | 604.70 | | 97.60 | -2.58E-03 | | 1.12E-01 |
| | | 795.84 | | 85.40 | 9.50E-02 | | 1.46E-01 |
| | | 801.93 | | 8.73 | -8.34E-02 | | 1.34E+00 |
| + | CS-135 | 268.24 | | 16.00 | 3.06E-01 | 4.11E-01 | 4.11E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | -4.16E+00 | 1.83E+01 | 1.34E+02 |
| | | 163.89 | | 4.61 | 9.56E+01 | | 2.22E+02 |
| | | 176.55 | | 13.56 | -1.85E+01 | | 7.26E+01 |
| | | 273.65 | | 12.66 | -1.45E+00 | | 9.77E+01 |
| | | 340.57 | | 48.50 | 2.27E+01 | | 3.18E+01 |
| | | 818.50 | | 99.70 | -5.12E+00 | | 1.83E+01 |
| | | 1048.07 | | 79.60 | 4.67E+00 | | 2.76E+01 |
| | | 1235.34 | | 19.70 | 1.10E+01 | | 1.62E+02 |
| + | CS-137 | 661.65 | * | 85.12 | 2.01E-01 | 1.63E-01 | 1.63E-01 |
| + | LA-138 | 788.74 | | 34.00 | -1.09E-01 | 1.72E-01 | 3.27E-01 |
| | | 1435.80 | | 66.00 | 2.55E-02 | | 1.72E-01 |
| + | CE-139 | 165.85 | | 80.35 | -3.51E-02 | 1.09E-01 | 1.09E-01 |
| + | BA-140 | 162.64 | | 6.70 | 3.89E+01 | 6.82E+01 | 1.77E+02 |
| | | 304.84 | | 4.50 | -1.47E+02 | | 2.89E+02 |
| | | 423.70 | | 3.20 | -7.04E+01 | | 4.48E+02 |
| | | 437.55 | | 2.00 | 3.78E+02 | | 8.49E+02 |
| | | 537.32 | | 25.00 | 2.76E+01 | | 6.82E+01 |
| + | LA-140 | 328.77 | | 20.50 | -1.57E+01 | 2.79E+01 | 7.57E+01 |
| | | 487.03 | | 45.50 | -2.86E-01 | | 3.51E+01 |
| | | 815.85 | | 23.50 | -4.08E+01 | | 9.18E+01 |
| | | 1596.49 | | 95.49 | 2.10E+00 | | 2.79E+01 |
| + | CE-141 | 145.44 | | 48.40 | 5.53E-01 | 9.88E-01 | 9.88E-01 |
| + | @ CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | CE-144 | 133.54 | | 10.80 | -2.90E-01 | 6.12E-01 | 6.12E-01 |
| + | PM-144 | 476.78 | | 42.00 | -4.39E-02 | 1.09E-01 | 2.19E-01 |
| | | 618.01 | | 98.60 | 5.10E-02 | | 1.09E-01 |
| | | 696.49 | | 99.49 | -1.39E-02 | | 1.19E-01 |
| + | PM-145 | 36.85 | | 21.70 | 3.68E-02 | 2.23E-01 | 4.18E-01 |
| | | 37.36 | | 39.70 | 1.96E-02 | | 2.23E-01 |
| | | 42.30 | | 15.10 | -1.11E-01 | | 5.00E-01 |
| | | 72.40 | | 2.31 | 4.61E-01 | | 3.27E+00 |
| + | PM-146 | 453.90 | | 39.94 | -8.73E-02 | 1.76E-01 | 1.76E-01 |
| | | 735.90 | | 14.01 | -1.38E-01 | | 7.65E-01 |
| | | 747.13 | | 13.10 | -2.77E-01 | | 7.97E-01 |
| + | ND-147 | 91.11 | | 28.90 | 1.81E+02 | 1.24E+02 | 1.24E+02 |
| | | 531.02 | | 13.10 | 4.28E+01 | | 3.04E+02 |
| + | PM-149 | 285.90 | | 3.10 | 3.02E+13 | 6.46E+13 | 6.46E+13 |
| + | EU-152 | 121.78 | | 20.50 | -5.68E-02 | 2.53E-01 | 2.53E-01 |
| | | 244.69 | | 5.40 | -1.83E-01 | | 1.27E+00 |
| | | 344.27 | | 19.13 | 8.23E-02 | | 3.65E-01 |
| | | 778.89 | | 9.20 | -4.19E-01 | | 1.15E+00 |
| | | 964.01 | | 10.40 | 3.03E-01 | | 1.43E+00 |
| | | 1085.78 | | 7.22 | -5.39E-01 | | 1.82E+00 |
| | | 1112.02 | | 9.60 | -2.64E-01 | | 1.26E+00 |
| | | 1407.95 | | 14.94 | -1.27E-01 | | 7.59E-01 |
| + | GD-153 | 97.43 | | 31.30 | 5.42E-02 | 2.29E-01 | 2.29E-01 |
| | | 103.18 | | 22.20 | -5.08E-02 | | 2.92E-01 |
| + | EU-154 | 123.07 | | 40.50 | -3.22E-02 | 1.30E-01 | 1.30E-01 |
| | | 723.30 | | 19.70 | 3.54E-01 | | 6.42E-01 |
| | | 873.19 | | 11.50 | 1.95E-01 | | 8.75E-01 |
| | | 996.32 | | 10.30 | 1.33E-01 | | 1.09E+00 |
| | | 1004.76 | | 17.90 | 7.30E-02 | | 6.43E-01 |
| | | 1274.45 | | 35.50 | 7.26E-02 | | 4.33E-01 |
| + | EU-155 | 86.50 | * | 30.90 | 1.96E-01 | 2.31E-01 | 2.31E-01 |
| | | 105.30 | * | 20.70 | 1.30E-01 | | 2.40E-01 |
| + | EU-156 | 811.77 | | 10.40 | 1.72E+01 | 9.62E+01 | 9.62E+01 |
| | | 1153.47 | | 7.20 | 4.30E+01 | | 1.89E+02 |
| | | 1230.71 | | 8.90 | 3.47E+01 | | 1.56E+02 |
| + | HO-166M | 184.41 | | 72.60 | 9.81E-02 | 8.64E-02 | 8.64E-02 |
| | | 280.45 | | 29.60 | -2.63E-02 | | 2.18E-01 |
| | | 410.94 | | 11.10 | 2.36E-01 | | 6.86E-01 |
| | | 711.69 | | 54.10 | -8.62E-02 | | 1.82E-01 |
| + | TM-171 | 66.72 | | 0.14 | -2.07E+01 | 5.34E+01 | 5.34E+01 |
| + | HF-172 | 67.35 | | 5.31 | -5.45E-01 | 5.25E-01 | 1.41E+00 |
| | | 125.81 | | 11.30 | 5.34E-02 | | 5.25E-01 |
| + | LU-172 | 181.53 | | 20.60 | -1.07E+02 | 6.09E+03 | 7.81E+03 |
| | | 900.72 | | 29.81 | 1.83E+03 | | 1.14E+04 |
| | | 1093.66 | | 62.50 | -1.26E+03 | | 6.09E+03 |
| + | LU-173 | 100.72 | | 5.24 | -3.13E-01 | 3.61E-01 | 1.05E+00 |
| | | 272.11 | | 21.20 | 1.36E-01 | | 3.61E-01 |
| + | HF-175 | 343.40 | | 84.00 | 4.92E-02 | 2.18E-01 | 2.18E-01 |
| + | LU-176 | 88.34 | | 13.30 | 2.99E-02 | 6.40E-02 | 5.08E-01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | LU-176 | 201.83 | | 86.00 | -1.05E-02 | 6.40E-02 | 6.81E-02 |
| | | 306.78 | | 94.00 | -1.91E-02 | | 6.40E-02 |
| + | HF-181 | 133.02 | | 41.70 | -2.50E-01 | 4.88E-01 | 6.37E-01 |
| | | 345.85 | | 17.20 | 4.59E-01 | | 1.97E+00 |
| | | 482.03 | | 82.80 | 2.23E-01 | | 4.88E-01 |
| + | TA-182 | 67.75 | | 41.20 | -1.71E-01 | 2.98E-01 | 2.98E-01 |
| | | 1121.30 | | 34.90 | 8.16E-01 | | 8.96E-01 |
| | | 1189.05 | | 16.23 | -4.47E-01 | | 1.42E+00 |
| | | 1221.41 | | 26.98 | 2.46E-01 | | 1.01E+00 |
| | | 1231.02 | | 11.44 | 4.02E-01 | | 2.42E+00 |
| + | IR-192 | 308.46 | | 29.68 | 2.05E-02 | 4.32E-01 | 5.23E-01 |
| | | 468.07 | | 48.10 | -2.19E-01 | | 4.32E-01 |
| + | HG-203 | 279.19 | * | 77.30 | 2.51E-01 | 3.89E-01 | 3.89E-01 |
| + | TL-204 | 374.74 | | 94.11 | -1.56E-02 | 7.59E-02 | 7.59E-02 |
| | | 899.15 | | 99.16 | 2.80E-02 | | 1.23E-01 |
| | | 911.74 | | 91.10 | 2.98E-01 | | 1.96E-01 |
| + | BI-207 | 569.67 | | 97.72 | 1.75E-02 | 9.05E-02 | 9.05E-02 |
| | | 1063.62 | | 74.90 | -4.30E-02 | | 1.65E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 9.28E-01 | 4.86E-01 | 4.86E-01 |
| | | 860.37 | | 4.48 | 7.60E-01 | | 2.53E+00 |
| | | 2614.66 | | 35.85 | 1.15E+00 | | 8.39E-01 |
| + | BI-210M | 262.00 | | 45.00 | -7.94E-02 | 1.28E-01 | 1.28E-01 |
| | | 300.00 | | 23.00 | -4.09E-01 | | 3.08E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 1.36E+00 | 2.05E+00 | 2.05E+00 |
| + | PB-211 | 404.84 | | 2.90 | 3.44E-02 | 2.63E+00 | 2.63E+00 |
| | | 831.96 | | 2.90 | 2.03E+00 | | 3.95E+00 |
| + | BI-212 | 727.17 | | 11.80 | 3.00E-01 | 1.01E+00 | 1.01E+00 |
| | | 1620.62 | | 2.75 | -6.65E-01 | | 2.88E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.19E+00 | 2.58E-01 | 2.58E-01 |
| | | 300.09 | | 3.41 | -2.76E+00 | | 2.08E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 8.44E-01 | 2.58E-01 | 2.58E-01 |
| | | 1120.29 | * | 15.10 | 9.22E-01 | | 1.21E+00 |
| | | 1764.49 | * | 15.80 | 8.12E-01 | | 4.45E-01 |
| | | 2204.22 | | 4.98 | -1.18E-01 | | 2.06E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 8.98E-01 | 2.55E-01 | 5.94E-01 |
| | | 351.92 | * | 37.19 | 7.46E-01 | | 2.55E-01 |
| + | RN-219 | 401.80 | | 6.50 | 1.03E-02 | 1.14E+00 | 1.14E+00 |
| + | RA-223 | 323.87 | | 3.88 | -6.69E-01 | 1.70E+00 | 1.70E+00 |
| + | RA-224 | 240.98 | | 3.95 | 1.18E+01 | 2.87E+00 | 2.87E+00 |
| + | RA-225 | 40.00 | | 31.00 | -6.81E+00 | 2.65E+01 | 2.65E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.77E+00 | 2.63E+00 | 2.63E+00 |
| + | TH-227 | 50.10 | | 8.40 | 6.72E-02 | 8.09E-01 | 8.09E-01 |
| | | 236.00 | | 11.50 | 1.54E+00 | | 8.76E-01 |
| | | 256.20 | | 6.30 | 1.20E-01 | | 9.56E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.04E+00 | 4.98E-01 | 8.21E-01 |
| | | 911.07 | * | 27.70 | 8.83E-01 | | 4.98E-01 |
| | | 969.11 | * | 16.60 | 1.38E+00 | | 1.07E+00 |
| + | TH-230 | 48.44 | | 16.90 | -4.02E-02 | 4.18E-01 | 4.18E-01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | TH-230 | 62.85 | | 4.60 | 9.37E-01 | 4.18E-01 | 1.51E+00 |
| | | 67.67 | | 0.37 | -1.04E+01 | | 1.82E+01 |
| + | PA-231 | 283.67 | | 1.60 | 9.74E-01 | 2.82E+00 | 3.80E+00 |
| | | 302.67 | | 2.30 | 2.45E-01 | | 2.82E+00 |
| + | TH-231 | 25.64 | | 14.70 | -1.63E-01 | 1.01E+00 | 1.40E+00 |
| | | 84.21 | | 6.40 | -1.30E-01 | | 1.01E+00 |
| + | PA-233 | 311.98 | | 38.60 | 1.69E-01 | 2.12E+00 | 2.12E+00 |
| + | PA-234 | 131.20 | | 20.40 | 3.32E-02 | 2.63E-01 | 2.63E-01 |
| | | 733.99 | | 8.80 | -1.10E+00 | | 1.12E+00 |
| | | 946.00 | | 12.00 | 2.35E-01 | | 8.90E-01 |
| + | PA-234M | 1001.03 | | 0.92 | -7.23E+00 | 1.16E+01 | 1.16E+01 |
| + | TH-234 | 63.29 | | 3.80 | 1.13E+00 | 1.82E+00 | 1.82E+00 |
| + | U-235 | 143.76 | | 10.50 | 2.83E-01 | 5.42E-01 | 5.42E-01 |
| | | 163.35 | | 4.70 | 2.57E-01 | | 1.17E+00 |
| | | 205.31 | | 4.70 | -1.04E-01 | | 1.29E+00 |
| + | NP-237 | 86.50 | * | 12.60 | 4.63E-01 | 5.45E-01 | 5.45E-01 |
| + | NP-239 | 106.10 | | 22.70 | -2.36E+11 | 1.05E+12 | 1.05E+12 |
| | | 228.18 | | 10.70 | -7.64E+11 | | 2.64E+12 |
| | | 277.60 | | 14.10 | 1.40E+12 | | 2.31E+12 |
| + | AM-241 | 59.54 | | 35.90 | -1.90E-03 | 1.94E-01 | 1.94E-01 |
| + | AM-243 | 74.67 | | 66.00 | 5.03E-01 | 1.34E-01 | 1.34E-01 |
| + | CM-243 | 209.75 | * | 3.29 | 1.73E+00 | 4.94E-01 | 2.70E+00 |
| | | 228.14 | | 10.60 | -1.62E-01 | | 5.58E-01 |
| | | 277.60 | * | 14.00 | 3.19E-01 | | 4.94E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 2.66E+00 | 2.66E+00 | -9.97E-01 | 1.25E+00 |
| | NA-22 | 1274.54 | | 99.94 | 1.62E-01 | 1.62E-01 | 2.71E-02 | 7.52E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 8.81E-02 | 8.81E-02 | 2.41E-02 | 3.65E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.28E+00 | 1.28E+00 | 1.59E+01 | 5.82E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 7.14E-02 | 7.14E-02 | -4.10E-02 | 3.50E-02 |
| | | 78.34 | | 96.00 | 8.88E-02 | | 3.26E-01 | 4.37E-02 |
| | SC-46 | 889.25 | | 99.98 | 2.53E-01 | 2.53E-01 | 2.96E-02 | 1.18E-01 |
| | | 1120.51 | | 99.99 | 3.95E-01 | | 3.83E-01 | 1.87E-01 |
| | V-48 | 983.52 | | 99.98 | 9.19E+00 | 9.19E+00 | 7.30E+00 | 4.27E+00 |
| | | 1312.10 | | 97.50 | 9.95E+00 | | -2.50E+00 | 4.55E+00 |
| | CR-51 | 320.08 | | 9.83 | 7.68E+00 | 7.68E+00 | -3.19E+00 | 3.66E+00 |
| | MN-54 | 834.83 | | 99.97 | 1.46E-01 | 1.46E-01 | 4.77E-02 | 6.83E-02 |
| | CO-56 | 846.75 | | 99.96 | 2.53E-01 | 2.53E-01 | 1.56E-02 | 1.18E-01 |
| | | 1037.75 | | 14.03 | 2.04E+00 | | 8.01E-01 | 9.41E-01 |
| | | 1238.25 | | 67.00 | 6.27E-01 | | 1.66E-01 | 2.95E-01 |
| | | 1771.40 | | 15.51 | 1.10E+00 | | -8.38E-02 | 4.36E-01 |
| | | 2598.48 | | 16.90 | 1.10E+00 | | 5.93E-02 | 3.90E-01 |
| | CO-57 | 122.06 | | 85.51 | 7.73E-02 | 7.73E-02 | -1.73E-02 | 3.77E-02 |
| | | 136.48 | | 10.60 | 6.30E-01 | | -7.35E-02 | 3.07E-01 |
| | CO-58 | 810.76 | | 99.40 | 2.91E-01 | 2.91E-01 | 2.56E-03 | 1.36E-01 |
| | FE-59 | 1099.22 | | 56.50 | 9.88E-01 | 9.88E-01 | -1.39E-01 | 4.55E-01 |
| | | 1291.56 | | 43.20 | 1.26E+00 | | -3.64E-01 | 5.68E-01 |
| | CO-60 | 1173.22 | | 100.00 | 1.51E-01 | 1.02E-01 | 4.59E-02 | 7.03E-02 |
| | | 1332.49 | | 100.00 | 1.02E-01 | | -4.35E-02 | 4.50E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 3.93E-01 | 3.93E-01 | 4.90E-03 | 1.84E-01 |
| | GA-67 | 93.31 | | 35.70 | 2.60E+08 | 2.60E+08 | 2.89E+08 | 1.28E+08 |
| | | 208.95 | | 2.24 | 4.40E+09 | | 3.65E+09 | 2.14E+09 |
| | | 300.22 | | 16.00 | 6.39E+08 | | -8.47E+08 | 3.07E+08 |
| | SE-75 | 121.11 | | 16.70 | 5.49E-01 | 1.55E-01 | 8.78E-02 | 2.67E-01 |
| | | 136.00 | | 59.20 | 1.55E-01 | | -7.05E-02 | 7.54E-02 |
| | | 264.65 | | 59.80 | 1.72E-01 | | -1.27E-01 | 8.25E-02 |
| | | 279.53 | | 25.20 | 4.79E-01 | | 3.74E-01 | 2.31E-01 |
| | | 400.65 | | 11.40 | 1.16E+00 | | 3.55E-01 | 5.54E-01 |
| | RB-82 | 776.52 | | 13.00 | 1.18E+01 | 1.18E+01 | -3.09E+00 | 5.49E+00 |
| | RB-83 | 520.41 | | 46.00 | 3.38E-01 | 3.38E-01 | -1.36E-01 | 1.57E-01 |
| | | 529.64 | | 30.30 | 5.37E-01 | | -1.28E-01 | 2.51E-01 |
| | | 552.65 | | 16.40 | 1.10E+00 | | 5.87E-01 | 5.18E-01 |
| | KR-85 | 513.99 | | 0.43 | 2.44E+01 | 2.44E+01 | 2.29E+01 | 1.16E+01 |
| | SR-85 | 513.99 | | 99.27 | 3.02E-01 | 3.02E-01 | 2.84E-01 | 1.44E-01 |
| | Y-88 | 898.02 | | 93.40 | 2.18E-01 | 2.17E-01 | -1.38E-01 | 1.01E-01 |
| | | 1836.01 | | 99.38 | 2.17E-01 | | 1.31E-01 | 9.39E-02 |
| | MO-93 | 263.06 | | 56.72 | 1.07E-01 | 7.83E-02 | 2.32E-02 | 5.14E-02 |
| | | 684.67 | | 99.68 | 1.03E-01 | | 2.97E-02 | 4.81E-02 |
| | | 1477.11 | | 99.08 | 7.83E-02 | | 1.50E-02 | 3.28E-02 |
| | NB-93M | 16.57 | | 9.43 | 7.05E+00 | 7.05E+00 | 1.34E+01 | 3.42E+00 |
| | NB-94 | 702.63 | | 100.00 | 9.59E-02 | 9.59E-02 | 1.23E-02 | 4.48E-02 |
| | | 871.10 | | 100.00 | 1.02E-01 | | 1.43E-03 | 4.72E-02 |
| | NB-95 | 765.79 | | 99.81 | 8.46E-01 | 8.46E-01 | 4.65E-01 | 3.98E-01 |
| | NB-95M | 235.69 | | 25.00 | 7.55E+07 | 7.55E+07 | 1.33E+08 | 3.69E+07 |
| | ZR-95 | 724.18 | | 43.70 | 8.31E-01 | 5.55E-01 | 4.57E-01 | 3.94E-01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|
| ZR-95 | 756.72 | | 55.30 | 5.55E-01 | 5.55E-01 | 6.65E-02 | 2.60E-01 |
| MO-99 | 181.06 | | 6.20 | 6.35E+10 | 6.00E+10 | -4.37E+09 | 3.08E+10 |
| | 739.58 | | 12.80 | 6.00E+10 | | 1.80E+10 | 2.81E+10 |
| | 778.00 | | 4.50 | 1.65E+11 | | -9.38E+10 | 7.70E+10 |
| RU-103 | 497.08 | | 89.00 | 4.75E-01 | 4.75E-01 | 4.91E-02 | 2.23E-01 |
| RU-106 | 621.84 | | 9.80 | 1.01E+00 | 1.01E+00 | -1.56E-01 | 4.71E-01 |
| AG-108M | 433.93 | | 89.90 | 8.49E-02 | 8.49E-02 | 7.43E-03 | 4.03E-02 |
| | 614.37 | | 90.40 | 1.03E-01 | | -1.77E-02 | 4.82E-02 |
| | 722.95 | | 90.50 | 1.30E-01 | | -6.28E-02 | 6.15E-02 |
| CD-109 | 88.03 | | 3.72 | 2.10E+00 | 2.10E+00 | 1.24E-01 | 1.03E+00 |
| AG-110M | 657.75 | | 93.14 | 1.61E-01 | 1.61E-01 | -3.18E-03 | 7.61E-02 |
| | 677.61 | | 10.53 | 1.29E+00 | | -2.70E-01 | 6.09E-01 |
| | 706.67 | | 16.46 | 7.49E-01 | | -4.97E-01 | 3.49E-01 |
| | 763.93 | | 21.98 | 6.51E-01 | | -1.60E-01 | 3.05E-01 |
| | 884.67 | | 71.63 | 2.05E-01 | | 7.72E-02 | 9.55E-02 |
| | 1384.27 | | 23.94 | 6.49E-01 | | 4.92E-02 | 2.92E-01 |
| CD-113M | 263.70 | | 0.02 | 2.64E+02 | 2.64E+02 | 4.61E+01 | 1.27E+02 |
| SN-113 | 255.12 | | 1.93 | 5.61E+00 | 1.96E-01 | 1.51E+00 | 2.70E+00 |
| | 391.69 | | 64.90 | 1.96E-01 | | -4.54E-02 | 9.31E-02 |
| TE123M | 159.00 | | 84.10 | 1.14E-01 | 1.14E-01 | -3.42E-02 | 5.54E-02 |
| SB-124 | 602.71 | | 97.87 | 2.72E-01 | 2.72E-01 | -4.21E-02 | 1.27E-01 |
| | 645.85 | | 7.26 | 3.42E+00 | | -1.59E+00 | 1.59E+00 |
| | 722.78 | | 11.10 | 3.32E+00 | | -1.60E+00 | 1.57E+00 |
| | 1691.02 | | 49.00 | 5.78E-01 | | 1.33E-01 | 2.44E-01 |
| I-125 | 35.49 | | 6.49 | 4.61E+00 | 4.61E+00 | -4.81E-01 | 2.24E+00 |
| SB-125 | 176.33 | | 6.89 | 8.33E-01 | 2.69E-01 | -1.10E-01 | 4.04E-01 |
| | 427.89 | | 29.33 | 2.69E-01 | | -1.90E-03 | 1.27E-01 |
| | 463.38 | | 10.35 | 9.01E-01 | | 3.45E-01 | 4.29E-01 |
| | 600.56 | | 17.80 | 4.89E-01 | | -1.54E-01 | 2.28E-01 |
| | 635.90 | | 11.32 | 7.76E-01 | | 3.32E-01 | 3.61E-01 |
| SB-126 | 414.70 | | 83.30 | 2.09E+01 | 2.09E+01 | -1.36E+00 | 9.89E+00 |
| | 666.33 | | 99.60 | 2.76E+01 | | -1.25E+00 | 1.30E+01 |
| | 695.00 | | 99.60 | 2.51E+01 | | 7.48E+00 | 1.17E+01 |
| | 720.50 | | 53.80 | 5.31E+01 | | -2.90E+01 | 2.50E+01 |
| SN-126 | 87.57 | * | 37.00 | 1.86E-01 | 1.86E-01 | 1.58E-01 | 9.11E-02 |
| SB-127 | 473.00 | | 25.00 | 1.85E+07 | 1.61E+07 | 7.93E+06 | 8.76E+06 |
| | 685.20 | | 35.70 | 1.61E+07 | | 4.66E+06 | 7.56E+06 |
| | 783.80 | | 14.70 | 4.44E+07 | | 1.60E+07 | 2.08E+07 |
| I-129 | 29.78 | | 57.00 | 2.43E-01 | 2.43E-01 | -1.03E-01 | 1.18E-01 |
| | 33.60 | | 13.20 | 8.22E-01 | | 2.01E-01 | 4.00E-01 |
| | 39.58 | | 7.52 | 1.06E+00 | | -2.74E-01 | 5.17E-01 |
| I-131 | 284.30 | | 6.05 | 5.22E+03 | 4.26E+02 | 1.34E+03 | 2.50E+03 |
| | 364.48 | | 81.20 | 4.26E+02 | | -3.34E+02 | 2.03E+02 |
| | 636.97 | | 7.26 | 5.44E+03 | | -2.43E+03 | 2.51E+03 |
| | 722.89 | | 1.80 | 3.39E+04 | | -1.63E+04 | 1.60E+04 |
| TE-132 | 49.72 | | 13.10 | 7.66E+08 | 9.78E+07 | 6.37E+07 | 3.74E+08 |
| | 228.16 | | 88.00 | 9.78E+07 | | -2.83E+07 | 4.72E+07 |
| BA-133 | 81.00 | | 33.00 | 2.09E-01 | 1.50E-01 | -5.38E-01 | 1.02E-01 |
| | 302.84 | | 17.80 | 3.71E-01 | | 3.22E-02 | 1.78E-01 |
| | 356.01 | | 60.00 | 1.50E-01 | | -9.69E-03 | 7.24E-02 |
| @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| XE-133 | 81.00 | | 38.00 | 8.84E+04 | 8.84E+04 | -2.28E+05 | 4.34E+04 |
| CS-134 | 563.23 | | 8.38 | 1.10E+00 | 1.12E-01 | -2.69E-01 | 5.16E-01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | CS-134 | 569.32 | | 15.43 | 6.24E-01 | 1.12E-01 | 1.21E-01 | 2.94E-01 |
| | | 604.70 | | 97.60 | 1.12E-01 | | -2.58E-03 | 5.31E-02 |
| | | 795.84 | | 85.40 | 1.46E-01 | | 9.50E-02 | 6.82E-02 |
| | | 801.93 | | 8.73 | 1.34E+00 | | -8.34E-02 | 6.26E-01 |
| | CS-135 | 268.24 | | 16.00 | 4.11E-01 | 4.11E-01 | 3.06E-01 | 1.98E-01 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CS-136 | 153.22 | | 7.46 | 1.34E+02 | 1.83E+01 | -4.16E+00 | 6.52E+01 |
| | | 163.89 | | 4.61 | 2.22E+02 | | 9.56E+01 | 1.08E+02 |
| | | 176.55 | | 13.56 | 7.26E+01 | | -1.85E+01 | 3.52E+01 |
| | | 273.65 | | 12.66 | 9.77E+01 | | -1.45E+00 | 4.71E+01 |
| | | 340.57 | | 48.50 | 3.18E+01 | | 2.27E+01 | 1.53E+01 |
| | | 818.50 | | 99.70 | 1.83E+01 | | -5.12E+00 | 8.48E+00 |
| | | 1048.07 | | 79.60 | 2.76E+01 | | 4.67E+00 | 1.27E+01 |
| | | 1235.34 | | 19.70 | 1.62E+02 | | 1.10E+01 | 7.62E+01 |
| + | CS-137 | 661.65 | * | 85.12 | 1.63E-01 | 1.63E-01 | 2.01E-01 | 7.80E-02 |
| | LA-138 | 788.74 | | 34.00 | 3.27E-01 | 1.72E-01 | -1.09E-01 | 1.53E-01 |
| | | 1435.80 | | 66.00 | 1.72E-01 | | 2.55E-02 | 7.70E-02 |
| | CE-139 | 165.85 | | 80.35 | 1.09E-01 | 1.09E-01 | -3.51E-02 | 5.31E-02 |
| | BA-140 | 162.64 | | 6.70 | 1.77E+02 | 6.82E+01 | 3.89E+01 | 8.60E+01 |
| | | 304.84 | | 4.50 | 2.89E+02 | | -1.47E+02 | 1.38E+02 |
| | | 423.70 | | 3.20 | 4.48E+02 | | -7.04E+01 | 2.11E+02 |
| | | 437.55 | | 2.00 | 8.49E+02 | | 3.78E+02 | 4.03E+02 |
| | | 537.32 | | 25.00 | 6.82E+01 | | 2.76E+01 | 3.20E+01 |
| | LA-140 | 328.77 | | 20.50 | 7.57E+01 | 2.79E+01 | -1.57E+01 | 3.63E+01 |
| | | 487.03 | | 45.50 | 3.51E+01 | | -2.86E-01 | 1.65E+01 |
| | | 815.85 | | 23.50 | 9.18E+01 | | -4.08E+01 | 4.25E+01 |
| | | 1596.49 | | 95.49 | 2.79E+01 | | 2.10E+00 | 1.24E+01 |
| | CE-141 | 145.44 | | 48.40 | 9.88E-01 | 9.88E-01 | 5.53E-01 | 4.81E-01 |
| @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-144 | 133.54 | | 10.80 | 6.12E-01 | 6.12E-01 | -2.90E-01 | 2.98E-01 |
| | PM-144 | 476.78 | | 42.00 | 2.19E-01 | 1.09E-01 | -4.39E-02 | 1.04E-01 |
| | | 618.01 | | 98.60 | 1.09E-01 | | 5.10E-02 | 5.10E-02 |
| | | 696.49 | | 99.49 | 1.19E-01 | | -1.39E-02 | 5.55E-02 |
| | PM-145 | 36.85 | | 21.70 | 4.18E-01 | 2.23E-01 | 3.68E-02 | 2.03E-01 |
| | | 37.36 | | 39.70 | 2.23E-01 | | 1.96E-02 | 1.09E-01 |
| | | 42.30 | | 15.10 | 5.00E-01 | | -1.11E-01 | 2.43E-01 |
| | | 72.40 | | 2.31 | 3.27E+00 | | 4.61E-01 | 1.61E+00 |
| | PM-146 | 453.90 | | 39.94 | 1.76E-01 | 1.76E-01 | -8.73E-02 | 8.27E-02 |
| | | 735.90 | | 14.01 | 7.65E-01 | | -1.38E-01 | 3.58E-01 |
| | | 747.13 | | 13.10 | 7.97E-01 | | -2.77E-01 | 3.72E-01 |
| | ND-147 | 91.11 | | 28.90 | 1.24E+02 | 1.24E+02 | 1.81E+02 | 6.11E+01 |
| | | 531.02 | | 13.10 | 3.04E+02 | | 4.28E+01 | 1.42E+02 |
| | PM-149 | 285.90 | | 3.10 | 6.46E+13 | 6.46E+13 | 3.02E+13 | 3.10E+13 |
| | EU-152 | 121.78 | | 20.50 | 2.53E-01 | 2.53E-01 | -5.68E-02 | 1.23E-01 |
| | | 244.69 | | 5.40 | 1.27E+00 | | -1.83E-01 | 6.14E-01 |
| | | 344.27 | | 19.13 | 3.65E-01 | | 8.23E-02 | 1.74E-01 |
| | | 778.89 | | 9.20 | 1.15E+00 | | -4.19E-01 | 5.35E-01 |
| | | 964.01 | | 10.40 | 1.43E+00 | | 3.03E-01 | 6.72E-01 |
| | | 1085.78 | | 7.22 | 1.82E+00 | | -5.39E-01 | 8.45E-01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | EU-152 | 1112.02 | | 9.60 | 1.26E+00 | 2.53E-01 | -2.64E-01 | 5.80E-01 |
| | | 1407.95 | | 14.94 | 7.59E-01 | | -1.27E-01 | 3.39E-01 |
| | GD-153 | 97.43 | | 31.30 | 2.29E-01 | 2.29E-01 | 5.42E-02 | 1.12E-01 |
| | | 103.18 | | 22.20 | 2.92E-01 | | -5.08E-02 | 1.42E-01 |
| | EU-154 | 123.07 | | 40.50 | 1.30E-01 | 1.30E-01 | -3.22E-02 | 6.35E-02 |
| | | 723.30 | | 19.70 | 6.42E-01 | | 3.54E-01 | 3.04E-01 |
| | | 873.19 | | 11.50 | 8.75E-01 | | 1.95E-01 | 4.03E-01 |
| | | 996.32 | | 10.30 | 1.09E+00 | | 1.33E-01 | 5.00E-01 |
| | | 1004.76 | | 17.90 | 6.43E-01 | | 7.30E-02 | 2.96E-01 |
| | | 1274.45 | | 35.50 | 4.33E-01 | | 7.26E-02 | 2.01E-01 |
| + | EU-155 | 86.50 | * | 30.90 | 2.31E-01 | 2.31E-01 | 1.96E-01 | 1.13E-01 |
| | | 105.30 | * | 20.70 | 2.40E-01 | | 1.30E-01 | 1.17E-01 |
| | EU-156 | 811.77 | | 10.40 | 9.62E+01 | 9.62E+01 | 1.72E+01 | 4.49E+01 |
| | | 1153.47 | | 7.20 | 1.89E+02 | | 4.30E+01 | 8.79E+01 |
| | | 1230.71 | | 8.90 | 1.56E+02 | | 3.47E+01 | 7.23E+01 |
| | HO-166M | 184.41 | | 72.60 | 8.64E-02 | 8.64E-02 | 9.81E-02 | 4.20E-02 |
| | | 280.45 | | 29.60 | 2.18E-01 | | -2.63E-02 | 1.05E-01 |
| | | 410.94 | | 11.10 | 6.86E-01 | | 2.36E-01 | 3.26E-01 |
| | | 711.69 | | 54.10 | 1.82E-01 | | -8.62E-02 | 8.50E-02 |
| | TM-171 | 66.72 | | 0.14 | 5.34E+01 | 5.34E+01 | -2.07E+01 | 2.62E+01 |
| | HF-172 | 67.35 | | 5.31 | 1.41E+00 | 5.25E-01 | -5.45E-01 | 6.89E-01 |
| | | 125.81 | | 11.30 | 5.25E-01 | | 5.34E-02 | 2.56E-01 |
| | LU-172 | 181.53 | | 20.60 | 7.81E+03 | 6.09E+03 | -1.07E+02 | 3.79E+03 |
| | | 900.72 | | 29.81 | 1.14E+04 | | 1.83E+03 | 5.33E+03 |
| | | 1093.66 | | 62.50 | 6.09E+03 | | -1.26E+03 | 2.83E+03 |
| | LU-173 | 100.72 | | 5.24 | 1.05E+00 | 3.61E-01 | -3.13E-01 | 5.09E-01 |
| | | 272.11 | | 21.20 | 3.61E-01 | | 1.36E-01 | 1.74E-01 |
| | HF-175 | 343.40 | | 84.00 | 2.18E-01 | 2.18E-01 | 4.92E-02 | 1.04E-01 |
| | LU-176 | 88.34 | | 13.30 | 5.08E-01 | 6.40E-02 | 2.99E-02 | 2.49E-01 |
| | | 201.83 | | 86.00 | 6.81E-02 | | -1.05E-02 | 3.30E-02 |
| | | 306.78 | | 94.00 | 6.40E-02 | | -1.91E-02 | 3.06E-02 |
| | HF-181 | 133.02 | | 41.70 | 6.37E-01 | 4.88E-01 | -2.50E-01 | 3.10E-01 |
| | | 345.85 | | 17.20 | 1.97E+00 | | 4.59E-01 | 9.40E-01 |
| | | 482.03 | | 82.80 | 4.88E-01 | | 2.23E-01 | 2.31E-01 |
| | TA-182 | 67.75 | | 41.20 | 2.98E-01 | 2.98E-01 | -1.71E-01 | 1.46E-01 |
| | | 1121.30 | | 34.90 | 8.96E-01 | | 8.16E-01 | 4.23E-01 |
| | | 1189.05 | | 16.23 | 1.42E+00 | | -4.47E-01 | 6.55E-01 |
| | | 1221.41 | | 26.98 | 1.01E+00 | | 2.46E-01 | 4.71E-01 |
| | | 1231.02 | | 11.44 | 2.42E+00 | | 4.02E-01 | 1.13E+00 |
| | IR-192 | 308.46 | | 29.68 | 5.23E-01 | 4.32E-01 | 2.05E-02 | 2.50E-01 |
| | | 468.07 | | 48.10 | 4.32E-01 | | -2.19E-01 | 2.05E-01 |
| | HG-203 | 279.19 | * | 77.30 | 3.89E-01 | 3.89E-01 | 2.51E-01 | 1.87E-01 |
| | TL-204 | 374.74 | | 94.11 | 7.59E-02 | 7.59E-02 | -1.56E-02 | 3.60E-02 |
| | | 899.15 | | 99.16 | 1.23E-01 | | 2.80E-02 | 5.73E-02 |
| | | 911.74 | | 91.10 | 1.96E-01 | | 2.98E-01 | 9.32E-02 |
| | BI-207 | 569.67 | | 97.72 | 9.05E-02 | 9.05E-02 | 1.75E-02 | 4.26E-02 |
| | | 1063.62 | | 74.90 | 1.65E-01 | | -4.30E-02 | 7.64E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 4.86E-01 | 4.86E-01 | 9.28E-01 | 2.34E-01 |
| | | 860.37 | | 4.48 | 2.53E+00 | | 7.60E-01 | 1.18E+00 |
| | | 2614.66 | | 35.85 | 8.39E-01 | | 1.15E+00 | 3.88E-01 |
| | BI-210M | 262.00 | | 45.00 | 1.28E-01 | 1.28E-01 | -7.94E-02 | 6.15E-02 |
| | | 300.00 | | 23.00 | 3.08E-01 | | -4.09E-01 | 1.48E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 2.05E+00 | 2.05E+00 | 1.36E+00 | 1.00E+00 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | PB-211 | 404.84 | | 2.90 | 2.63E+00 | 2.63E+00 | 3.44E-02 | 1.25E+00 |
| | | 831.96 | | 2.90 | 3.95E+00 | | 2.03E+00 | 1.85E+00 |
| | BI-212 | 727.17 | | 11.80 | 1.01E+00 | 1.01E+00 | 3.00E-01 | 4.76E-01 |
| | | 1620.62 | | 2.75 | 2.88E+00 | | -6.65E-01 | 1.19E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 2.58E-01 | 2.58E-01 | 1.19E+00 | 1.27E-01 |
| | | 300.09 | | 3.41 | 2.08E+00 | | -2.76E+00 | 1.00E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 2.58E-01 | 2.58E-01 | 8.44E-01 | 1.23E-01 |
| | | 1120.29 | * | 15.10 | 1.21E+00 | | 9.22E-01 | 5.75E-01 |
| | | 1764.49 | * | 15.80 | 4.45E-01 | | 8.12E-01 | 1.76E-01 |
| | | 2204.22 | | 4.98 | 2.06E+00 | | -1.18E-01 | 8.45E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 5.94E-01 | 2.55E-01 | 8.98E-01 | 2.90E-01 |
| | | 351.92 | * | 37.19 | 2.55E-01 | | 7.46E-01 | 1.23E-01 |
| | RN-219 | 401.80 | | 6.50 | 1.14E+00 | 1.14E+00 | 1.03E-02 | 5.44E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.70E+00 | 1.70E+00 | -6.69E-01 | 8.14E-01 |
| | RA-224 | 240.98 | | 3.95 | 2.87E+00 | 2.87E+00 | 1.18E+01 | 1.41E+00 |
| | RA-225 | 40.00 | | 31.00 | 2.65E+01 | 2.65E+01 | -6.81E+00 | 1.29E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.63E+00 | 2.63E+00 | 1.77E+00 | 1.29E+00 |
| | TH-227 | 50.10 | | 8.40 | 8.09E-01 | 8.09E-01 | 6.72E-02 | 3.95E-01 |
| | | 236.00 | | 11.50 | 8.76E-01 | | 1.54E+00 | 4.29E-01 |
| | | 256.20 | | 6.30 | 9.56E-01 | | 1.20E-01 | 4.60E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 8.21E-01 | 4.98E-01 | 1.04E+00 | 3.97E-01 |
| | | 911.07 | * | 27.70 | 4.98E-01 | | 8.83E-01 | 2.34E-01 |
| | | 969.11 | * | 16.60 | 1.07E+00 | | 1.38E+00 | 5.11E-01 |
| | TH-230 | 48.44 | | 16.90 | 4.18E-01 | 4.18E-01 | -4.02E-02 | 2.04E-01 |
| | | 62.85 | | 4.60 | 1.51E+00 | | 9.37E-01 | 7.41E-01 |
| | | 67.67 | | 0.37 | 1.82E+01 | | -1.04E+01 | 8.92E+00 |
| | PA-231 | 283.67 | | 1.60 | 3.80E+00 | 2.82E+00 | 9.74E-01 | 1.82E+00 |
| | | 302.67 | | 2.30 | 2.82E+00 | | 2.45E-01 | 1.35E+00 |
| | TH-231 | 25.64 | | 14.70 | 1.40E+00 | 1.01E+00 | -1.63E-01 | 6.81E-01 |
| | | 84.21 | | 6.40 | 1.01E+00 | | -1.30E-01 | 4.95E-01 |
| | PA-233 | 311.98 | | 38.60 | 2.12E+00 | 2.12E+00 | 1.69E-01 | 1.01E+00 |
| | PA-234 | 131.20 | | 20.40 | 2.63E-01 | 2.63E-01 | 3.32E-02 | 1.28E-01 |
| | | 733.99 | | 8.80 | 1.12E+00 | | -1.10E+00 | 5.22E-01 |
| | | 946.00 | | 12.00 | 8.90E-01 | | 2.35E-01 | 4.10E-01 |
| | PA-234M | 1001.03 | | 0.92 | 1.16E+01 | 1.16E+01 | -7.23E+00 | 5.32E+00 |
| | TH-234 | 63.29 | | 3.80 | 1.82E+00 | 1.82E+00 | 1.13E+00 | 8.94E-01 |
| | U-235 | 143.76 | | 10.50 | 5.42E-01 | 5.42E-01 | 2.83E-01 | 2.64E-01 |
| | | 163.35 | | 4.70 | 1.17E+00 | | 2.57E-01 | 5.68E-01 |
| | | 205.31 | | 4.70 | 1.29E+00 | | -1.04E-01 | 6.27E-01 |
| | NP-237 | 86.50 | * | 12.60 | 5.45E-01 | 5.45E-01 | 4.63E-01 | 2.68E-01 |
| | NP-239 | 106.10 | | 22.70 | 1.05E+12 | 1.05E+12 | -2.36E+11 | 5.10E+11 |
| | | 228.18 | | 10.70 | 2.64E+12 | | -7.64E+11 | 1.27E+12 |
| | | 277.60 | | 14.10 | 2.31E+12 | | 1.40E+12 | 1.11E+12 |
| | AM-241 | 59.54 | | 35.90 | 1.94E-01 | 1.94E-01 | -1.90E-03 | 9.51E-02 |
| | AM-243 | 74.67 | | 66.00 | 1.34E-01 | 1.34E-01 | 5.03E-01 | 6.61E-02 |
| + | CM-243 | 209.75 | * | 3.29 | 2.70E+00 | 4.94E-01 | 1.73E+00 | 1.32E+00 |
| | | 228.14 | | 10.60 | 5.58E-01 | | -1.62E-01 | 2.69E-01 |
| | | 277.60 | * | 14.00 | 4.94E-01 | | 3.19E-01 | 2.38E-01 |

Analysis Report for 1707087-09

HTC-A03-S002-3036-01

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-3036-01

Elapsed Live time: 3600
Elapsed Real Time: 3602

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 96 |
| 17: | 87 | 82 | 81 | 79 | 61 | 75 | 70 | 92 |
| 25: | 65 | 67 | 46 | 67 | 76 | 66 | 59 | 60 |
| 33: | 61 | 63 | 60 | 71 | 52 | 48 | 64 | 55 |
| 41: | 61 | 67 | 63 | 85 | 91 | 98 | 80 | 51 |
| 49: | 73 | 79 | 89 | 85 | 84 | 92 | 103 | 107 |
| 57: | 106 | 101 | 93 | 111 | 127 | 146 | 133 | 120 |
| 65: | 117 | 103 | 123 | 123 | 139 | 131 | 120 | 138 |
| 73: | 202 | 265 | 257 | 351 | 275 | 140 | 102 | 127 |
| 81: | 91 | 98 | 131 | 131 | 132 | 178 | 156 | 118 |
| 89: | 130 | 130 | 146 | 164 | 159 | 83 | 72 | 88 |
| 97: | 78 | 65 | 66 | 70 | 54 | 63 | 74 | 75 |
| 105: | 85 | 68 | 61 | 67 | 78 | 87 | 77 | 57 |
| 113: | 61 | 81 | 70 | 68 | 77 | 63 | 64 | 71 |
| 121: | 73 | 70 | 74 | 67 | 67 | 77 | 74 | 86 |
| 129: | 76 | 68 | 73 | 62 | 53 | 68 | 64 | 64 |
| 137: | 69 | 60 | 63 | 74 | 51 | 76 | 75 | 75 |
| 145: | 79 | 72 | 67 | 64 | 67 | 63 | 49 | 53 |
| 153: | 55 | 76 | 50 | 54 | 56 | 53 | 56 | 74 |
| 161: | 52 | 59 | 54 | 56 | 43 | 55 | 50 | 45 |
| 169: | 52 | 50 | 49 | 51 | 39 | 49 | 51 | 45 |
| 177: | 45 | 53 | 42 | 56 | 42 | 43 | 52 | 61 |
| 185: | 91 | 90 | 49 | 42 | 41 | 43 | 50 | 51 |
| 193: | 43 | 45 | 54 | 47 | 54 | 47 | 51 | 43 |
| 201: | 41 | 43 | 47 | 46 | 45 | 45 | 67 | 82 |
| 209: | 64 | 54 | 55 | 48 | 48 | 59 | 50 | 44 |
| 217: | 46 | 46 | 44 | 43 | 38 | 33 | 42 | 22 |
| 225: | 42 | 30 | 37 | 39 | 38 | 47 | 40 | 43 |
| 233: | 36 | 44 | 41 | 81 | 204 | 276 | 162 | 80 |
| 241: | 78 | 62 | 23 | 45 | 29 | 35 | 26 | 41 |
| 249: | 27 | 29 | 22 | 33 | 32 | 27 | 33 | 33 |
| 257: | 31 | 25 | 29 | 35 | 26 | 18 | 24 | 30 |
| 265: | 37 | 29 | 21 | 32 | 37 | 48 | 27 | 32 |
| 273: | 27 | 31 | 19 | 46 | 33 | 47 | 34 | 21 |
| 281: | 21 | 28 | 22 | 27 | 36 | 22 | 23 | 28 |
| 289: | 26 | 20 | 22 | 31 | 51 | 71 | 95 | 49 |
| 297: | 20 | 29 | 34 | 32 | 21 | 32 | 19 | 19 |
| 305: | 20 | 20 | 17 | 28 | 24 | 20 | 22 | 17 |
| 313: | 29 | 21 | 24 | 26 | 25 | 23 | 21 | 19 |
| 321: | 19 | 15 | 23 | 29 | 24 | 30 | 29 | 31 |
| 329: | 27 | 25 | 17 | 35 | 24 | 21 | 24 | 30 |
| 337: | 50 | 66 | 32 | 22 | 22 | 20 | 17 | 22 |
| 345: | 27 | 22 | 16 | 18 | 25 | 57 | 119 | 102 |
| 353: | 35 | 22 | 16 | 23 | 16 | 25 | 20 | 30 |
| 361: | 13 | 29 | 16 | 15 | 12 | 24 | 17 | 23 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 24 | 21 | 17 | 11 | 20 | 21 | 21 | 13 |

Sample Title: HTC-A03-S002-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 20 | 20 | 13 | 17 | 20 | 18 | 22 | 27 |
| 385: | 23 | 18 | 32 | 16 | 17 | 18 | 15 | 23 |
| 393: | 9 | 21 | 13 | 15 | 17 | 19 | 12 | 20 |
| 401: | 13 | 26 | 23 | 15 | 21 | 19 | 16 | 23 |
| 409: | 19 | 21 | 16 | 20 | 13 | 9 | 16 | 10 |
| 417: | 15 | 12 | 10 | 12 | 13 | 12 | 10 | 10 |
| 425: | 20 | 12 | 17 | 15 | 17 | 18 | 17 | 22 |
| 433: | 13 | 13 | 20 | 11 | 15 | 13 | 21 | 26 |
| 441: | 10 | 10 | 11 | 17 | 14 | 21 | 16 | 16 |
| 449: | 18 | 13 | 9 | 13 | 4 | 19 | 16 | 7 |
| 457: | 8 | 18 | 11 | 15 | 17 | 29 | 22 | 14 |
| 465: | 11 | 23 | 16 | 17 | 15 | 17 | 11 | 20 |
| 473: | 16 | 14 | 14 | 6 | 12 | 14 | 17 | 16 |
| 481: | 12 | 16 | 13 | 12 | 14 | 11 | 12 | 13 |
| 489: | 8 | 7 | 14 | 13 | 6 | 9 | 14 | 11 |
| 497: | 13 | 13 | 13 | 4 | 12 | 19 | 11 | 14 |
| 505: | 11 | 12 | 16 | 27 | 29 | 49 | 36 | 18 |
| 513: | 15 | 14 | 11 | 9 | 6 | 11 | 12 | 11 |
| 521: | 6 | 9 | 9 | 10 | 15 | 8 | 9 | 9 |
| 529: | 13 | 10 | 8 | 11 | 13 | 7 | 9 | 12 |
| 537: | 13 | 16 | 9 | 11 | 6 | 5 | 5 | 7 |
| 545: | 9 | 17 | 10 | 5 | 15 | 14 | 10 | 8 |
| 553: | 14 | 11 | 6 | 5 | 11 | 9 | 7 | 7 |
| 561: | 13 | 11 | 13 | 10 | 19 | 17 | 15 | 14 |
| 569: | 12 | 6 | 14 | 8 | 10 | 8 | 11 | 8 |
| 577: | 8 | 13 | 17 | 12 | 32 | 64 | 53 | 26 |
| 585: | 9 | 14 | 7 | 14 | 8 | 10 | 2 | 10 |
| 593: | 6 | 8 | 11 | 9 | 9 | 9 | 6 | 10 |
| 601: | 12 | 8 | 11 | 12 | 12 | 11 | 34 | 63 |
| 609: | 82 | 36 | 21 | 7 | 9 | 7 | 11 | 16 |
| 617: | 11 | 11 | 11 | 7 | 5 | 10 | 6 | 12 |
| 625: | 4 | 10 | 8 | 12 | 8 | 5 | 6 | 11 |
| 633: | 6 | 9 | 8 | 8 | 9 | 8 | 2 | 11 |
| 641: | 9 | 6 | 11 | 7 | 5 | 7 | 9 | 8 |
| 649: | 14 | 6 | 10 | 9 | 11 | 5 | 7 | 4 |
| 657: | 7 | 5 | 9 | 29 | 33 | 24 | 8 | 12 |
| 665: | 11 | 6 | 12 | 4 | 12 | 6 | 7 | 14 |
| 673: | 8 | 8 | 11 | 11 | 13 | 6 | 14 | 4 |
| 681: | 10 | 12 | 9 | 8 | 9 | 9 | 11 | 6 |
| 689: | 7 | 3 | 10 | 6 | 8 | 11 | 9 | 2 |
| 697: | 17 | 5 | 7 | 6 | 15 | 13 | 7 | 4 |
| 705: | 6 | 4 | 7 | 8 | 6 | 8 | 10 | 9 |
| 713: | 14 | 2 | 5 | 11 | 16 | 5 | 13 | 11 |
| 721: | 10 | 8 | 7 | 7 | 23 | 14 | 16 | 11 |
| 729: | 4 | 9 | 4 | 13 | 6 | 8 | 5 | 6 |
| 737: | 10 | 9 | 11 | 9 | 13 | 6 | 7 | 7 |
| 745: | 7 | 12 | 0 | 9 | 6 | 12 | 6 | 8 |
| 753: | 7 | 8 | 12 | 12 | 2 | 12 | 4 | 5 |
| 761: | 7 | 5 | 10 | 14 | 10 | 8 | 11 | 11 |
| 769: | 13 | 5 | 14 | 8 | 7 | 7 | 7 | 4 |
| 777: | 10 | 7 | 8 | 7 | 7 | 8 | 9 | 11 |
| 785: | 10 | 10 | 8 | 6 | 5 | 6 | 6 | 11 |
| 793: | 9 | 12 | 7 | 8 | 4 | 8 | 10 | 8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 2 | 6 | 7 | 12 | 8 | 7 | 8 | 4 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 8 | 7 | 7 | 6 | 9 | 11 | 5 | 5 |
| 817: | 6 | 4 | 1 | 9 | 7 | 4 | 6 | 7 |
| 825: | 2 | 5 | 8 | 7 | 5 | 10 | 10 | 5 |
| 833: | 8 | 7 | 10 | 9 | 5 | 9 | 5 | 9 |
| 841: | 8 | 5 | 11 | 11 | 4 | 4 | 4 | 9 |
| 849: | 5 | 4 | 3 | 6 | 4 | 5 | 6 | 6 |
| 857: | 3 | 10 | 10 | 9 | 5 | 9 | 7 | 5 |
| 865: | 6 | 6 | 8 | 4 | 5 | 3 | 9 | 7 |
| 873: | 4 | 4 | 5 | 6 | 3 | 2 | 4 | 5 |
| 881: | 7 | 9 | 4 | 9 | 5 | 9 | 5 | 6 |
| 889: | 6 | 7 | 7 | 8 | 5 | 3 | 8 | 8 |
| 897: | 4 | 6 | 7 | 9 | 2 | 7 | 11 | 11 |
| 905: | 4 | 11 | 2 | 8 | 19 | 42 | 31 | 21 |
| 913: | 2 | 6 | 4 | 7 | 1 | 6 | 3 | 5 |
| 921: | 7 | 5 | 5 | 5 | 8 | 4 | 4 | 3 |
| 929: | 3 | 4 | 7 | 5 | 12 | 6 | 5 | 2 |
| 937: | 4 | 4 | 5 | 4 | 7 | 5 | 6 | 7 |
| 945: | 5 | 2 | 5 | 4 | 6 | 4 | 4 | 9 |
| 953: | 2 | 4 | 4 | 9 | 6 | 4 | 14 | 4 |
| 961: | 8 | 6 | 5 | 17 | 9 | 9 | 17 | 34 |
| 969: | 17 | 14 | 7 | 2 | 1 | 9 | 7 | 5 |
| 977: | 1 | 3 | 2 | 5 | 8 | 7 | 6 | 9 |
| 985: | 7 | 10 | 6 | 7 | 2 | 5 | 3 | 5 |
| 993: | 1 | 8 | 7 | 5 | 3 | 5 | 4 | 7 |
| 1001: | 7 | 3 | 3 | 5 | 5 | 8 | 6 | 3 |
| 1009: | 3 | 7 | 4 | 3 | 5 | 7 | 4 | 4 |
| 1017: | 6 | 4 | 5 | 7 | 4 | 7 | 5 | 2 |
| 1025: | 4 | 2 | 3 | 5 | 7 | 2 | 6 | 2 |
| 1033: | 7 | 7 | 6 | 5 | 7 | 7 | 1 | 7 |
| 1041: | 3 | 2 | 6 | 5 | 4 | 6 | 6 | 4 |
| 1049: | 5 | 4 | 8 | 7 | 6 | 6 | 9 | 3 |
| 1057: | 3 | 5 | 7 | 4 | 6 | 7 | 9 | 6 |
| 1065: | 5 | 6 | 1 | 4 | 13 | 3 | 4 | 3 |
| 1073: | 4 | 7 | 6 | 6 | 5 | 10 | 6 | 7 |
| 1081: | 5 | 6 | 6 | 12 | 4 | 1 | 8 | 7 |
| 1089: | 6 | 6 | 10 | 5 | 6 | 7 | 11 | 4 |
| 1097: | 2 | 8 | 6 | 6 | 2 | 3 | 3 | 4 |
| 1105: | 6 | 5 | 6 | 5 | 2 | 5 | 2 | 4 |
| 1113: | 5 | 5 | 10 | 5 | 5 | 9 | 27 | 20 |
| 1121: | 8 | 8 | 8 | 7 | 2 | 8 | 4 | 3 |
| 1129: | 7 | 5 | 3 | 6 | 5 | 6 | 6 | 3 |
| 1137: | 2 | 9 | 2 | 10 | 4 | 11 | 5 | 5 |
| 1145: | 13 | 9 | 6 | 5 | 7 | 6 | 7 | 11 |
| 1153: | 4 | 8 | 11 | 6 | 4 | 6 | 4 | 7 |
| 1161: | 5 | 8 | 8 | 9 | 8 | 4 | 8 | 9 |
| 1169: | 5 | 9 | 12 | 1 | 11 | 4 | 7 | 6 |
| 1177: | 6 | 4 | 6 | 3 | 8 | 10 | 9 | 9 |
| 1185: | 4 | 4 | 8 | 6 | 5 | 5 | 7 | 0 |
| 1193: | 5 | 8 | 6 | 3 | 3 | 9 | 6 | 5 |
| 1201: | 1 | 7 | 9 | 2 | 7 | 7 | 9 | 6 |
| 1209: | 8 | 5 | 6 | 3 | 8 | 5 | 10 | 7 |
| 1217: | 8 | 9 | 9 | 8 | 8 | 9 | 3 | 1 |
| 1225: | 5 | 5 | 5 | 4 | 6 | 8 | 10 | 10 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 6 | 5 | 7 | 13 | 10 | 12 | 6 | 6 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 11 | 12 | 10 | 7 | 4 | 8 | 9 | 7 |
| 1249: | 1 | 2 | 4 | 6 | 7 | 6 | 3 | 3 |
| 1257: | 3 | 7 | 3 | 5 | 8 | 6 | 5 | 4 |
| 1265: | 6 | 3 | 4 | 7 | 4 | 5 | 3 | 9 |
| 1273: | 6 | 7 | 3 | 7 | 12 | 4 | 6 | 7 |
| 1281: | 5 | 3 | 7 | 5 | 3 | 4 | 2 | 2 |
| 1289: | 4 | 5 | 4 | 6 | 3 | 3 | 2 | 1 |
| 1297: | 5 | 8 | 6 | 2 | 4 | 5 | 9 | 4 |
| 1305: | 9 | 3 | 2 | 6 | 4 | 3 | 6 | 1 |
| 1313: | 6 | 3 | 3 | 7 | 9 | 4 | 4 | 4 |
| 1321: | 4 | 5 | 3 | 3 | 7 | 3 | 1 | 1 |
| 1329: | 1 | 2 | 3 | 3 | 0 | 6 | 2 | 2 |
| 1337: | 5 | 2 | 2 | 1 | 1 | 1 | 5 | 3 |
| 1345: | 4 | 3 | 1 | 1 | 2 | 1 | 2 | 4 |
| 1353: | 3 | 2 | 6 | 2 | 1 | 4 | 1 | 1 |
| 1361: | 2 | 0 | 2 | 1 | 4 | 4 | 3 | 1 |
| 1369: | 1 | 2 | 3 | 3 | 2 | 2 | 5 | 8 |
| 1377: | 4 | 6 | 2 | 2 | 4 | 4 | 2 | 3 |
| 1385: | 4 | 4 | 3 | 2 | 1 | 4 | 1 | 1 |
| 1393: | 1 | 1 | 1 | 1 | 4 | 2 | 3 | 4 |
| 1401: | 1 | 4 | 3 | 6 | 2 | 3 | 5 | 3 |
| 1409: | 4 | 0 | 1 | 0 | 5 | 3 | 2 | 1 |
| 1417: | 0 | 3 | 1 | 2 | 1 | 2 | 2 | 5 |
| 1425: | 1 | 3 | 1 | 3 | 4 | 1 | 4 | 4 |
| 1433: | 2 | 3 | 4 | 2 | 1 | 1 | 3 | 1 |
| 1441: | 3 | 2 | 0 | 1 | 2 | 6 | 2 | 0 |
| 1449: | 1 | 0 | 0 | 4 | 0 | 1 | 1 | 2 |
| 1457: | 7 | 13 | 71 | 138 | 107 | 39 | 10 | 1 |
| 1465: | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 1 |
| 1473: | 0 | 2 | 0 | 0 | 5 | 0 | 0 | 0 |
| 1481: | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 1489: | 2 | 2 | 3 | 2 | 3 | 0 | 2 | 0 |
| 1497: | 2 | 2 | 1 | 4 | 1 | 4 | 0 | 0 |
| 1505: | 3 | 3 | 3 | 5 | 4 | 1 | 1 | 1 |
| 1513: | 3 | 0 | 1 | 0 | 1 | 1 | 1 | 2 |
| 1521: | 3 | 1 | 1 | 1 | 2 | 3 | 1 | 1 |
| 1529: | 2 | 1 | 1 | 0 | 4 | 1 | 2 | 2 |
| 1537: | 0 | 1 | 1 | 4 | 2 | 1 | 4 | 1 |
| 1545: | 2 | 2 | 0 | 1 | 1 | 1 | 2 | 2 |
| 1553: | 2 | 1 | 0 | 2 | 0 | 2 | 0 | 1 |
| 1561: | 0 | 0 | 0 | 2 | 1 | 3 | 0 | 4 |
| 1569: | 3 | 0 | 1 | 3 | 2 | 1 | 0 | 1 |
| 1577: | 3 | 2 | 1 | 2 | 2 | 0 | 2 | 0 |
| 1585: | 1 | 5 | 3 | 5 | 1 | 1 | 7 | 5 |
| 1593: | 6 | 3 | 2 | 1 | 0 | 2 | 0 | 4 |
| 1601: | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 0 |
| 1609: | 0 | 1 | 2 | 2 | 0 | 2 | 3 | 0 |
| 1617: | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 0 |
| 1625: | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 0 |
| 1633: | 0 | 0 | 1 | 0 | 2 | 1 | 3 | 0 |
| 1641: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1649: | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 2 |
| 1657: | 3 | 1 | 0 | 4 | 3 | 3 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 1 | 3 | 1 | 2 | 1 | 0 | 0 | 2 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 1 |
| 1681: | 0 | 1 | 3 | 1 | 0 | 1 | 2 | 2 |
| 1689: | 2 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |
| 1697: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 1705: | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 0 |
| 1713: | 0 | 0 | 1 | 0 | 3 | 2 | 0 | 0 |
| 1721: | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 1 |
| 1729: | 7 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1737: | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 1 |
| 1745: | 3 | 1 | 0 | 2 | 1 | 2 | 1 | 0 |
| 1753: | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 3 |
| 1761: | 0 | 4 | 6 | 5 | 5 | 1 | 1 | 1 |
| 1769: | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 1777: | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 1 |
| 1785: | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 |
| 1793: | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 1 |
| 1801: | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 0 |
| 1809: | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 2 |
| 1817: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 1825: | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 1833: | 5 | 2 | 1 | 2 | 1 | 1 | 0 | 1 |
| 1841: | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 |
| 1849: | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 1857: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 1865: | 4 | 1 | 1 | 1 | 2 | 1 | 0 | 0 |
| 1873: | 1 | 3 | 0 | 0 | 0 | 1 | 0 | 0 |
| 1881: | 0 | 0 | 0 | 2 | 1 | 4 | 1 | 1 |
| 1889: | 0 | 0 | 0 | 3 | 1 | 2 | 3 | 1 |
| 1897: | 3 | 0 | 1 | 2 | 1 | 0 | 1 | 1 |
| 1905: | 1 | 1 | 0 | 1 | 4 | 0 | 2 | 2 |
| 1913: | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 1 |
| 1921: | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1929: | 3 | 1 | 0 | 0 | 1 | 2 | 1 | 0 |
| 1937: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 1945: | 0 | 2 | 1 | 1 | 3 | 1 | 2 | 0 |
| 1953: | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 2 |
| 1961: | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 1 |
| 1969: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1977: | 1 | 3 | 0 | 2 | 0 | 0 | 2 | 2 |
| 1985: | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| 1993: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| 2001: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2009: | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 2 |
| 2017: | 1 | 0 | 1 | 2 | 0 | 0 | 1 | 1 |
| 2025: | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 0 |
| 2033: | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 |
| 2041: | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 |
| 2049: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 2057: | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2065: | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 2073: | 2 | 0 | 0 | 2 | 2 | 0 | 1 | 0 |
| 2081: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2089: | 1 | 0 | 0 | 0 | 3 | 0 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 0 | 0 | 1 | 1 | 2 | 4 | 1 | 3 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| 2113: | 3 | 0 | 0 | 2 | 1 | 2 | 0 | 0 |
| 2121: | 4 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2129: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2137: | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 2145: | 0 | 0 | 2 | 1 | 0 | 0 | 2 | 0 |
| 2153: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2161: | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 0 |
| 2169: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2177: | 0 | 2 | 1 | 0 | 1 | 2 | 0 | 1 |
| 2185: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 |
| 2193: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2201: | 0 | 1 | 2 | 1 | 1 | 2 | 0 | 0 |
| 2209: | 1 | 0 | 3 | 1 | 0 | 1 | 1 | 1 |
| 2217: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2225: | 2 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2233: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2241: | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2249: | 0 | 3 | 1 | 1 | 1 | 1 | 0 | 0 |
| 2257: | 2 | 2 | 1 | 2 | 0 | 0 | 1 | 0 |
| 2265: | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 0 |
| 2273: | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 1 |
| 2281: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2289: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2297: | 1 | 1 | 0 | 1 | 3 | 1 | 2 | 0 |
| 2305: | 1 | 0 | 2 | 0 | 1 | 0 | 1 | 0 |
| 2313: | 1 | 1 | 0 | 2 | 2 | 1 | 1 | 0 |
| 2321: | 0 | 0 | 2 | 0 | 2 | 2 | 0 | 0 |
| 2329: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2337: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2345: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 2353: | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 2 |
| 2361: | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 |
| 2369: | 2 | 2 | 0 | 0 | 1 | 1 | 1 | 1 |
| 2377: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 2385: | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 1 |
| 2393: | 1 | 0 | 0 | 1 | 0 | 2 | 2 | 0 |
| 2401: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2409: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2417: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| 2425: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 2433: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2441: | 3 | 0 | 0 | 2 | 0 | 0 | 1 | 1 |
| 2449: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 |
| 2457: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 2465: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2473: | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| 2481: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2489: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 2497: | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 0 |
| 2505: | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 0 |
| 2513: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 2521: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2545: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| 2553: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 2561: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2569: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2585: | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 2593: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2601: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2609: | 1 | 0 | 2 | 5 | 12 | 10 | 13 | 4 |
| 2617: | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2625: | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2633: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2641: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2689: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2697: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2705: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2713: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2721: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2737: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2745: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2761: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2769: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 2777: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2793: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2801: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2809: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2817: | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| 2825: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2841: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2865: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2873: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2881: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2889: | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 |
| 2897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2905: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2913: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2921: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2929: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2945: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 2977: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3017: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3041: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3089: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3113: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3121: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3153: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 3177: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3185: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3193: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3201: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3233: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| 3241: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3249: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3257: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3281: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3329: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |

Sample Title: HTC-A03-S002-3036-01

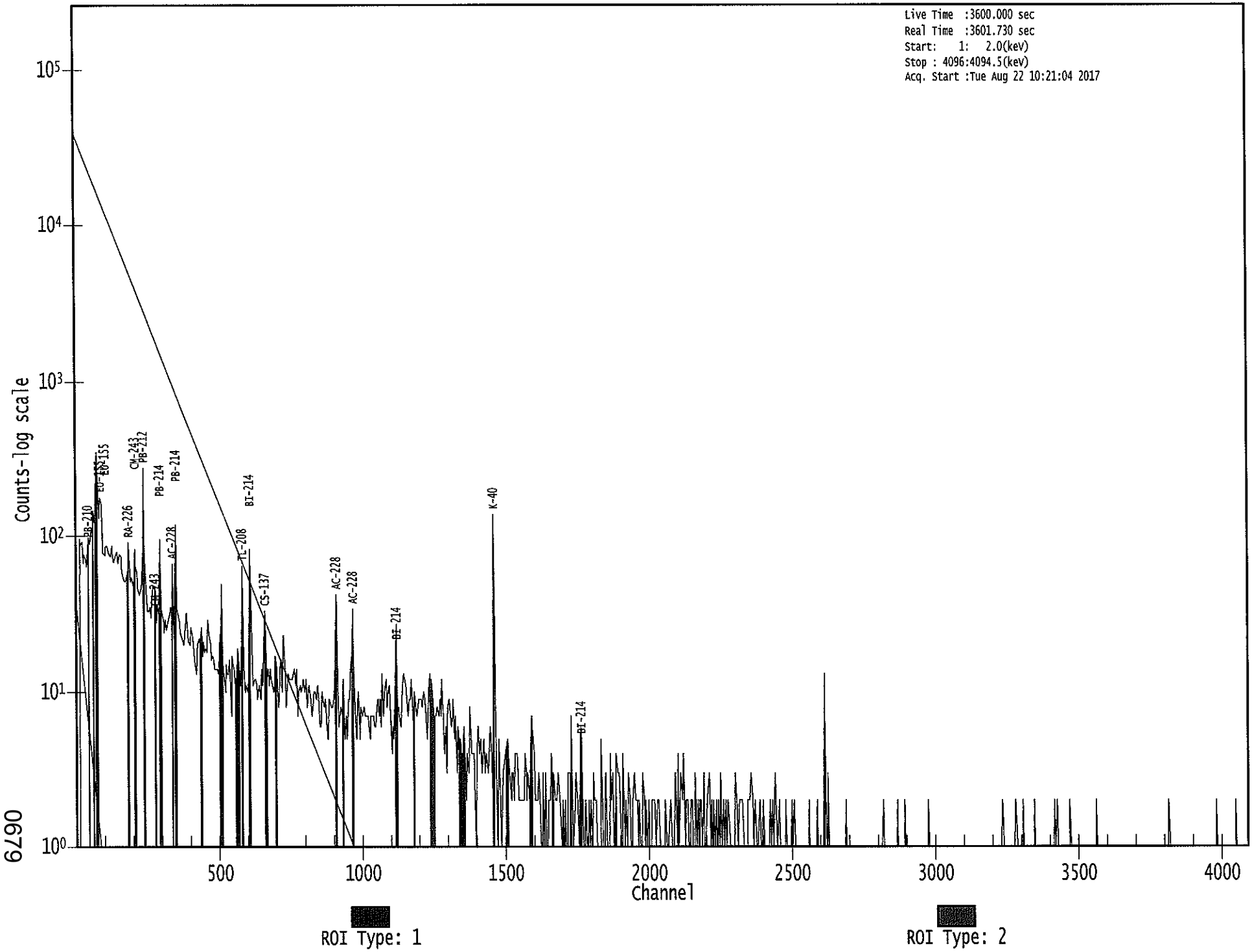
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3417: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3425: | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3449: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3481: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3513: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3617: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3689: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3737: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3769: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3785: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3801: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3817: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3841: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3953: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 4033: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |

# 0000055711.CNF




0679

KB 8/22/17

Apex-Gamma

Analysis Report for 1707087-12
HTC-A03-S002-3036-02

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-12 |
| Sample Description | : HTC-A03-S002-3036-02 |
| Sample Type | : SOIL |
| Sample Size | : 6.826E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:44:26AM |
| Acquisition Started | : 8/22/2017 11:06:13AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE1 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.4 seconds |
| Dead Time | : 0.04 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 18 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55713 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG 8/23/17

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 12:06:18PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 62.46 | 63.07 | 0.0000 | 0.00 |
| 2 | 74.72 | 75.31 | 0.0000 | 0.00 |
| 3 | 77.23 | 77.82 | 0.0000 | 0.00 |
| 4 | 86.70 | 87.28 | 0.0000 | 0.00 |
| 5 | 92.72 | 93.30 | 0.0000 | 0.00 |
| 6 | 127.89 | 128.43 | 0.0000 | 0.00 |
| 7 | 185.81 | 186.29 | 0.0000 | 0.00 |
| 8 | 208.53 | 208.99 | 0.0000 | 0.00 |
| 9 | 230.10 | 230.54 | 0.0000 | 0.00 |
| 10 | 238.62 | 239.04 | 0.0000 | 0.00 |
| 11 | 241.67 | 242.09 | 0.0000 | 0.00 |
| 12 | 270.73 | 271.12 | 0.0000 | 0.00 |
| 13 | 295.28 | 295.64 | 0.0000 | 0.00 |
| 14 | 300.28 | 300.64 | 0.0000 | 0.00 |
| 15 | 327.92 | 328.26 | 0.0000 | 0.00 |
| 16 | 339.27 | 339.59 | 0.0000 | 0.00 |
| 17 | 351.79 | 352.10 | 0.0000 | 0.00 |
| 18 | 389.29 | 389.56 | 0.0000 | 0.00 |
| 19 | 461.82 | 462.02 | 0.0000 | 0.00 |
| 20 | 491.11 | 491.28 | 0.0000 | 0.00 |
| 21 | 511.13 | 511.28 | 0.0000 | 0.00 |
| 22 | 561.56 | 561.66 | 0.0000 | 0.00 |
| 23 | 583.61 | 583.69 | 0.0000 | 0.00 |
| 24 | 609.42 | 609.47 | 0.0000 | 0.00 |
| 25 | 661.48 | 661.48 | 0.0000 | 0.00 |
| 26 | 713.05 | 713.00 | 0.0000 | 0.00 |
| 27 | 727.29 | 727.23 | 0.0000 | 0.00 |
| 28 | 769.68 | 769.57 | 0.0000 | 0.00 |
| 29 | 794.73 | 794.59 | 0.0000 | 0.00 |
| 30 | 861.00 | 860.80 | 0.0000 | 0.00 |
| 31 | 864.40 | 864.20 | 0.0000 | 0.00 |
| 32 | 911.57 | 911.32 | 0.0000 | 0.00 |
| 33 | 924.04 | 923.78 | 0.0000 | 0.00 |
| 34 | 934.88 | 934.60 | 0.0000 | 0.00 |
| 35 | 955.15 | 954.85 | 0.0000 | 0.00 |
| 36 | 964.65 | 964.35 | 0.0000 | 0.00 |
| 37 | 969.46 | 969.15 | 0.0000 | 0.00 |
| 38 | 1121.07 | 1120.61 | 0.0000 | 0.00 |
| 39 | 1238.24 | 1237.66 | 0.0000 | 0.00 |
| 40 | 1378.14 | 1377.43 | 0.0000 | 0.00 |
| 41 | 1402.72 | 1401.98 | 0.0000 | 0.00 |
| 42 | 1409.46 | 1408.72 | 0.0000 | 0.00 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1415.75 | 1415.00 | 0.0000 | 0.00 |
| 44 | 1461.34 | 1460.54 | 0.0000 | 0.00 |
| 45 | 1465.34 | 1464.54 | 0.0000 | 0.00 |
| 46 | 1539.80 | 1538.92 | 0.0000 | 0.00 |
| 47 | 1581.34 | 1580.43 | 0.0000 | 0.00 |
| 48 | 1588.05 | 1587.13 | 0.0000 | 0.00 |
| 49 | 1593.21 | 1592.28 | 0.0000 | 0.00 |
| 50 | 1622.05 | 1621.09 | 0.0000 | 0.00 |
| 51 | 1659.77 | 1658.78 | 0.0000 | 0.00 |
| 52 | 1662.99 | 1662.00 | 0.0000 | 0.00 |
| 53 | 1765.12 | 1764.03 | 0.0000 | 0.00 |
| 54 | 1840.31 | 1839.15 | 0.0000 | 0.00 |
| 55 | 1848.20 | 1847.03 | 0.0000 | 0.00 |
| 56 | 1957.58 | 1956.30 | 0.0000 | 0.00 |
| 57 | 2119.72 | 2118.28 | 0.0000 | 0.00 |
| 58 | 2204.85 | 2203.33 | 0.0000 | 0.00 |
| 59 | 2405.53 | 2403.82 | 0.0000 | 0.00 |
| 60 | 2449.08 | 2447.33 | 0.0000 | 0.00 |
| 61 | 2615.30 | 2613.39 | 0.0000 | 0.00 |
| 62 | 3114.18 | 3111.80 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 12:06:18PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 62.46 | 58 - | 67 | 63.07 | 2.79E+02 | 134.61 | 2.44E+03 | 1.41 |
| M | 2 | 74.72 | 71 - | 83 | 75.31 | 4.08E+02 | 94.78 | 1.39E+03 | 1.81 |
| m | 3 | 77.23 | 71 - | 83 | 77.82 | 5.81E+02 | 100.31 | 1.35E+03 | 1.82 |
| M | 4 | 86.70 | 83 - | 97 | 87.28 | 4.51E+02 | 107.48 | 1.67E+03 | 3.92 |
| m | 5 | 92.72 | 83 - | 97 | 93.30 | 5.34E+02 | 109.16 | 1.48E+03 | 2.80 |
| | 6 | 127.89 | 123 - | 133 | 128.43 | 1.46E+02 | 114.36 | 1.66E+03 | 2.84 |
| | 7 | 185.81 | 183 - | 190 | 186.29 | 1.72E+02 | 84.85 | 1.07E+03 | 1.79 |
| | 8 | 208.53 | 205 - | 212 | 208.99 | 1.50E+02 | 73.84 | 8.02E+02 | 2.13 |
| M | 9 | 230.10 | 229 - | 245 | 230.54 | 5.22E+01 | 38.63 | 3.50E+02 | 1.92 |
| m | 10 | 238.62 | 229 - | 245 | 239.04 | 9.36E+02 | 80.69 | 5.01E+02 | 1.85 |
| m | 11 | 241.67 | 229 - | 245 | 242.09 | 2.11E+02 | 83.94 | 5.61E+02 | 2.21 |
| | 12 | 270.73 | 267 - | 275 | 271.12 | 1.57E+02 | 64.55 | 5.43E+02 | 3.06 |
| M | 13 | 295.28 | 292 - | 303 | 295.64 | 3.33E+02 | 54.71 | 3.30E+02 | 2.05 |
| m | 14 | 300.28 | 292 - | 303 | 300.64 | 8.73E+01 | 44.73 | 3.11E+02 | 2.06 |
| | 15 | 327.92 | 325 - | 331 | 328.26 | 6.22E+01 | 48.95 | 3.88E+02 | 1.86 |
| | 16 | 339.27 | 335 - | 344 | 339.59 | 1.77E+02 | 66.01 | 5.12E+02 | 1.83 |
| | 17 | 351.79 | 347 - | 356 | 352.10 | 4.57E+02 | 76.06 | 5.65E+02 | 1.51 |
| | 18 | 389.29 | 386 - | 395 | 389.56 | 6.18E+01 | 51.87 | 3.46E+02 | 2.34 |
| | 19 | 461.82 | 457 - | 468 | 462.02 | 7.48E+01 | 59.73 | 4.10E+02 | 2.31 |
| | 20 | 491.11 | 489 - | 494 | 491.28 | 2.47E+01 | 29.00 | 1.51E+02 | 1.25 |
| | 21 | 511.13 | 506 - | 516 | 511.28 | 2.09E+02 | 57.54 | 3.29E+02 | 2.13 |
| | 22 | 561.56 | 558 - | 565 | 561.66 | 3.05E+01 | 36.99 | 2.07E+02 | 2.30 |
| | 23 | 583.61 | 579 - | 589 | 583.69 | 3.16E+02 | 60.22 | 3.04E+02 | 2.06 |
| | 24 | 609.42 | 604 - | 614 | 609.47 | 3.52E+02 | 60.59 | 3.00E+02 | 2.11 |
| | 25 | 661.48 | 657 - | 664 | 661.48 | 9.60E+01 | 42.99 | 2.44E+02 | 1.40 |
| | 26 | 713.05 | 710 - | 716 | 713.00 | 2.96E+01 | 25.99 | 1.01E+02 | 4.74 |
| | 27 | 727.29 | 723 - | 731 | 727.23 | 5.00E+01 | 38.14 | 1.92E+02 | 1.98 |
| | 28 | 769.68 | 764 - | 776 | 769.57 | 5.40E+01 | 44.59 | 2.10E+02 | 4.65 |
| | 29 | 794.73 | 791 - | 798 | 794.59 | 3.99E+01 | 28.07 | 1.06E+02 | 1.32 |
| M | 30 | 861.00 | 856 - | 866 | 860.80 | 4.18E+01 | 29.80 | 1.12E+02 | 2.18 |
| m | 31 | 864.40 | 856 - | 866 | 864.20 | 2.22E+01 | 25.00 | 8.44E+01 | 1.91 |
| | 32 | 911.57 | 905 - | 916 | 911.32 | 1.81E+02 | 51.38 | 2.38E+02 | 2.03 |
| M | 33 | 924.04 | 919 - | 945 | 923.78 | 2.44E+01 | 24.58 | 8.33E+01 | 2.67 |
| m | 34 | 934.88 | 919 - | 945 | 934.60 | 4.63E+01 | 25.61 | 7.29E+01 | 2.67 |
| | 35 | 955.15 | 953 - | 957 | 954.85 | 1.90E+01 | 16.95 | 4.00E+01 | 2.92 |
| M | 36 | 964.65 | 958 - | 972 | 964.35 | 7.28E+01 | 29.63 | 4.52E+01 | 3.25 |
| m | 37 | 969.46 | 958 - | 972 | 969.15 | 1.37E+02 | 31.11 | 4.31E+01 | 2.52 |
| | 38 | 1121.07 | 1115 - | 1126 | 1120.61 | 1.02E+02 | 42.43 | 1.74E+02 | 2.07 |
| | 39 | 1238.24 | 1232 - | 1241 | 1237.66 | 5.60E+01 | 32.62 | 1.20E+02 | 2.82 |
| | 40 | 1378.14 | 1375 - | 1381 | 1377.43 | 1.84E+01 | 15.82 | 3.32E+01 | 2.15 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| M | 41 | 1402.72 | 1397 - | 1424 | 1401.98 | 1.36E+01 | 15.42 | 3.44E+01 | 2.89 |
| m | 42 | 1409.46 | 1397 - | 1424 | 1408.72 | 2.28E+01 | 16.67 | 3.23E+01 | 2.89 |
| m | 43 | 1415.75 | 1397 - | 1424 | 1415.00 | 1.23E+01 | 14.06 | 2.29E+01 | 2.17 |
| M | 44 | 1461.34 | 1454 - | 1469 | 1460.54 | 9.95E+02 | 64.79 | 3.16E+01 | 2.31 |
| m | 45 | 1465.34 | 1454 - | 1469 | 1464.54 | 3.17E+01 | 49.68 | 3.23E+01 | 2.65 |
| | 46 | 1539.80 | 1533 - | 1544 | 1538.92 | 1.77E+01 | 16.12 | 2.26E+01 | 3.11 |
| | 47 | 1581.34 | 1578 - | 1582 | 1580.43 | 5.75E+00 | 6.67 | 4.50E+00 | 1.84 |
| | 48 | 1588.05 | 1584 - | 1590 | 1587.13 | 1.65E+01 | 14.90 | 2.91E+01 | 2.60 |
| | 49 | 1593.21 | 1590 - | 1595 | 1592.28 | 1.18E+01 | 12.29 | 2.04E+01 | 2.63 |
| | 50 | 1622.05 | 1618 - | 1625 | 1621.09 | 1.31E+01 | 12.00 | 1.38E+01 | 3.31 |
| M | 51 | 1659.77 | 1657 - | 1665 | 1658.78 | 8.09E+00 | 5.34 | 8.42E-01 | 2.32 |
| m | 52 | 1662.99 | 1657 - | 1665 | 1662.00 | 9.82E+00 | 9.62 | 1.00E+01 | 2.25 |
| | 53 | 1765.12 | 1759 - | 1768 | 1764.03 | 7.27E+01 | 19.87 | 1.45E+01 | 2.11 |
| | 54 | 1840.31 | 1835 - | 1842 | 1839.15 | 7.00E+00 | 7.21 | 4.00E+00 | 2.78 |
| | 55 | 1848.20 | 1844 - | 1851 | 1847.03 | 1.26E+01 | 8.72 | 4.80E+00 | 1.93 |
| | 56 | 1957.58 | 1952 - | 1960 | 1956.30 | 7.75E+00 | 7.76 | 4.50E+00 | 2.65 |
| | 57 | 2119.72 | 2116 - | 2120 | 2118.28 | 5.00E+00 | 7.40 | 8.00E+00 | 1.11 |
| | 58 | 2204.85 | 2198 - | 2206 | 2203.33 | 2.47E+01 | 13.74 | 1.45E+01 | 3.04 |
| | 59 | 2405.53 | 2400 - | 2406 | 2403.82 | 6.44E+00 | 6.65 | 3.13E+00 | 2.71 |
| | 60 | 2449.08 | 2444 - | 2449 | 2447.33 | 6.00E+00 | 4.90 | 0.00E+00 | 1.92 |
| | 61 | 2615.30 | 2609 - | 2617 | 2613.39 | 9.47E+01 | 20.21 | 4.59E+00 | 2.74 |
| | 62 | 3114.18 | 3108 - | 3114 | 3111.80 | 5.00E+00 | 4.47 | 0.00E+00 | 2.41 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 12:06:18PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 62.46 | 58 - | 67 | 2.79E+02 | 134.61 | 2.44E+03 | 1.07E+02 |
| M | 2 | 74.72 | 71 - | 83 | 4.08E+02 | 94.78 | 1.39E+03 | 6.13E+01 |
| m | 3 | 77.23 | 71 - | 83 | 5.81E+02 | 100.31 | 1.35E+03 | 6.04E+01 |
| M | 4 | 86.70 | 83 - | 97 | 4.51E+02 | 107.48 | 1.67E+03 | 6.72E+01 |
| m | 5 | 92.72 | 83 - | 97 | 5.34E+02 | 109.16 | 1.48E+03 | 6.32E+01 |
| | 6 | 127.89 | 123 - | 133 | 1.46E+02 | 114.36 | 1.66E+03 | 9.19E+01 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 7 | 185.81 | 183 - | 190 | 1.72E+02 | 84.85 | 1.07E+03 | 6.63E+01 |
| | 8 | 208.53 | 205 - | 212 | 1.50E+02 | 73.84 | 8.02E+02 | 2.94E+01 |
| M | 9 | 230.10 | 229 - | 245 | 5.22E+01 | 38.63 | 3.50E+02 | 3.07E+01 |
| m | 10 | 238.62 | 229 - | 245 | 9.36E+02 | 80.69 | 5.01E+02 | 3.68E+01 |
| m | 11 | 241.67 | 229 - | 245 | 2.11E+02 | 83.94 | 5.61E+02 | 3.90E+01 |
| | 12 | 270.73 | 267 - | 275 | 1.57E+02 | 64.55 | 5.43E+02 | 4.89E+01 |
| M | 13 | 295.28 | 292 - | 303 | 3.33E+02 | 54.71 | 3.30E+02 | 2.99E+01 |
| m | 14 | 300.28 | 292 - | 303 | 8.73E+01 | 44.73 | 3.11E+02 | 2.90E+01 |
| | 15 | 327.92 | 325 - | 331 | 6.22E+01 | 48.95 | 3.88E+02 | 3.81E+01 |
| | 16 | 339.27 | 335 - | 344 | 1.77E+02 | 66.01 | 5.12E+02 | 4.97E+01 |
| | 17 | 351.79 | 347 - | 356 | 4.57E+02 | 76.06 | 5.65E+02 | 5.17E+01 |
| | 18 | 389.29 | 386 - | 395 | 6.18E+01 | 51.87 | 3.46E+02 | 4.06E+01 |
| | 19 | 461.82 | 457 - | 468 | 7.48E+01 | 59.73 | 4.10E+02 | 4.70E+01 |
| | 20 | 491.11 | 489 - | 494 | 2.47E+01 | 29.00 | 1.51E+02 | 2.24E+01 |
| | 21 | 511.13 | 506 - | 516 | 2.09E+02 | 57.54 | 3.29E+02 | 4.09E+01 |
| | 22 | 561.56 | 558 - | 565 | 3.05E+01 | 36.99 | 2.07E+02 | 2.90E+01 |
| | 23 | 583.61 | 579 - | 589 | 3.16E+02 | 60.22 | 3.04E+02 | 4.00E+01 |
| | 24 | 609.42 | 604 - | 614 | 3.52E+02 | 60.59 | 3.00E+02 | 3.91E+01 |
| | 25 | 661.48 | 657 - | 664 | 9.60E+01 | 42.99 | 2.44E+02 | 3.15E+01 |
| | 26 | 713.05 | 710 - | 716 | 2.96E+01 | 25.99 | 1.01E+02 | 1.94E+01 |
| | 27 | 727.29 | 723 - | 731 | 5.00E+01 | 38.14 | 1.92E+02 | 2.91E+01 |
| | 28 | 769.68 | 764 - | 776 | 5.40E+01 | 44.59 | 2.10E+02 | 3.46E+01 |
| | 29 | 794.73 | 791 - | 798 | 3.99E+01 | 28.07 | 1.06E+02 | 2.06E+01 |
| M | 30 | 861.00 | 856 - | 866 | 4.18E+01 | 29.80 | 1.12E+02 | 1.74E+01 |
| m | 31 | 864.40 | 856 - | 866 | 2.22E+01 | 25.00 | 8.44E+01 | 1.51E+01 |
| | 32 | 911.57 | 905 - | 916 | 1.81E+02 | 51.38 | 2.38E+02 | 3.60E+01 |
| M | 33 | 924.04 | 919 - | 945 | 2.44E+01 | 24.58 | 8.33E+01 | 1.50E+01 |
| m | 34 | 934.88 | 919 - | 945 | 4.63E+01 | 25.61 | 7.29E+01 | 1.40E+01 |
| | 35 | 955.15 | 953 - | 957 | 1.90E+01 | 16.95 | 4.00E+01 | 1.19E+01 |
| M | 36 | 964.65 | 958 - | 972 | 7.28E+01 | 29.63 | 4.52E+01 | 1.10E+01 |
| m | 37 | 969.46 | 958 - | 972 | 1.37E+02 | 31.11 | 4.31E+01 | 1.08E+01 |
| | 38 | 1121.07 | 1115 - | 1126 | 1.02E+02 | 42.43 | 1.74E+02 | 3.07E+01 |
| | 39 | 1238.24 | 1232 - | 1241 | 5.60E+01 | 32.62 | 1.20E+02 | 2.38E+01 |
| | 40 | 1378.14 | 1375 - | 1381 | 1.84E+01 | 15.82 | 3.32E+01 | 1.09E+01 |
| M | 41 | 1402.72 | 1397 - | 1424 | 1.36E+01 | 15.42 | 3.44E+01 | 9.64E+00 |
| m | 42 | 1409.46 | 1397 - | 1424 | 2.28E+01 | 16.67 | 3.23E+01 | 9.35E+00 |
| m | 43 | 1415.75 | 1397 - | 1424 | 1.23E+01 | 14.06 | 2.29E+01 | 7.87E+00 |
| M | 44 | 1461.34 | 1454 - | 1469 | 9.95E+02 | 64.79 | 3.16E+01 | 9.25E+00 |
| m | 45 | 1465.34 | 1454 - | 1469 | 3.17E+01 | 49.68 | 3.23E+01 | 9.35E+00 |
| | 46 | 1539.80 | 1533 - | 1544 | 1.77E+01 | 16.12 | 2.26E+01 | 1.13E+01 |
| | 47 | 1581.34 | 1578 - | 1582 | 5.75E+00 | 6.67 | 4.50E+00 | 3.81E+00 |
| | 48 | 1588.05 | 1584 - | 1590 | 1.65E+01 | 14.90 | 2.91E+01 | 1.03E+01 |
| | 49 | 1593.21 | 1590 - | 1595 | 1.18E+01 | 12.29 | 2.04E+01 | 8.37E+00 |
| | 50 | 1622.05 | 1618 - | 1625 | 1.31E+01 | 12.00 | 1.38E+01 | 7.87E+00 |
| M | 51 | 1659.77 | 1657 - | 1665 | 8.09E+00 | 5.34 | 8.42E-01 | 1.51E+00 |
| m | 52 | 1662.99 | 1657 - | 1665 | 9.82E+00 | 9.62 | 1.00E+01 | 5.20E+00 |
| | 53 | 1765.12 | 1759 - | 1768 | 7.27E+01 | 19.87 | 1.45E+01 | 8.39E+00 |
| | 54 | 1840.31 | 1835 - | 1842 | 7.00E+00 | 7.21 | 4.00E+00 | 4.03E+00 |
| | 55 | 1848.20 | 1844 - | 1851 | 1.26E+01 | 8.72 | 4.80E+00 | 4.16E+00 |
| | 56 | 1957.58 | 1952 - | 1960 | 7.75E+00 | 7.76 | 4.50E+00 | 4.45E+00 |
| | 57 | 2119.72 | 2116 - | 2120 | 5.00E+00 | 7.40 | 8.00E+00 | 4.85E+00 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 58 | 2204.85 | 2198 - | 2206 | 2.47E+01 | 13.74 | 1.45E+01 | 7.79E+00 |
| 59 | 2405.53 | 2400 - | 2406 | 6.44E+00 | 6.65 | 3.13E+00 | 3.54E+00 |
| 60 | 2449.08 | 2444 - | 2449 | 6.00E+00 | 4.90 | 0.00E+00 | 0.00E+00 |
| 61 | 2615.30 | 2609 - | 2617 | 9.47E+01 | 20.21 | 4.59E+00 | 4.46E+00 |
| 62 | 3114.18 | 3108 - | 3114 | 5.00E+00 | 4.47 | 0.00E+00 | 0.00E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 12:06:18PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 62.46 | 58 - | 67 | 63.07 | 2.79E+02 | 134.61 | 2.44E+03 | TH-230 |
| | | | | | | | | | TH-234 |
| M | 2 | 74.72 | 71 - | 83 | 75.31 | 4.08E+02 | 94.78 | 1.39E+03 | AM-243 |
| m | 3 | 77.23 | 71 - | 83 | 77.82 | 5.81E+02 | 100.31 | 1.35E+03 | ..... |
| M | 4 | 86.70 | 83 - | 97 | 87.28 | 4.51E+02 | 107.48 | 1.67E+03 | NP-237 |
| | | | | | | | | | EU-155 |
| | | | | | | | | | SN-126 |
| m | 5 | 92.72 | 83 - | 97 | 93.30 | 5.34E+02 | 109.16 | 1.48E+03 | GA-67 |
| | 6 | 127.89 | 123 - | 133 | 128.43 | 1.46E+02 | 114.36 | 1.66E+03 | ..... |
| | 7 | 185.81 | 183 - | 190 | 186.29 | 1.72E+02 | 84.85 | 1.07E+03 | RA-226 |
| | 8 | 208.53 | 205 - | 212 | 208.99 | 1.50E+02 | 73.84 | 8.02E+02 | GA-67 |
| M | 9 | 230.10 | 229 - | 245 | 230.54 | 5.22E+01 | 38.63 | 3.50E+02 | ..... |
| m | 10 | 238.62 | 229 - | 245 | 239.04 | 9.36E+02 | 80.69 | 5.01E+02 | PB-212 |
| m | 11 | 241.67 | 229 - | 245 | 242.09 | 2.11E+02 | 83.94 | 5.61E+02 | RA-224 |
| | 12 | 270.73 | 267 - | 275 | 271.12 | 1.57E+02 | 64.55 | 5.43E+02 | ..... |
| M | 13 | 295.28 | 292 - | 303 | 295.64 | 3.33E+02 | 54.71 | 3.30E+02 | PB-214 |
| m | 14 | 300.28 | 292 - | 303 | 300.64 | 8.73E+01 | 44.73 | 3.11E+02 | GA-67 |
| | | | | | | | | | PB-212 |
| | | | | | | | | | BI-210M |
| | 15 | 327.92 | 325 - | 331 | 328.26 | 6.22E+01 | 48.95 | 3.88E+02 | LA-140 |
| | 16 | 339.27 | 335 - | 344 | 339.59 | 1.77E+02 | 66.01 | 5.12E+02 | AC-228 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 17 | 351.79 | 347 - | 356 | 352.10 | 4.57E+02 | 76.06 | 5.65E+02 | PB-214 |
| | 18 | 389.29 | 386 - | 395 | 389.56 | 6.18E+01 | 51.87 | 3.46E+02 | ..... |
| | 19 | 461.82 | 457 - | 468 | 462.02 | 7.48E+01 | 59.73 | 4.10E+02 | ..... |
| | 20 | 491.11 | 489 - | 494 | 491.28 | 2.47E+01 | 29.00 | 1.51E+02 | ..... |
| | 21 | 511.13 | 506 - | 516 | 511.28 | 2.09E+02 | 57.54 | 3.29E+02 | ..... |
| | 22 | 561.56 | 558 - | 565 | 561.66 | 3.05E+01 | 36.99 | 2.07E+02 | ..... |
| | 23 | 583.61 | 579 - | 589 | 583.69 | 3.16E+02 | 60.22 | 3.04E+02 | TL-208 |
| | 24 | 609.42 | 604 - | 614 | 609.47 | 3.52E+02 | 60.59 | 3.00E+02 | BI-214 |
| | 25 | 661.48 | 657 - | 664 | 661.48 | 9.60E+01 | 42.99 | 2.44E+02 | CS-137 |
| | 26 | 713.05 | 710 - | 716 | 713.00 | 2.96E+01 | 25.99 | 1.01E+02 | ..... |
| | 27 | 727.29 | 723 - | 731 | 727.23 | 5.00E+01 | 38.14 | 1.92E+02 | BI-212 |
| | 28 | 769.68 | 764 - | 776 | 769.57 | 5.40E+01 | 44.59 | 2.10E+02 | ..... |
| | 29 | 794.73 | 791 - | 798 | 794.59 | 3.99E+01 | 28.07 | 1.06E+02 | ..... |
| M | 30 | 861.00 | 856 - | 866 | 860.80 | 4.18E+01 | 29.80 | 1.12E+02 | TL-208 |
| m | 31 | 864.40 | 856 - | 866 | 864.20 | 2.22E+01 | 25.00 | 8.44E+01 | ..... |
| | 32 | 911.57 | 905 - | 916 | 911.32 | 1.81E+02 | 51.38 | 2.38E+02 | TL-204<br>AC-228 |
| M | 33 | 924.04 | 919 - | 945 | 923.78 | 2.44E+01 | 24.58 | 8.33E+01 | ..... |
| m | 34 | 934.88 | 919 - | 945 | 934.60 | 4.63E+01 | 25.61 | 7.29E+01 | ..... |
| | 35 | 955.15 | 953 - | 957 | 954.85 | 1.90E+01 | 16.95 | 4.00E+01 | ..... |
| M | 36 | 964.65 | 958 - | 972 | 964.35 | 7.28E+01 | 29.63 | 4.52E+01 | EU-152 |
| m | 37 | 969.46 | 958 - | 972 | 969.15 | 1.37E+02 | 31.11 | 4.31E+01 | AC-228 |
| | 38 | 1121.07 | 1115 - | 1126 | 1120.61 | 1.02E+02 | 42.43 | 1.74E+02 | TA-182<br>SC-46<br>BI-214 |
| | 39 | 1238.24 | 1232 - | 1241 | 1237.66 | 5.60E+01 | 32.62 | 1.20E+02 | CO-56 |
| | 40 | 1378.14 | 1375 - | 1381 | 1377.43 | 1.84E+01 | 15.82 | 3.32E+01 | ..... |
| M | 41 | 1402.72 | 1397 - | 1424 | 1401.98 | 1.36E+01 | 15.42 | 3.44E+01 | ..... |
| m | 42 | 1409.46 | 1397 - | 1424 | 1408.72 | 2.28E+01 | 16.67 | 3.23E+01 | ..... |
| m | 43 | 1415.75 | 1397 - | 1424 | 1415.00 | 1.23E+01 | 14.06 | 2.29E+01 | ..... |
| M | 44 | 1461.34 | 1454 - | 1469 | 1460.54 | 9.95E+02 | 64.79 | 3.16E+01 | K-40 |
| m | 45 | 1465.34 | 1454 - | 1469 | 1464.54 | 3.17E+01 | 49.68 | 3.23E+01 | ..... |
| | 46 | 1539.80 | 1533 - | 1544 | 1538.92 | 1.77E+01 | 16.12 | 2.26E+01 | ..... |
| | 47 | 1581.34 | 1578 - | 1582 | 1580.43 | 5.75E+00 | 6.67 | 4.50E+00 | ..... |
| | 48 | 1588.05 | 1584 - | 1590 | 1587.13 | 1.65E+01 | 14.90 | 2.91E+01 | ..... |
| | 49 | 1593.21 | 1590 - | 1595 | 1592.28 | 1.18E+01 | 12.29 | 2.04E+01 | ..... |
| | 50 | 1622.05 | 1618 - | 1625 | 1621.09 | 1.31E+01 | 12.00 | 1.38E+01 | ..... |
| M | 51 | 1659.77 | 1657 - | 1665 | 1658.78 | 8.09E+00 | 5.34 | 8.42E-01 | ..... |
| m | 52 | 1662.99 | 1657 - | 1665 | 1662.00 | 9.82E+00 | 9.62 | 1.00E+01 | ..... |
| | 53 | 1765.12 | 1759 - | 1768 | 1764.03 | 7.27E+01 | 19.87 | 1.45E+01 | BI-214 |
| | 54 | 1840.31 | 1835 - | 1842 | 1839.15 | 7.00E+00 | 7.21 | 4.00E+00 | ..... |
| | 55 | 1848.20 | 1844 - | 1851 | 1847.03 | 1.26E+01 | 8.72 | 4.80E+00 | ..... |
| | 56 | 1957.58 | 1952 - | 1960 | 1956.30 | 7.75E+00 | 7.76 | 4.50E+00 | ..... |
| | 57 | 2119.72 | 2116 - | 2120 | 2118.28 | 5.00E+00 | 7.40 | 8.00E+00 | ..... |
| | 58 | 2204.85 | 2198 - | 2206 | 2203.33 | 2.47E+01 | 13.74 | 1.45E+01 | BI-214 |
| | 59 | 2405.53 | 2400 - | 2406 | 2403.82 | 6.44E+00 | 6.65 | 3.13E+00 | ..... |
| | 60 | 2449.08 | 2444 - | 2449 | 2447.33 | 6.00E+00 | 4.90 | 0.00E+00 | ..... |
| | 61 | 2615.30 | 2609 - | 2617 | 2613.39 | 9.47E+01 | 20.21 | 4.59E+00 | TL-208 |
| | 62 | 3114.18 | 3108 - | 3114 | 3111.80 | 5.00E+00 | 4.47 | 0.00E+00 | ..... |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 12:06:18PM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 62.46 | 2.79E+02 | 134.61 | 2.69E-02 | 2.25E-03 |
| M | 2 | 74.72 | 4.08E+02 | 94.78 | 2.75E-02 | 2.38E-03 |
| m | 3 | 77.23 | 5.81E+02 | 100.31 | 2.75E-02 | 2.41E-03 |
| M | 4 | 86.70 | 4.51E+02 | 107.48 | 2.74E-02 | 2.51E-03 |
| m | 5 | 92.72 | 5.34E+02 | 109.16 | 2.73E-02 | 2.44E-03 |
| | 6 | 127.89 | 1.46E+02 | 114.36 | 2.54E-02 | 1.94E-03 |
| | 7 | 185.81 | 1.72E+02 | 84.85 | 2.17E-02 | 1.68E-03 |
| | 8 | 208.53 | 1.50E+02 | 73.84 | 2.04E-02 | 1.61E-03 |
| M | 9 | 230.10 | 5.22E+01 | 38.63 | 1.93E-02 | 1.55E-03 |
| m | 10 | 238.62 | 9.36E+02 | 80.69 | 1.89E-02 | 1.53E-03 |
| m | 11 | 241.67 | 2.11E+02 | 83.94 | 1.87E-02 | 1.52E-03 |
| | 12 | 270.73 | 1.57E+02 | 64.55 | 1.74E-02 | 1.43E-03 |
| M | 13 | 295.28 | 3.33E+02 | 54.71 | 1.64E-02 | 1.37E-03 |
| m | 14 | 300.28 | 8.73E+01 | 44.73 | 1.62E-02 | 1.36E-03 |
| | 15 | 327.92 | 6.22E+01 | 48.95 | 1.53E-02 | 1.29E-03 |
| | 16 | 339.27 | 1.77E+02 | 66.01 | 1.49E-02 | 1.27E-03 |
| | 17 | 351.79 | 4.57E+02 | 76.06 | 1.45E-02 | 1.24E-03 |
| | 18 | 389.29 | 6.18E+01 | 51.87 | 1.35E-02 | 1.15E-03 |
| | 19 | 461.82 | 7.48E+01 | 59.73 | 1.19E-02 | 1.10E-03 |
| | 20 | 491.11 | 2.47E+01 | 29.00 | 1.14E-02 | 1.08E-03 |
| | 21 | 511.13 | 2.09E+02 | 57.54 | 1.10E-02 | 1.07E-03 |
| | 22 | 561.56 | 3.05E+01 | 36.99 | 1.03E-02 | 1.04E-03 |
| | 23 | 583.61 | 3.16E+02 | 60.22 | 9.96E-03 | 1.02E-03 |
| | 24 | 609.42 | 3.52E+02 | 60.59 | 9.63E-03 | 1.01E-03 |
| | 25 | 661.48 | 9.60E+01 | 42.99 | 9.04E-03 | 9.72E-04 |
| | 26 | 713.05 | 2.96E+01 | 25.99 | 8.54E-03 | 8.90E-04 |
| | 27 | 727.29 | 5.00E+01 | 38.14 | 8.41E-03 | 8.68E-04 |
| | 28 | 769.68 | 5.40E+01 | 44.59 | 8.05E-03 | 8.00E-04 |
| | 29 | 794.73 | 3.99E+01 | 28.07 | 7.86E-03 | 7.61E-04 |
| M | 30 | 861.00 | 4.18E+01 | 29.80 | 7.40E-03 | 6.55E-04 |
| m | 31 | 864.40 | 2.22E+01 | 25.00 | 7.37E-03 | 6.50E-04 |
| | 32 | 911.57 | 1.81E+02 | 51.38 | 7.08E-03 | 5.91E-04 |
| M | 33 | 924.04 | 2.44E+01 | 24.58 | 7.01E-03 | 5.86E-04 |
| m | 34 | 934.88 | 4.63E+01 | 25.61 | 6.95E-03 | 5.82E-04 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 35 | 955.15 | 1.90E+01 | 16.95 | 6.84E-03 | 5.75E-04 |
| M | 36 | 964.65 | 7.28E+01 | 29.63 | 6.79E-03 | 5.71E-04 |
| m | 37 | 969.46 | 1.37E+02 | 31.11 | 6.76E-03 | 5.69E-04 |
| | 38 | 1121.07 | 1.02E+02 | 42.43 | 6.07E-03 | 5.11E-04 |
| | 39 | 1238.24 | 5.60E+01 | 32.62 | 5.64E-03 | 4.76E-04 |
| | 40 | 1378.14 | 1.84E+01 | 15.82 | 5.22E-03 | 4.44E-04 |
| M | 41 | 1402.72 | 1.36E+01 | 15.42 | 5.15E-03 | 4.38E-04 |
| m | 42 | 1409.46 | 2.28E+01 | 16.67 | 5.14E-03 | 4.37E-04 |
| m | 43 | 1415.75 | 1.23E+01 | 14.06 | 5.12E-03 | 4.35E-04 |
| M | 44 | 1461.34 | 9.95E+02 | 64.79 | 5.00E-03 | 4.25E-04 |
| m | 45 | 1465.34 | 3.17E+01 | 49.68 | 4.99E-03 | 4.24E-04 |
| | 46 | 1539.80 | 1.77E+01 | 16.12 | 4.82E-03 | 4.06E-04 |
| | 47 | 1581.34 | 5.75E+00 | 6.67 | 4.73E-03 | 3.97E-04 |
| | 48 | 1588.05 | 1.65E+01 | 14.90 | 4.72E-03 | 3.95E-04 |
| | 49 | 1593.21 | 1.18E+01 | 12.29 | 4.70E-03 | 3.94E-04 |
| | 50 | 1622.05 | 1.31E+01 | 12.00 | 4.64E-03 | 3.87E-04 |
| M | 51 | 1659.77 | 8.09E+00 | 5.34 | 4.57E-03 | 3.79E-04 |
| m | 52 | 1662.99 | 9.82E+00 | 9.62 | 4.56E-03 | 3.78E-04 |
| | 53 | 1765.12 | 7.27E+01 | 19.87 | 4.37E-03 | 3.54E-04 |
| | 54 | 1840.31 | 7.00E+00 | 7.21 | 4.25E-03 | 3.38E-04 |
| | 55 | 1848.20 | 1.26E+01 | 8.72 | 4.23E-03 | 3.38E-04 |
| | 56 | 1957.58 | 7.75E+00 | 7.76 | 4.06E-03 | 3.38E-04 |
| | 57 | 2119.72 | 5.00E+00 | 7.40 | 3.84E-03 | 3.38E-04 |
| | 58 | 2204.85 | 2.47E+01 | 13.74 | 3.74E-03 | 3.38E-04 |
| | 59 | 2405.53 | 6.44E+00 | 6.65 | 3.51E-03 | 3.38E-04 |
| | 60 | 2449.08 | 6.00E+00 | 4.90 | 3.47E-03 | 3.38E-04 |
| | 61 | 2615.30 | 9.47E+01 | 20.21 | 3.31E-03 | 3.38E-04 |
| | 62 | 3114.18 | 5.00E+00 | 4.47 | 2.91E-03 | 3.38E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 12:06:18PM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 62.46 | 2.79E+02 | 134.61 | 8.94E+01 | 1.41E+01 | 1.90E+02 | 1.35E+02 |
| M | 2 | 74.72 | 4.08E+02 | 94.78 | | | 4.08E+02 | 9.48E+01 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| m | 3 | 77.23 | 5.81E+02 | 100.31 | 7.20E+00 | 1.47E+00 | 5.74E+02 | 1.00E+02 |
| M | 4 | 86.70 | 4.51E+02 | 107.48 | | | 4.51E+02 | 1.07E+02 |
| m | 5 | 92.72 | 5.34E+02 | 109.16 | 1.38E+02 | 1.72E+01 | 3.96E+02 | 1.11E+02 |
| | 6 | 127.89 | 1.46E+02 | 114.36 | | | 1.46E+02 | 1.14E+02 |
| | 7 | 185.81 | 1.72E+02 | 84.85 | 5.22E+01 | 7.59E+00 | 1.19E+02 | 8.52E+01 |
| | 8 | 208.53 | 1.50E+02 | 73.84 | | | 1.50E+02 | 7.38E+01 |
| M | 9 | 230.10 | 5.22E+01 | 38.63 | | | 5.22E+01 | 3.86E+01 |
| m | 10 | 238.62 | 9.36E+02 | 80.69 | 2.13E+01 | 6.33E+00 | 9.15E+02 | 8.09E+01 |
| m | 11 | 241.67 | 2.11E+02 | 83.94 | | | 2.11E+02 | 8.39E+01 |
| | 12 | 270.73 | 1.57E+02 | 64.55 | 1.23E+00 | 4.98E+00 | 1.56E+02 | 6.47E+01 |
| M | 13 | 295.28 | 3.33E+02 | 54.71 | | | 3.33E+02 | 5.47E+01 |
| m | 14 | 300.28 | 8.73E+01 | 44.73 | | | 8.73E+01 | 4.47E+01 |
| | 15 | 327.92 | 6.22E+01 | 48.95 | | | 6.22E+01 | 4.89E+01 |
| | 16 | 339.27 | 1.77E+02 | 66.01 | | | 1.77E+02 | 6.60E+01 |
| | 17 | 351.79 | 4.57E+02 | 76.06 | 5.79E+00 | 4.49E+00 | 4.52E+02 | 7.62E+01 |
| | 18 | 389.29 | 6.18E+01 | 51.87 | | | 6.18E+01 | 5.19E+01 |
| | 19 | 461.82 | 7.48E+01 | 59.73 | | | 7.48E+01 | 5.97E+01 |
| | 20 | 491.11 | 2.47E+01 | 29.00 | | | 2.47E+01 | 2.90E+01 |
| | 21 | 511.13 | 2.09E+02 | 57.54 | 7.28E+01 | 5.30E+00 | 1.37E+02 | 5.78E+01 |
| | 22 | 561.56 | 3.05E+01 | 36.99 | | | 3.05E+01 | 3.70E+01 |
| | 23 | 583.61 | 3.16E+02 | 60.22 | 2.72E+00 | 3.05E+00 | 3.13E+02 | 6.03E+01 |
| | 24 | 609.42 | 3.52E+02 | 60.59 | 6.35E+00 | 4.02E+00 | 3.46E+02 | 6.07E+01 |
| | 25 | 661.48 | 9.60E+01 | 42.99 | | | 9.60E+01 | 4.30E+01 |
| | 26 | 713.05 | 2.96E+01 | 25.99 | | | 2.96E+01 | 2.60E+01 |
| | 27 | 727.29 | 5.00E+01 | 38.14 | | | 5.00E+01 | 3.81E+01 |
| | 28 | 769.68 | 5.40E+01 | 44.59 | | | 5.40E+01 | 4.46E+01 |
| | 29 | 794.73 | 3.99E+01 | 28.07 | | | 3.99E+01 | 2.81E+01 |
| M | 30 | 861.00 | 4.18E+01 | 29.80 | | | 4.18E+01 | 2.98E+01 |
| m | 31 | 864.40 | 2.22E+01 | 25.00 | | | 2.22E+01 | 2.50E+01 |
| | 32 | 911.57 | 1.81E+02 | 51.38 | 5.31E+00 | 3.00E+00 | 1.76E+02 | 5.15E+01 |
| M | 33 | 924.04 | 2.44E+01 | 24.58 | | | 2.44E+01 | 2.46E+01 |
| m | 34 | 934.88 | 4.63E+01 | 25.61 | | | 4.63E+01 | 2.56E+01 |
| | 35 | 955.15 | 1.90E+01 | 16.95 | | | 1.90E+01 | 1.69E+01 |
| M | 36 | 964.65 | 7.28E+01 | 29.63 | | | 7.28E+01 | 2.96E+01 |
| m | 37 | 969.46 | 1.37E+02 | 31.11 | | | 1.37E+02 | 3.11E+01 |
| | 38 | 1121.07 | 1.02E+02 | 42.43 | | | 1.02E+02 | 4.24E+01 |
| | 39 | 1238.24 | 5.60E+01 | 32.62 | | | 5.60E+01 | 3.26E+01 |
| | 40 | 1378.14 | 1.84E+01 | 15.82 | | | 1.84E+01 | 1.58E+01 |
| M | 41 | 1402.72 | 1.36E+01 | 15.42 | | | 1.36E+01 | 1.54E+01 |
| m | 42 | 1409.46 | 2.28E+01 | 16.67 | | | 2.28E+01 | 1.67E+01 |
| m | 43 | 1415.75 | 1.23E+01 | 14.06 | | | 1.23E+01 | 1.41E+01 |
| M | 44 | 1461.34 | 9.95E+02 | 64.79 | 8.09E+00 | 2.23E+00 | 9.87E+02 | 6.48E+01 |
| m | 45 | 1465.34 | 3.17E+01 | 49.68 | | | 3.17E+01 | 4.97E+01 |
| | 46 | 1539.80 | 1.77E+01 | 16.12 | | | 1.77E+01 | 1.61E+01 |
| | 47 | 1581.34 | 5.75E+00 | 6.67 | | | 5.75E+00 | 6.67E+00 |
| | 48 | 1588.05 | 1.65E+01 | 14.90 | | | 1.65E+01 | 1.49E+01 |
| | 49 | 1593.21 | 1.18E+01 | 12.29 | | | 1.18E+01 | 1.23E+01 |
| | 50 | 1622.05 | 1.31E+01 | 12.00 | | | 1.31E+01 | 1.20E+01 |
| M | 51 | 1659.77 | 8.09E+00 | 5.34 | | | 8.09E+00 | 5.34E+00 |
| m | 52 | 1662.99 | 9.82E+00 | 9.62 | | | 9.82E+00 | 9.62E+00 |
| | 53 | 1765.12 | 7.27E+01 | 19.87 | | | 7.27E+01 | 1.99E+01 |
| | 54 | 1840.31 | 7.00E+00 | 7.21 | | | 7.00E+00 | 7.21E+00 |
| | 55 | 1848.20 | 1.26E+01 | 8.72 | | | 1.26E+01 | 8.72E+00 |
| | 56 | 1957.58 | 7.75E+00 | 7.76 | | | 7.75E+00 | 7.76E+00 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|
| 57 | 2119.72 | 5.00E+00 | 7.40 | | | 5.00E+00 | 7.40E+00 |
| 58 | 2204.85 | 2.47E+01 | 13.74 | | | 2.47E+01 | 1.37E+01 |
| 59 | 2405.53 | 6.44E+00 | 6.65 | | | 6.44E+00 | 6.65E+00 |
| 60 | 2449.08 | 6.00E+00 | 4.90 | | | 6.00E+00 | 4.90E+00 |
| 61 | 2615.30 | 9.47E+01 | 20.21 | 5.63E+00 | 1.38E+00 | 8.91E+01 | 2.03E+01 |
| 62 | 3114.18 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 12:06:18PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 62.46 | 2.79E+02 | 134.61 | 8.94E+01 | 1.41E+01 | 1.90E+02 | 1.35E+02 |
| M | 2 | 74.72 | 4.08E+02 | 94.78 | | | 4.08E+02 | 9.48E+01 |
| m | 3 | 77.23 | 5.81E+02 | 100.31 | 7.20E+00 | 1.47E+00 | 5.74E+02 | 1.00E+02 |
| M | 4 | 86.70 | 4.51E+02 | 107.48 | | | 4.51E+02 | 1.07E+02 |
| m | 5 | 92.72 | 5.34E+02 | 109.16 | 1.38E+02 | 1.72E+01 | 3.96E+02 | 1.11E+02 |
| | 6 | 127.89 | 1.46E+02 | 114.36 | | | 1.46E+02 | 1.14E+02 |
| | 7 | 185.81 | 1.72E+02 | 84.85 | 5.22E+01 | 7.59E+00 | 1.19E+02 | 8.52E+01 |
| | 8 | 208.53 | 1.50E+02 | 73.84 | | | 1.50E+02 | 7.38E+01 |
| M | 9 | 230.10 | 5.22E+01 | 38.63 | | | 5.22E+01 | 3.86E+01 |
| m | 10 | 238.62 | 9.36E+02 | 80.69 | 2.13E+01 | 6.33E+00 | 9.15E+02 | 8.09E+01 |
| m | 11 | 241.67 | 2.11E+02 | 83.94 | | | 2.11E+02 | 8.39E+01 |
| | 12 | 270.73 | 1.57E+02 | 64.55 | 1.23E+00 | 4.98E+00 | 1.56E+02 | 6.47E+01 |
| M | 13 | 295.28 | 3.33E+02 | 54.71 | | | 3.33E+02 | 5.47E+01 |
| m | 14 | 300.28 | 8.73E+01 | 44.73 | | | 8.73E+01 | 4.47E+01 |
| | 15 | 327.92 | 6.22E+01 | 48.95 | | | 6.22E+01 | 4.89E+01 |
| | 16 | 339.27 | 1.77E+02 | 66.01 | | | 1.77E+02 | 6.60E+01 |
| | 17 | 351.79 | 4.57E+02 | 76.06 | 5.79E+00 | 4.49E+00 | 4.52E+02 | 7.62E+01 |
| | 18 | 389.29 | 6.18E+01 | 51.87 | | | 6.18E+01 | 5.19E+01 |
| | 19 | 461.82 | 7.48E+01 | 59.73 | | | 7.48E+01 | 5.97E+01 |
| | 20 | 491.11 | 2.47E+01 | 29.00 | | | 2.47E+01 | 2.90E+01 |
| | 21 | 511.13 | 2.09E+02 | 57.54 | 7.28E+01 | 5.30E+00 | 1.37E+02 | 5.78E+01 |
| | 22 | 561.56 | 3.05E+01 | 36.99 | | | 3.05E+01 | 3.70E+01 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 23 | 583.61 | 3.16E+02 | 60.22 | 2.72E+00 | 3.05E+00 | 3.13E+02 | 6.03E+01 |
| | 24 | 609.42 | 3.52E+02 | 60.59 | 6.35E+00 | 4.02E+00 | 3.46E+02 | 6.07E+01 |
| | 25 | 661.48 | 9.60E+01 | 42.99 | | | 9.60E+01 | 4.30E+01 |
| | 26 | 713.05 | 2.96E+01 | 25.99 | | | 2.96E+01 | 2.60E+01 |
| | 27 | 727.29 | 5.00E+01 | 38.14 | | | 5.00E+01 | 3.81E+01 |
| | 28 | 769.68 | 5.40E+01 | 44.59 | | | 5.40E+01 | 4.46E+01 |
| | 29 | 794.73 | 3.99E+01 | 28.07 | | | 3.99E+01 | 2.81E+01 |
| M | 30 | 861.00 | 4.18E+01 | 29.80 | | | 4.18E+01 | 2.98E+01 |
| m | 31 | 864.40 | 2.22E+01 | 25.00 | | | 2.22E+01 | 2.50E+01 |
| | 32 | 911.57 | 1.81E+02 | 51.38 | 5.31E+00 | 3.00E+00 | 1.76E+02 | 5.15E+01 |
| M | 33 | 924.04 | 2.44E+01 | 24.58 | | | 2.44E+01 | 2.46E+01 |
| m | 34 | 934.88 | 4.63E+01 | 25.61 | | | 4.63E+01 | 2.56E+01 |
| | 35 | 955.15 | 1.90E+01 | 16.95 | | | 1.90E+01 | 1.69E+01 |
| M | 36 | 964.65 | 7.28E+01 | 29.63 | | | 7.28E+01 | 2.96E+01 |
| m | 37 | 969.46 | 1.37E+02 | 31.11 | | | 1.37E+02 | 3.11E+01 |
| | 38 | 1121.07 | 1.02E+02 | 42.43 | | | 1.02E+02 | 4.24E+01 |
| | 39 | 1238.24 | 5.60E+01 | 32.62 | | | 5.60E+01 | 3.26E+01 |
| | 40 | 1378.14 | 1.84E+01 | 15.82 | | | 1.84E+01 | 1.58E+01 |
| M | 41 | 1402.72 | 1.36E+01 | 15.42 | | | 1.36E+01 | 1.54E+01 |
| m | 42 | 1409.46 | 2.28E+01 | 16.67 | | | 2.28E+01 | 1.67E+01 |
| m | 43 | 1415.75 | 1.23E+01 | 14.06 | | | 1.23E+01 | 1.41E+01 |
| M | 44 | 1461.34 | 9.95E+02 | 64.79 | 8.09E+00 | 2.23E+00 | 9.87E+02 | 6.48E+01 |
| m | 45 | 1465.34 | 3.17E+01 | 49.68 | | | 3.17E+01 | 4.97E+01 |
| | 46 | 1539.80 | 1.77E+01 | 16.12 | | | 1.77E+01 | 1.61E+01 |
| | 47 | 1581.34 | 5.75E+00 | 6.67 | | | 5.75E+00 | 6.67E+00 |
| | 48 | 1588.05 | 1.65E+01 | 14.90 | | | 1.65E+01 | 1.49E+01 |
| | 49 | 1593.21 | 1.18E+01 | 12.29 | | | 1.18E+01 | 1.23E+01 |
| | 50 | 1622.05 | 1.31E+01 | 12.00 | | | 1.31E+01 | 1.20E+01 |
| M | 51 | 1659.77 | 8.09E+00 | 5.34 | | | 8.09E+00 | 5.34E+00 |
| m | 52 | 1662.99 | 9.82E+00 | 9.62 | | | 9.82E+00 | 9.62E+00 |
| | 53 | 1765.12 | 7.27E+01 | 19.87 | | | 7.27E+01 | 1.99E+01 |
| | 54 | 1840.31 | 7.00E+00 | 7.21 | | | 7.00E+00 | 7.21E+00 |
| | 55 | 1848.20 | 1.26E+01 | 8.72 | | | 1.26E+01 | 8.72E+00 |
| | 56 | 1957.58 | 7.75E+00 | 7.76 | | | 7.75E+00 | 7.76E+00 |
| | 57 | 2119.72 | 5.00E+00 | 7.40 | | | 5.00E+00 | 7.40E+00 |
| | 58 | 2204.85 | 2.47E+01 | 13.74 | | | 2.47E+01 | 1.37E+01 |
| | 59 | 2405.53 | 6.44E+00 | 6.65 | | | 6.44E+00 | 6.65E+00 |
| | 60 | 2449.08 | 6.00E+00 | 4.90 | | | 6.00E+00 | 4.90E+00 |
| | 61 | 2615.30 | 9.47E+01 | 20.21 | 5.63E+00 | 1.38E+00 | 8.91E+01 | 2.03E+01 |
| | 62 | 3114.18 | 5.00E+00 | 4.47 | | | 5.00E+00 | 4.47E+00 |

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

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.956 | 1460.81 | * | 10.67 | 2.03E+01 | 2.22E+00 |
| SN-126 | 0.886 | 87.57 | * | 37.00 | 4.89E-01 | 1.25E-01 |
| CS-137 | 0.996 | 661.65 | * | 85.12 | 1.38E-01 | 6.36E-02 |
| EU-155 | 0.359 | 86.50 | * | 30.90 | 6.08E-01 | 1.55E-01 |
| | | 105.30 | | 20.70 | | |
| TL-208 | 0.948 | 583.14 | * | 30.22 | 1.14E+00 | 2.50E-01 |
| | | 860.37 | * | 4.48 | 1.39E+00 | 9.97E-01 |
| | | 2614.66 | * | 35.85 | 8.27E-01 | 2.06E-01 |
| BI-212 | 0.762 | 727.17 | * | 11.80 | 5.54E-01 | 4.27E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 1.000 | 238.63 | * | 44.60 | 1.20E+00 | 1.43E-01 |
| | | 300.09 | * | 3.41 | 1.73E+00 | 9.00E-01 |
| BI-214 | 0.966 | 609.31 | * | 46.30 | 8.52E-01 | 1.74E-01 |
| | | 1120.29 | * | 15.10 | 1.23E+00 | 5.20E-01 |
| | | 1764.49 | * | 15.80 | 1.16E+00 | 3.30E-01 |
| | | 2204.22 | * | 4.98 | 1.46E+00 | 8.23E-01 |
| PB-214 | 0.998 | 295.21 | * | 19.19 | 1.16E+00 | 2.14E-01 |
| | | 351.92 | * | 37.19 | 9.18E-01 | 1.74E-01 |
| RA-224 | 0.926 | 240.98 | * | 3.95 | 3.15E+00 | 1.27E+00 |
| RA-226 | 0.974 | 186.21 | * | 3.28 | 1.84E+00 | 3.62E+00 |
| AC-228 | 0.946 | 338.32 | * | 11.40 | 1.14E+00 | 4.38E-01 |
| | | 911.07 | * | 27.70 | 9.84E-01 | 3.00E-01 |
| | | 969.11 | * | 16.60 | 1.34E+00 | 3.25E-01 |
| TH-234 | 0.896 | 63.29 | * | 3.80 | 2.04E+00 | 1.46E+00 |
| NP-237 | 0.994 | 86.50 | * | 12.60 | 1.44E+00 | 3.66E-01 |
| AM-243 | 1.000 | 74.67 | * | 66.00 | 2.47E-01 | 6.14E-02 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 12:06:18PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| m | 3 | 77.23 | 1.59443E-01 | 8.74 | | |
| m | 5 | 92.72 | 1.10064E-01 | 13.94 | Tol. | GA-67 |
| | 6 | 127.89 | 4.05300E-02 | 39.19 | | |
| | 8 | 208.53 | 4.16810E-02 | 24.60 | Tol. | GA-67 |
| M | 9 | 230.10 | 1.45020E-02 | 36.99 | | |
| | 12 | 270.73 | 4.33995E-02 | 20.72 | | |
| | 15 | 327.92 | 1.72786E-02 | 39.35 | Sum | |
| | 18 | 389.29 | 1.71537E-02 | 41.99 | | |
| | 19 | 461.82 | 2.07798E-02 | 39.92 | | |
| | 20 | 491.11 | 6.84861E-03 | 58.81 | | |
| | 21 | 511.13 | 3.79395E-02 | 21.15 | | |
| | 22 | 561.56 | 8.47222E-03 | 60.63 | | |
| | 26 | 713.05 | 8.21181E-03 | 43.95 | | |
| | 28 | 769.68 | 1.50035E-02 | 41.27 | Sum | |
| | 29 | 794.73 | 1.10932E-02 | 35.15 | Sum | |
| m | 31 | 864.40 | 6.17718E-03 | 56.21 | | |
| M | 33 | 924.04 | 6.77099E-03 | 50.41 | Sum | |
| m | 34 | 934.88 | 1.28492E-02 | 27.68 | Sum | |
| | 35 | 955.15 | 5.27778E-03 | 44.60 | | |
| M | 36 | 964.65 | 2.02083E-02 | 20.36 | Tol. | EU-152 |
| | 39 | 1238.24 | 1.55556E-02 | 29.12 | Tol. | CO-56 |
| | 40 | 1378.14 | 5.11508E-03 | 42.95 | | |
| M | 41 | 1402.72 | 3.77859E-03 | 56.68 | | |
| m | 42 | 1409.46 | 6.32526E-03 | 36.59 | | |
| m | 43 | 1415.75 | 3.42755E-03 | 56.98 | Sum | |
| m | 45 | 1465.34 | 8.80107E-03 | 78.40 | | |
| | 46 | 1539.80 | 4.92337E-03 | 45.49 | | |
| | 47 | 1581.34 | 1.59722E-03 | 58.01 | | |
| | 48 | 1588.05 | 4.57437E-03 | 45.24 | Sum | |
| | 49 | 1593.21 | 3.28283E-03 | 51.99 | D-Esc | |
| | 50 | 1622.05 | 3.63889E-03 | 45.80 | | |
| M | 51 | 1659.77 | 2.24757E-03 | 32.99 | | |
| m | 52 | 1662.99 | 2.72888E-03 | 48.95 | | |
| | 54 | 1840.31 | 1.94444E-03 | 51.51 | Sum | |
| | 55 | 1848.20 | 3.50000E-03 | 34.59 | Sum | |
| | 56 | 1957.58 | 2.15278E-03 | 50.08 | | |
| | 57 | 2119.72 | 1.38889E-03 | 73.99 | | |
| | 59 | 2405.53 | 1.78819E-03 | 51.67 | | |
| | 60 | 2449.08 | 1.66667E-03 | 40.82 | | |
| | 62 | 3114.18 | 1.38889E-03 | 44.72 | | |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.95 | 1460.81 | * | 10.67 | 2.03E+01 | 2.22E+00 |
| SN-126 | 0.88 | 87.57 | * | 37.00 | 4.89E-01 | 1.25E-01 |
| CS-137 | 0.99 | 661.65 | * | 85.12 | 1.38E-01 | 6.36E-02 |
| EU-155 | 0.35 | 86.50 | * | 30.90 | 6.08E-01 | 1.55E-01 |
| | | 105.30 | | 20.70 | | |
| TL-208 | 0.94 | 583.14 | * | 30.22 | 1.14E+00 | 2.50E-01 |
| | | 860.37 | * | 4.48 | 1.39E+00 | 9.97E-01 |
| | | 2614.66 | * | 35.85 | 8.27E-01 | 2.06E-01 |
| BI-212 | 0.76 | 727.17 | * | 11.80 | 5.54E-01 | 4.27E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 1.00 | 238.63 | * | 44.60 | 1.20E+00 | 1.43E-01 |
| | | 300.09 | * | 3.41 | 1.73E+00 | 9.00E-01 |
| BI-214 | 0.96 | 609.31 | * | 46.30 | 8.52E-01 | 1.74E-01 |
| | | 1120.29 | * | 15.10 | 1.23E+00 | 5.20E-01 |
| | | 1764.49 | * | 15.80 | 1.16E+00 | 3.30E-01 |
| | | 2204.22 | * | 4.98 | 1.46E+00 | 8.23E-01 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 1.16E+00 | 2.14E-01 |
| | | 351.92 | * | 37.19 | 9.18E-01 | 1.74E-01 |
| RA-224 | 0.92 | 240.98 | * | 3.95 | 3.15E+00 | 1.27E+00 |
| RA-226 | 0.97 | 186.21 | * | 3.28 | 1.84E+00 | 3.62E+00 |
| AC-228 | 0.94 | 338.32 | * | 11.40 | 1.14E+00 | 4.38E-01 |
| | | 911.07 | * | 27.70 | 9.84E-01 | 3.00E-01 |
| | | 969.11 | * | 16.60 | 1.34E+00 | 3.25E-01 |
| TH-234 | 0.89 | 63.29 | * | 3.80 | 2.04E+00 | 1.46E+00 |
| NP-237 | 0.99 | 86.50 | * | 12.60 | 1.44E+00 | 3.66E-01 |
| AM-243 | 1.00 | 74.67 | * | 66.00 | 2.47E-01 | 6.14E-02 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.956 | 2.03E+01 | 2.22E+00 | |
| ? | SN-126 | 0.886 | 4.89E-01 | 1.25E-01 | |
| | CS-137 | 0.996 | 1.38E-01 | 6.36E-02 | |
| ? | EU-155 | 0.359 | 6.08E-01 | 1.55E-01 | |
| | TL-208 | 0.948 | 9.66E-01 | 1.57E-01 | |
| | BI-212 | 0.762 | 5.54E-01 | 4.27E-01 | |
| | PB-212 | 1.000 | 1.21E+00 | 1.42E-01 | |
| | BI-214 | 0.966 | 9.60E-01 | 1.45E-01 | |
| | PB-214 | 0.998 | 1.01E+00 | 1.35E-01 | |
| | RA-224 | 0.926 | 3.15E+00 | 1.27E+00 | |
| | RA-226 | 0.974 | 1.84E+00 | 3.62E+00 | |
| | AC-228 | 0.946 | 1.15E+00 | 1.97E-01 | |
| | TH-234 | 0.896 | 2.04E+00 | 1.46E+00 | |
| ? | NP-237 | 0.994 | 1.44E+00 | 3.66E-01 | |
| | AM-243 | 1.000 | 2.47E-01 | 6.14E-02 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 12:06:18PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| m | 3 | 77.23 | 1.59443E-01 | 8.74 | | |
| m | 5 | 92.72 | 1.10064E-01 | 13.94 | Tol. | GA-67 |
| | 6 | 127.89 | 4.05300E-02 | 39.19 | | |
| | 8 | 208.53 | 4.16810E-02 | 24.60 | Tol. | GA-67 |
| M | 9 | 230.10 | 1.45020E-02 | 36.99 | | |
| | 12 | 270.73 | 4.33995E-02 | 20.72 | | |
| | 15 | 327.92 | 1.72786E-02 | 39.35 | Sum | |
| | 18 | 389.29 | 1.71537E-02 | 41.99 | | |
| | 19 | 461.82 | 2.07798E-02 | 39.92 | | |
| | 20 | 491.11 | 6.84861E-03 | 58.81 | | |
| | 21 | 511.13 | 3.79395E-02 | 21.15 | | |
| | 22 | 561.56 | 8.47222E-03 | 60.63 | | |
| | 26 | 713.05 | 8.21181E-03 | 43.95 | | |
| | 28 | 769.68 | 1.50035E-02 | 41.27 | Sum | |
| | 29 | 794.73 | 1.10932E-02 | 35.15 | Sum | |
| m | 31 | 864.40 | 6.17718E-03 | 56.21 | | |
| M | 33 | 924.04 | 6.77099E-03 | 50.41 | Sum | |
| m | 34 | 934.88 | 1.28492E-02 | 27.68 | Sum | |
| | 35 | 955.15 | 5.27778E-03 | 44.60 | | |
| M | 36 | 964.65 | 2.02083E-02 | 20.36 | Tol. | EU-152 |
| | 39 | 1238.24 | 1.55556E-02 | 29.12 | Tol. | CO-56 |
| | 40 | 1378.14 | 5.11508E-03 | 42.95 | | |
| M | 41 | 1402.72 | 3.77859E-03 | 56.68 | | |
| m | 42 | 1409.46 | 6.32526E-03 | 36.59 | | |
| m | 43 | 1415.75 | 3.42755E-03 | 56.98 | Sum | |
| m | 45 | 1465.34 | 8.80107E-03 | 78.40 | | |
| | 46 | 1539.80 | 4.92337E-03 | 45.49 | | |
| | 47 | 1581.34 | 1.59722E-03 | 58.01 | | |
| | 48 | 1588.05 | 4.57437E-03 | 45.24 | Sum | |
| | 49 | 1593.21 | 3.28283E-03 | 51.99 | D-Esc | |
| | 50 | 1622.05 | 3.63889E-03 | 45.80 | | |
| M | 51 | 1659.77 | 2.24757E-03 | 32.99 | | |
| m | 52 | 1662.99 | 2.72888E-03 | 48.95 | | |
| | 54 | 1840.31 | 1.94444E-03 | 51.51 | Sum | |
| | 55 | 1848.20 | 3.50000E-03 | 34.59 | Sum | |

Analysis Report for 1707087-12

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| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 56 | 1957.58 | 2.15278E-03 | 50.08 | | |
| 57 | 2119.72 | 1.38889E-03 | 73.99 | | |
| 59 | 2405.53 | 1.78819E-03 | 51.67 | | |
| 60 | 2449.08 | 1.66667E-03 | 40.82 | | |
| 62 | 3114.18 | 1.38889E-03 | 44.72 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | | 10.42 | 3.81E-01 | 1.84E+00 | 1.84E+00 |
| + | NA-22 | 1274.54 | | 99.94 | 7.54E-03 | 7.41E-02 | 7.41E-02 |
| + | @ NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | AL-26 | 1808.65 | | 99.76 | 1.03E-02 | 3.85E-02 | 3.85E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 2.03E+01 | 9.37E-01 | 9.37E-01 |
| + | @ AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | TI-44 | 67.88 | | 94.40 | 3.64E-03 | 5.41E-02 | 5.41E-02 |
| | | 78.34 | | 96.00 | 1.49E-01 | | 6.97E-02 |
| + | SC-46 | 889.25 | | 99.98 | 4.95E-02 | 1.31E-01 | 1.31E-01 |
| | | 1120.51 | | 99.99 | 3.95E-01 | | 2.48E-01 |
| + | V-48 | 983.52 | | 99.98 | -2.44E-01 | 4.43E+00 | 4.50E+00 |
| | | 1312.10 | | 97.50 | -2.21E+00 | | 4.43E+00 |
| + | CR-51 | 320.08 | | 9.83 | 2.59E-01 | 6.09E+00 | 6.09E+00 |
| + | MN-54 | 834.83 | | 99.97 | -2.10E-02 | 7.39E-02 | 7.39E-02 |
| + | CO-56 | 846.75 | | 99.96 | 4.21E-02 | 1.45E-01 | 1.45E-01 |
| | | 1037.75 | | 14.03 | -3.07E-01 | | 9.60E-01 |
| | | 1238.25 | | 67.00 | 2.68E-01 | | 3.35E-01 |
| | | 1771.40 | | 15.51 | -3.89E-02 | | 6.18E-01 |
| | | 2598.48 | | 16.90 | 2.64E-02 | | 7.45E-01 |
| + | CO-57 | 122.06 | | 85.51 | 5.80E-03 | 6.23E-02 | 6.23E-02 |
| | | 136.48 | | 10.60 | 1.63E-01 | | 5.13E-01 |
| + | CO-58 | 810.76 | | 99.40 | 8.16E-03 | 1.49E-01 | 1.49E-01 |
| + | FE-59 | 1099.22 | | 56.50 | -1.96E-01 | 5.59E-01 | 5.59E-01 |

Analysis Report for 1707087-12

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| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | FE-59 | 1291.56 | 43.20 | -1.20E-01 | 5.59E-01 | 6.66E-01 |
| + | CO-60 | 1173.22 | 100.00 | -3.68E-02 | 5.63E-02 | 7.29E-02 |
| | | 1332.49 | 100.00 | 6.43E-03 | | 5.63E-02 |
| + | ZN-65 | 1115.52 | 50.75 | 7.28E-03 | 1.80E-01 | 1.80E-01 |
| + | GA-67 | 93.31 | 35.70 | 5.14E+08 | 2.33E+08 | 2.33E+08 |
| | | 208.95 | 2.24 | 4.22E+09 | | 3.30E+09 |
| | | 300.22 | 16.00 | -6.30E+08 | | 4.98E+08 |
| + | SE-75 | 121.11 | 16.70 | 3.44E-02 | 1.26E-01 | 4.33E-01 |
| | | 136.00 | 59.20 | 4.02E-02 | | 1.26E-01 |
| | | 264.65 | 59.80 | 1.52E-02 | | 1.45E-01 |
| | | 279.53 | 25.20 | 2.55E-01 | | 3.81E-01 |
| | | 400.65 | 11.40 | 3.25E-01 | | 8.30E-01 |
| + | RB-82 | 776.52 | 13.00 | 8.89E-01 | 6.59E+00 | 6.59E+00 |
| + | RB-83 | 520.41 | 46.00 | 7.47E-03 | 2.46E-01 | 2.46E-01 |
| | | 529.64 | 30.30 | 6.92E-02 | | 3.70E-01 |
| | | 552.65 | 16.40 | 3.25E-01 | | 7.70E-01 |
| + | KR-85 | 513.99 | 0.43 | 2.30E+01 | 1.79E+01 | 1.79E+01 |
| + | SR-85 | 513.99 | 99.27 | 2.85E-01 | 2.22E-01 | 2.22E-01 |
| + | Y-88 | 898.02 | 93.40 | 9.16E-03 | 5.96E-02 | 1.14E-01 |
| | | 1836.01 | 99.38 | 0.00E+00 | | 5.96E-02 |
| + | MO-93 | 263.06 | 56.72 | 1.48E-03 | 4.43E-02 | 8.96E-02 |
| | | 684.67 | 99.68 | -1.89E-02 | | 6.00E-02 |
| | | 1477.11 | 99.08 | -2.05E-02 | | 4.43E-02 |
| + | NB-93M | 16.57 | 9.43 | -1.23E-01 | 4.69E-01 | 4.69E-01 |
| + | NB-94 | 702.63 | 100.00 | 2.57E-02 | 5.68E-02 | 6.42E-02 |
| | | 871.10 | 100.00 | 1.44E-02 | | 5.68E-02 |
| + | NB-95 | 765.79 | 99.81 | 8.93E-02 | 4.42E-01 | 4.42E-01 |
| + | NB-95M | 235.69 | 25.00 | -2.46E+08 | 4.28E+07 | 4.28E+07 |
| + | ZR-95 | 724.18 | 43.70 | 1.98E-02 | 3.51E-01 | 4.42E-01 |
| | | 756.72 | 55.30 | 2.59E-01 | | 3.51E-01 |
| + | MO-99 | 181.06 | 6.20 | 1.46E+10 | 3.06E+10 | 5.38E+10 |
| | | 739.58 | 12.80 | 1.79E+09 | | 3.06E+10 |
| | | 778.00 | 4.50 | -8.52E+09 | | 8.99E+10 |
| + | RU-103 | 497.08 | 89.00 | -4.46E-02 | 2.94E-01 | 2.94E-01 |
| + | RU-106 | 621.84 | 9.80 | 7.46E-02 | 6.54E-01 | 6.54E-01 |
| + | AG-108M | 433.93 | 89.90 | -1.90E-02 | 5.64E-02 | 5.64E-02 |
| | | 614.37 | 90.40 | 3.82E-03 | | 6.99E-02 |
| | | 722.95 | 90.50 | 7.28E-03 | | 6.85E-02 |
| + | CD-109 | 88.03 | 3.72 | -4.04E-01 | 1.80E+00 | -1.80E+00 |
| + | AG-110M | 657.75 | 93.14 | 5.54E-03 | 9.85E-02 | 9.85E-02 |
| | | 677.61 | 10.53 | -1.50E-02 | | 7.10E-01 |
| | | 706.67 | 16.46 | 4.44E-03 | | 4.56E-01 |
| | | 763.93 | 21.98 | -2.99E-02 | | 3.25E-01 |
| | | 884.67 | 71.63 | 1.79E-02 | | 1.05E-01 |
| | | 1384.27 | 23.94 | 1.50E-01 | | 3.23E-01 |
| + | CD-113M | 263.70 | 0.02 | -2.07E+01 | 2.12E+02 | 2.12E+02 |
| + | SN-113 | 255.12 | 1.93 | -1.62E-01 | 1.39E-01 | 4.12E+00 |
| | | 391.69 | 64.90 | -3.05E-02 | | 1.39E-01 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | TE123M | 159.00 | | 84.10 | 8.32E-03 | 9.03E-02 | 9.03E-02 |
| + | SB-124 | 602.71 | | 97.87 | -2.53E-02 | 1.80E-01 | 1.80E-01 |
| | | 645.85 | | 7.26 | -1.06E+00 | | 2.29E+00 |
| | | 722.78 | | 11.10 | 1.86E-01 | | 1.75E+00 |
| | | 1691.02 | | 49.00 | -9.80E-02 | | 2.60E-01 |
| + | I-125 | 35.49 | | 6.49 | -1.00E+00 | 2.18E+00 | 2.18E+00 |
| + | SB-125 | 176.33 | | 6.89 | -4.84E-01 | 1.85E-01 | 6.41E-01 |
| | | 427.89 | | 29.33 | 1.89E-02 | | 1.85E-01 |
| | | 463.38 | | 10.35 | 3.86E-01 | | 6.19E-01 |
| | | 600.56 | | 17.80 | -1.26E-01 | | 3.20E-01 |
| | | 635.90 | | 11.32 | 1.16E-01 | | 5.17E-01 |
| + | SB-126 | 414.70 | | 83.30 | -2.12E+00 | 1.56E+01 | 1.59E+01 |
| | | 666.33 | | 99.60 | 5.33E+00 | | 1.74E+01 |
| | | 695.00 | | 99.60 | -5.86E+00 | | 1.56E+01 |
| | | 720.50 | | 53.80 | 2.90E+00 | | 2.73E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 4.89E-01 | 2.88E-01 | 2.88E-01 |
| + | SB-127 | 473.00 | | 25.00 | -4.76E+05 | 9.48E+06 | 1.16E+07 |
| | | 685.20 | | 35.70 | -2.99E+06 | | 9.48E+06 |
| | | 783.80 | | 14.70 | 8.73E+06 | | 2.29E+07 |
| + | I-129 | 29.78 | | 57.00 | -3.44E-02 | 8.93E-02 | 8.93E-02 |
| | | 33.60 | | 13.20 | -2.43E-01 | | 3.43E-01 |
| | | 39.58 | | 7.52 | 7.52E-02 | | 6.07E-01 |
| + | I-131 | 284.30 | | 6.05 | -5.12E+02 | 2.97E+02 | 4.37E+03 |
| | | 364.48 | | 81.20 | -9.68E+01 | | 2.97E+02 |
| | | 636.97 | | 7.26 | 4.32E+02 | | 4.00E+03 |
| | | 722.89 | | 1.80 | 1.90E+03 | | 1.79E+04 |
| + | TE-132 | 49.72 | | 13.10 | -6.08E+08 | 7.36E+07 | 5.02E+08 |
| | | 228.16 | | 88.00 | -4.28E+06 | | 7.36E+07 |
| + | BA-133 | 81.00 | | 33.00 | -5.22E-01 | 1.11E-01 | 1.50E-01 |
| | | 302.84 | | 17.80 | -2.27E-02 | | 2.96E-01 |
| | | 356.01 | | 60.00 | 5.19E-04 | | 1.11E-01 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -2.22E+05 | 6.37E+04 | 6.37E+04 |
| + | CS-134 | 563.23 | | 8.38 | -8.11E-03 | 7.23E-02 | 7.45E-01 |
| | | 569.32 | | 15.43 | 4.18E-02 | | 3.72E-01 |
| | | 604.70 | | 97.60 | -7.86E-03 | | 7.23E-02 |
| | | 795.84 | | 85.40 | 6.00E-02 | | 8.38E-02 |
| | | 801.93 | | 8.73 | 2.90E-01 | | 7.51E-01 |
| + | CS-135 | 268.24 | | 16.00 | 2.69E-01 | 3.49E-01 | 3.49E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | 3.71E+01 | 1.08E+01 | 1.08E+02 |
| | | 163.89 | | 4.61 | -2.72E+01 | | 1.71E+02 |
| | | 176.55 | | 13.56 | -4.28E+01 | | 5.67E+01 |
| | | 273.65 | | 12.66 | -1.69E+01 | | 8.02E+01 |
| | | 340.57 | | 48.50 | 4.87E+01 | | 2.54E+01 |
| | | 818.50 | | 99.70 | -2.93E+00 | | 1.08E+01 |
| | | 1048.07 | | 79.60 | -2.77E-02 | | 1.45E+01 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | CS-136 | 1235.34 | | 19.70 | 2.04E+01 | 1.08E+01 | 8.20E+01 |
| + | CS-137 | 661.65 | * | 85.12 | 1.38E-01 | 9.44E-02 | 9.44E-02 |
| + | LA-138 | 788.74 | | 34.00 | -1.56E-03 | 7.38E-02 | 1.54E-01 |
| | | 1435.80 | | 66.00 | -2.56E-03 | | 7.38E-02 |
| + | CE-139 | 165.85 | | 80.35 | 8.95E-03 | 8.89E-02 | 8.89E-02 |
| + | BA-140 | 162.64 | | 6.70 | -3.28E+01 | 4.10E+01 | 1.38E+02 |
| | | 304.84 | | 4.50 | -5.66E+00 | | 2.18E+02 |
| | | 423.70 | | 3.20 | 6.75E+01 | | 3.50E+02 |
| | | 437.55 | | 2.00 | 3.23E+02 | | 5.80E+02 |
| | | 537.32 | | 25.00 | -8.54E+00 | | 4.10E+01 |
| + | LA-140 | 328.77 | | 20.50 | 3.81E+01 | 1.38E+01 | 5.92E+01 |
| | | 487.03 | | 45.50 | 2.61E+00 | | 2.21E+01 |
| | | 815.85 | | 23.50 | 1.22E-01 | | 5.29E+01 |
| | | 1596.49 | | 95.49 | 1.97E+00 | | 1.38E+01 |
| + | CE-141 | 145.44 | | 48.40 | -1.43E-01 | 7.40E-01 | 7.40E-01 |
| + | @ CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | CE-144 | 133.54 | | 10.80 | -1.47E-01 | 4.83E-01 | 4.83E-01 |
| + | PM-144 | 476.78 | | 42.00 | 8.00E-02 | 6.70E-02 | 1.54E-01 |
| | | 618.01 | | 98.60 | -7.10E-03 | | 6.70E-02 |
| | | 696.49 | | 99.49 | -3.46E-02 | | 7.09E-02 |
| + | PM-145 | 36.85 | | 21.70 | -1.24E-01 | 1.17E-01 | 2.08E-01 |
| | | 37.36 | | 39.70 | -1.73E-02 | | 1.17E-01 |
| | | 42.30 | | 15.10 | -4.50E-01 | | 2.84E-01 |
| | | 72.40 | | 2.31 | -2.97E+00 | | 2.66E+00 |
| + | PM-146 | 453.90 | | 39.94 | -5.10E-02 | 1.31E-01 | 1.31E-01 |
| | | 735.90 | | 14.01 | 2.08E-01 | | 4.34E-01 |
| | | 747.13 | | 13.10 | -1.39E-01 | | 4.15E-01 |
| + | ND-147 | 91.11 | | 28.90 | 1.93E+02 | 1.10E+02 | 1.10E+02 |
| | | 531.02 | | 13.10 | 6.34E+01 | | 2.01E+02 |
| + | PM-149 | 285.90 | | 3.10 | 6.23E+12 | 5.32E+13 | 5.32E+13 |
| + | EU-152 | 121.78 | | 20.50 | 1.60E-02 | 2.02E-01 | 2.02E-01 |
| | | 244.69 | | 5.40 | -4.99E-03 | | 9.05E-01 |
| | | 344.27 | | 19.13 | -2.25E-02 | | 2.70E-01 |
| | | 778.89 | | 9.20 | -7.30E-02 | | 6.02E-01 |
| | | 964.01 | | 10.40 | -1.07E+00 | | 8.13E-01 |
| | | 1085.78 | | 7.22 | 1.64E-01 | | 9.48E-01 |
| | | 1112.02 | | 9.60 | 5.55E-01 | | 7.71E-01 |
| | | 1407.95 | | 14.94 | -1.88E-01 | | 3.70E-01 |
| + | GD-153 | 97.43 | | 31.30 | 2.99E-02 | 1.81E-01 | 1.81E-01 |
| | | 103.18 | | 22.20 | -1.26E-01 | | 2.54E-01 |
| + | EU-154 | 123.07 | | 40.50 | -4.50E-02 | 1.05E-01 | 1.05E-01 |
| | | 723.30 | | 19.70 | 3.41E-02 | | 3.21E-01 |
| | | 873.19 | | 11.50 | 1.99E-01 | | 5.13E-01 |
| | | 996.32 | | 10.30 | -4.44E-01 | | 5.64E-01 |
| | | 1004.76 | | 17.90 | -1.72E-01 | | 3.61E-01 |
| | | 1274.45 | | 35.50 | 2.02E-02 | | 1.98E-01 |
| + | EU-155 | 86.50 | * | 30.90 | 6.08E-01 | 2.13E-01 | 3.58E-01 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | EU-155 | 105.30 | | 20.70 | 1.94E-02 | 2.13E-01 | 2.13E-01 |
| + | EU-156 | 811.77 | | 10.40 | 3.55E+00 | 4.95E+01 | 4.95E+01 |
| | | 1153.47 | | 7.20 | -6.00E+01 | | 9.01E+01 |
| | | 1230.71 | | 8.90 | 4.62E+00 | | 7.58E+01 |
| + | HO-166M | 184.41 | | 72.60 | 1.29E-01 | 7.57E-02 | 7.57E-02 |
| | | 280.45 | | 29.60 | 1.13E-01 | | 1.82E-01 |
| | | 410.94 | | 11.10 | 1.32E-01 | | 4.94E-01 |
| | | 711.69 | | 54.10 | 4.40E-02 | | 1.09E-01 |
| + | TM-171 | 66.72 | | 0.14 | 5.99E+00 | 4.09E+01 | 4.09E+01 |
| + | HF-172 | 67.35 | | 5.31 | 7.15E-02 | 4.28E-01 | 1.06E+00 |
| | | 125.81 | | 11.30 | -3.16E-02 | | 4.28E-01 |
| + | LU-172 | 181.53 | | 20.60 | 1.74E+03 | 2.89E+03 | 6.43E+03 |
| | | 900.72 | | 29.81 | -2.38E+03 | | 5.57E+03 |
| | | 1093.66 | | 62.50 | -7.16E+02 | | 2.89E+03 |
| + | LU-173 | 100.72 | | 5.24 | 7.13E-01 | 3.03E-01 | 9.80E-01 |
| | | 272.11 | | 21.20 | -1.29E-03 | | 3.03E-01 |
| + | HF-175 | 343.40 | | 84.00 | -1.35E-02 | 1.65E-01 | 1.65E-01 |
| + | LU-176 | 88.34 | | 13.30 | -9.74E-02 | 4.93E-02 | 4.35E-01 |
| | | 201.83 | | 86.00 | -2.09E-02 | | 4.93E-02 |
| | | 306.78 | | 94.00 | -7.17E-03 | | 4.97E-02 |
| + | HF-181 | 133.02 | | 41.70 | -1.52E-01 | 3.10E-01 | 4.97E-01 |
| | | 345.85 | | 17.20 | -1.25E-01 | | 1.46E+00 |
| | | 482.03 | | 82.80 | -2.42E-02 | | 3.10E-01 |
| + | TA-182 | 67.75 | | 41.20 | 1.52E-02 | 2.26E-01 | 2.26E-01 |
| | | 1121.30 | | 34.90 | 9.91E-01 | | 5.74E-01 |
| | | 1189.05 | | 16.23 | -1.54E-01 | | 8.97E-01 |
| | | 1221.41 | | 26.98 | 3.53E-01 | | 6.02E-01 |
| | | 1231.02 | | 11.44 | 7.07E-02 | | 1.16E+00 |
| + | IR-192 | 308.46 | | 29.68 | 1.46E-01 | 2.58E-01 | 4.13E-01 |
| | | 468.07 | | 48.10 | -4.14E-02 | | 2.58E-01 |
| + | HG-203 | 279.19 | | 77.30 | 2.05E-01 | 3.06E-01 | 3.06E-01 |
| + | TL-204 | 374.74 | | 94.11 | -2.07E-02 | 5.16E-02 | 5.16E-02 |
| | | 899.15 | | 99.16 | -6.34E-03 | | 6.11E-02 |
| | | 911.74 | | 91.10 | 3.72E-01 | | 1.38E-01 |
| + | BI-207 | 569.67 | | 97.72 | 8.21E-03 | 5.42E-02 | 5.42E-02 |
| | | 1063.62 | | 74.90 | -8.14E-03 | | 8.48E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 1.14E+00 | 1.37E-01 | 3.03E-01 |
| | | 860.37 | * | 4.48 | 1.39E+00 | | 2.00E+00 |
| | | 2614.66 | * | 35.85 | 8.27E-01 | | 1.37E-01 |
| + | BI-210M | 262.00 | | 45.00 | 2.92E-02 | 1.13E-01 | 1.13E-01 |
| | | 300.00 | | 23.00 | -7.79E-01 | | 2.45E-01 |
| + | PB-210 | 46.50 | | 4.25 | 1.23E+00 | 1.14E+00 | 1.14E+00 |
| + | PB-211 | 404.84 | | 2.90 | -4.50E-01 | 1.88E+00 | 1.88E+00 |
| | | 831.96 | | 2.90 | -4.20E-01 | | 2.00E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 5.54E-01 | 6.76E-01 | 6.76E-01 |
| | | 1620.62 | | 2.75 | 5.68E-01 | | 2.02E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.20E+00 | 2.51E-01 | 2.51E-01 |
| | | 300.09 | * | 3.41 | 1.73E+00 | | 2.26E+00 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BI-214 | 609.31 | * | 46.30 | 8.52E-01 | 2.02E-01 | 2.02E-01 |
| | | 1120.29 | * | 15.10 | 1.23E+00 | | 7.69E-01 |
| | | 1764.49 | * | 15.80 | 1.16E+00 | | 3.10E-01 |
| | | 2204.22 | * | 4.98 | 1.46E+00 | | 1.08E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 1.16E+00 | 2.17E-01 | 3.98E-01 |
| | | 351.92 | * | 37.19 | 9.18E-01 | | 2.17E-01 |
| + | RN-219 | 401.80 | | 6.50 | -1.62E-01 | 8.05E-01 | 8.05E-01 |
| + | RA-223 | 323.87 | | 3.88 | -1.97E-01 | 1.33E+00 | 1.33E+00 |
| + | RA-224 | 240.98 | * | 3.95 | 3.15E+00 | 2.85E+00 | 2.85E+00 |
| + | RA-225 | 40.00 | | 31.00 | 9.20E+00 | 1.53E+01 | 1.53E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.84E+00 | 2.13E+00 | 2.13E+00 |
| + | TH-227 | 50.10 | | 8.40 | -3.61E-01 | 4.94E-01 | 5.26E-01 |
| | | 236.00 | | 11.50 | -2.84E+00 | | 4.94E-01 |
| | | 256.20 | | 6.30 | 3.08E-01 | | 8.24E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.14E+00 | 4.22E-01 | 6.60E-01 |
| | | 911.07 | * | 27.70 | 9.84E-01 | | 4.22E-01 |
| | | 969.11 | * | 16.60 | 1.34E+00 | | 4.37E-01 |
| + | TH-230 | 48.44 | | 16.90 | 1.10E-01 | 2.82E-01 | 2.82E-01 |
| | | 62.85 | | 4.60 | 2.11E+00 | | 1.25E+00 |
| | | 67.67 | | 0.37 | 9.27E-01 | | 1.38E+01 |
| + | PA-231 | 283.67 | | 1.60 | 9.82E-01 | 2.25E+00 | 3.27E+00 |
| | | 302.67 | | 2.30 | -1.72E-01 | | 2.25E+00 |
| + | TH-231 | 25.64 | | 14.70 | -2.68E+00 | 4.61E-01 | 4.61E-01 |
| | | 84.21 | | 6.40 | -3.26E-01 | | 8.16E-01 |
| + | PA-233 | 311.98 | | 38.60 | 8.73E-02 | 1.59E+00 | 1.59E+00 |
| + | PA-234 | 131.20 | | 20.40 | -4.66E-02 | 2.08E-01 | 2.08E-01 |
| | | 733.99 | | 8.80 | 2.88E-01 | | 6.71E-01 |
| | | 946.00 | | 12.00 | 2.02E-02 | | 4.37E-01 |
| + | PA-234M | 1001.03 | | 0.92 | -1.77E+00 | 6.56E+00 | 6.56E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 2.04E+00 | 2.37E+00 | 2.37E+00 |
| + | U-235 | 143.76 | | 10.50 | 3.50E-01 | 4.33E-01 | 4.33E-01 |
| | | 163.35 | | 4.70 | -1.43E-01 | | 9.01E-01 |
| | | 205.31 | | 4.70 | -1.40E+00 | | 9.51E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 1.44E+00 | 8.45E-01 | 8.45E-01 |
| + | NP-239 | 106.10 | | 22.70 | 1.23E+11 | 9.14E+11 | 9.14E+11 |
| | | 228.18 | | 10.70 | -1.16E+11 | | 1.99E+12 |
| | | 277.60 | | 14.10 | 1.73E+11 | | 1.78E+12 |
| + | AM-241 | 59.54 | | 35.90 | -2.80E-02 | 1.39E-01 | 1.39E-01 |
| + | AM-243 | 74.67 | * | 66.00 | 2.47E-01 | 1.62E-01 | 1.62E-01 |
| + | CM-243 | 209.75 | | 3.29 | 1.10E+00 | 3.73E-01 | 1.51E+00 |
| | | 228.14 | | 10.60 | -2.42E-02 | | 4.17E-01 |
| | | 277.60 | | 14.00 | 3.62E-02 | | 3.73E-01 |

Analysis Report for 1707087-12

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+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.84E+00 | 1.84E+00 | 3.81E-01 | 8.74E-01 |
| | NA-22 | 1274.54 | | 99.94 | 7.41E-02 | 7.41E-02 | 7.54E-03 | 3.42E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 3.85E-02 | 3.85E-02 | 1.03E-02 | 1.58E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 9.37E-01 | 9.37E-01 | 2.03E+01 | 4.41E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 5.41E-02 | 5.41E-02 | 3.64E-03 | 2.65E-02 |
| | | 78.34 | | 96.00 | 6.97E-02 | | 1.49E-01 | 3.43E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.31E-01 | 1.31E-01 | 4.95E-02 | 6.08E-02 |
| | | 1120.51 | | 99.99 | 2.48E-01 | | 3.95E-01 | 1.18E-01 |
| | V-48 | 983.52 | | 99.98 | 4.50E+00 | 4.43E+00 | -2.44E-01 | 2.09E+00 |
| | | 1312.10 | | 97.50 | 4.43E+00 | | -2.21E+00 | 2.01E+00 |
| | CR-51 | 320.08 | | 9.83 | 6.09E+00 | 6.09E+00 | 2.59E-01 | 2.93E+00 |
| | MN-54 | 834.83 | | 99.97 | 7.39E-02 | 7.39E-02 | -2.10E-02 | 3.45E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.45E-01 | 1.45E-01 | 4.21E-02 | 6.75E-02 |
| | | 1037.75 | | 14.03 | 9.60E-01 | | -3.07E-01 | 4.40E-01 |
| | | 1238.25 | | 67.00 | 3.35E-01 | | 2.68E-01 | 1.58E-01 |
| | | 1771.40 | | 15.51 | 6.18E-01 | | -3.89E-02 | 2.56E-01 |
| | | 2598.48 | | 16.90 | 7.45E-01 | | 2.64E-02 | 3.09E-01 |
| | CO-57 | 122.06 | | 85.51 | 6.23E-02 | 6.23E-02 | 5.80E-03 | 3.03E-02 |
| | | 136.48 | | 10.60 | 5.13E-01 | | 1.63E-01 | 2.49E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.49E-01 | 1.49E-01 | 8.16E-03 | 6.92E-02 |
| | FE-59 | 1099.22 | | 56.50 | 5.59E-01 | 5.59E-01 | -1.96E-01 | 2.59E-01 |
| | | 1291.56 | | 43.20 | 6.66E-01 | | -1.20E-01 | 3.03E-01 |
| | CO-60 | 1173.22 | | 100.00 | 7.29E-02 | 5.63E-02 | -3.68E-02 | 3.38E-02 |
| | | 1332.49 | | 100.00 | 5.63E-02 | | 6.43E-03 | 2.53E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 1.80E-01 | 1.80E-01 | 7.28E-03 | 8.35E-02 |
| | GA-67 | 93.31 | | 35.70 | 2.33E+08 | 2.33E+08 | 5.14E+08 | 1.14E+08 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| GA-67 | 208.95 | 2.24 | 3.30E+09 | 2.33E+08 | 4.22E+09 | 1.60E+09 |
| | 300.22 | 16.00 | 4.98E+08 | | -6.30E+08 | 2.41E+08 |
| SE-75 | 121.11 | 16.70 | 4.33E-01 | 1.26E-01 | 3.44E-02 | 2.11E-01 |
| | 136.00 | 59.20 | 1.26E-01 | | 4.02E-02 | 6.14E-02 |
| | 264.65 | 59.80 | 1.45E-01 | | 1.52E-02 | 6.99E-02 |
| | 279.53 | 25.20 | 3.81E-01 | | 2.55E-01 | 1.84E-01 |
| | 400.65 | 11.40 | 8.30E-01 | | 3.25E-01 | 3.97E-01 |
| RB-82 | 776.52 | 13.00 | 6.59E+00 | 6.59E+00 | 8.89E-01 | 3.08E+00 |
| RB-83 | 520.41 | 46.00 | 2.46E-01 | 2.46E-01 | 7.47E-03 | 1.16E-01 |
| | 529.64 | 30.30 | 3.70E-01 | | 6.92E-02 | 1.75E-01 |
| | 552.65 | 16.40 | 7.70E-01 | | 3.25E-01 | 3.66E-01 |
| KR-85 | 513.99 | 0.43 | 1.79E+01 | 1.79E+01 | 2.30E+01 | 8.65E+00 |
| SR-85 | 513.99 | 99.27 | 2.22E-01 | 2.22E-01 | 2.85E-01 | 1.07E-01 |
| Y-88 | 898.02 | 93.40 | 1.14E-01 | 5.96E-02 | 9.16E-03 | 5.26E-02 |
| | 1836.01 | 99.38 | 5.96E-02 | | 0.00E+00 | 2.31E-02 |
| MO-93 | 263.06 | 56.72 | 8.96E-02 | 4.43E-02 | 1.48E-03 | 4.33E-02 |
| | 684.67 | 99.68 | 6.00E-02 | | -1.89E-02 | 2.83E-02 |
| | 1477.11 | 99.08 | 4.43E-02 | | -2.05E-02 | 1.91E-02 |
| NB-93M | 16.57 | 9.43 | 4.69E-01 | 4.69E-01 | -1.23E-01 | 2.20E-01 |
| NB-94 | 702.63 | 100.00 | 6.42E-02 | 5.68E-02 | 2.57E-02 | 3.04E-02 |
| | 871.10 | 100.00 | 5.68E-02 | | 1.44E-02 | 2.64E-02 |
| NB-95 | 765.79 | 99.81 | 4.42E-01 | 4.42E-01 | 8.93E-02 | 2.08E-01 |
| NB-95M | 235.69 | 25.00 | 4.28E+07 | 4.28E+07 | -2.46E+08 | 2.08E+07 |
| ZR-95 | 724.18 | 43.70 | 4.42E-01 | 3.51E-01 | 1.98E-02 | 2.09E-01 |
| | 756.72 | 55.30 | 3.51E-01 | | 2.59E-01 | 1.66E-01 |
| MO-99 | 181.06 | 6.20 | 5.38E+10 | 3.06E+10 | 1.46E+10 | 2.61E+10 |
| | 739.58 | 12.80 | 3.06E+10 | | 1.79E+09 | 1.43E+10 |
| | 778.00 | 4.50 | 8.99E+10 | | -8.52E+09 | 4.19E+10 |
| RU-103 | 497.08 | 89.00 | 2.94E-01 | 2.94E-01 | -4.46E-02 | 1.38E-01 |
| RU-106 | 621.84 | 9.80 | 6.54E-01 | 6.54E-01 | 7.46E-02 | 3.08E-01 |
| AG-108M | 433.93 | 89.90 | 5.64E-02 | 5.64E-02 | -1.90E-02 | 2.69E-02 |
| | 614.37 | 90.40 | 6.99E-02 | | 3.82E-03 | 3.32E-02 |
| | 722.95 | 90.50 | 6.85E-02 | | 7.28E-03 | 3.23E-02 |
| CD-109 | 88.03 | 3.72 | 1.80E+00 | 1.80E+00 | -4.04E-01 | 8.85E-01 |
| AG-110M | 657.75 | 93.14 | 9.85E-02 | 9.85E-02 | 5.54E-03 | 4.70E-02 |
| | 677.61 | 10.53 | 7.10E-01 | | -1.50E-02 | 3.34E-01 |
| | 706.67 | 16.46 | 4.56E-01 | | 4.44E-03 | 2.14E-01 |
| | 763.93 | 21.98 | 3.25E-01 | | -2.99E-02 | 1.51E-01 |
| | 884.67 | 71.63 | 1.05E-01 | | 1.79E-02 | 4.86E-02 |
| | 1384.27 | 23.94 | 3.23E-01 | | 1.50E-01 | 1.46E-01 |
| CD-113M | 263.70 | 0.02 | 2.12E+02 | 2.12E+02 | -2.07E+01 | 1.02E+02 |
| SN-113 | 255.12 | 1.93 | 4.12E+00 | 1.39E-01 | -1.62E-01 | 1.98E+00 |
| | 391.69 | 64.90 | 1.39E-01 | | -3.05E-02 | 6.65E-02 |
| TE123M | 159.00 | 84.10 | 9.03E-02 | 9.03E-02 | 8.32E-03 | 4.38E-02 |
| SB-124 | 602.71 | 97.87 | 1.80E-01 | 1.80E-01 | -2.53E-02 | 8.52E-02 |
| | 645.85 | 7.26 | 2.29E+00 | | -1.06E+00 | 1.07E+00 |
| | 722.78 | 11.10 | 1.75E+00 | | 1.86E-01 | 8.25E-01 |
| | 1691.02 | 49.00 | 2.60E-01 | | -9.80E-02 | 1.09E-01 |
| I-125 | 35.49 | 6.49 | 2.18E+00 | 2.18E+00 | -1.00E+00 | 1.05E+00 |
| SB-125 | 176.33 | 6.89 | 6.41E-01 | 1.85E-01 | -4.84E-01 | 3.10E-01 |
| | 427.89 | 29.33 | 1.85E-01 | | 1.89E-02 | 8.83E-02 |
| | 463.38 | 10.35 | 6.19E-01 | | 3.86E-01 | 2.97E-01 |
| | 600.56 | 17.80 | 3.20E-01 | | -1.26E-01 | 1.51E-01 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | SB-125 | 635.90 | | 11.32 | 5.17E-01 | 1.85E-01 | 1.16E-01 | 2.43E-01 |
| | SB-126 | 414.70 | | 83.30 | 1.59E+01 | 1.56E+01 | -2.12E+00 | 7.58E+00 |
| | | 666.33 | | 99.60 | 1.74E+01 | | 5.33E+00 | 8.26E+00 |
| | | 695.00 | | 99.60 | 1.56E+01 | | -5.86E+00 | 7.34E+00 |
| | | 720.50 | | 53.80 | 2.73E+01 | | 2.90E+00 | 1.28E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 2.88E-01 | 2.88E-01 | 4.89E-01 | 1.42E-01 |
| | SB-127 | 473.00 | | 25.00 | 1.16E+07 | 9.48E+06 | -4.76E+05 | 5.52E+06 |
| | | 685.20 | | 35.70 | 9.48E+06 | | -2.99E+06 | 4.47E+06 |
| | | 783.80 | | 14.70 | 2.29E+07 | | 8.73E+06 | 1.07E+07 |
| | I-129 | 29.78 | | 57.00 | 8.93E-02 | 8.93E-02 | -3.44E-02 | 4.33E-02 |
| | | 33.60 | | 13.20 | 3.43E-01 | | -2.43E-01 | 1.66E-01 |
| | | 39.58 | | 7.52 | 6.07E-01 | | 7.52E-02 | 2.95E-01 |
| | I-131 | 284.30 | | 6.05 | 4.37E+03 | 2.97E+02 | -5.12E+02 | 2.11E+03 |
| | | 364.48 | | 81.20 | 2.97E+02 | | -9.68E+01 | 1.42E+02 |
| | | 636.97 | | 7.26 | 4.00E+03 | | 4.32E+02 | 1.89E+03 |
| | | 722.89 | | 1.80 | 1.79E+04 | | 1.90E+03 | 8.43E+03 |
| | TE-132 | 49.72 | | 13.10 | 5.02E+08 | 7.36E+07 | -6.08E+08 | 2.44E+08 |
| | | 228.16 | | 88.00 | 7.36E+07 | | -4.28E+06 | 3.55E+07 |
| | BA-133 | 81.00 | | 33.00 | 1.50E-01 | 1.11E-01 | -5.22E-01 | 7.31E-02 |
| | | 302.84 | | 17.80 | 2.96E-01 | | -2.27E-02 | 1.43E-01 |
| | | 356.01 | | 60.00 | 1.11E-01 | | 5.19E-04 | 5.35E-02 |
| @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | XE-133 | 81.00 | | 38.00 | 6.37E+04 | 6.37E+04 | -2.22E+05 | 3.11E+04 |
| | CS-134 | 563.23 | | 8.38 | 7.45E-01 | 7.23E-02 | -8.11E-03 | 3.54E-01 |
| | | 569.32 | | 15.43 | 3.72E-01 | | 4.18E-02 | 1.75E-01 |
| | | 604.70 | | 97.60 | 7.23E-02 | | -7.86E-03 | 3.44E-02 |
| | | 795.84 | | 85.40 | 8.38E-02 | | 6.00E-02 | 3.94E-02 |
| | | 801.93 | | 8.73 | 7.51E-01 | | 2.90E-01 | 3.51E-01 |
| | CS-135 | 268.24 | | 16.00 | 3.49E-01 | 3.49E-01 | 2.69E-01 | 1.69E-01 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CS-136 | 153.22 | | 7.46 | 1.08E+02 | 1.08E+01 | 3.71E+01 | 5.24E+01 |
| | | 163.89 | | 4.61 | 1.71E+02 | | -2.72E+01 | 8.31E+01 |
| | | 176.55 | | 13.56 | 5.67E+01 | | -4.28E+01 | 2.75E+01 |
| | | 273.65 | | 12.66 | 8.02E+01 | | -1.69E+01 | 3.88E+01 |
| | | 340.57 | | 48.50 | 2.54E+01 | | 4.87E+01 | 1.23E+01 |
| | | 818.50 | | 99.70 | 1.08E+01 | | -2.93E+00 | 5.02E+00 |
| | | 1048.07 | | 79.60 | 1.45E+01 | | -2.77E-02 | 6.70E+00 |
| | | 1235.34 | | 19.70 | 8.20E+01 | | 2.04E+01 | 3.85E+01 |
| + | CS-137 | 661.65 | * | 85.12 | 9.44E-02 | 9.44E-02 | 1.38E-01 | 4.52E-02 |
| | LA-138 | 788.74 | | 34.00 | 1.54E-01 | 7.38E-02 | -1.56E-03 | 7.12E-02 |
| | | 1435.80 | | 66.00 | 7.38E-02 | | -2.56E-03 | 3.25E-02 |
| | CE-139 | 165.85 | | 80.35 | 8.89E-02 | 8.89E-02 | 8.95E-03 | 4.31E-02 |
| | BA-140 | 162.64 | | 6.70 | 1.38E+02 | 4.10E+01 | -3.28E+01 | 6.69E+01 |
| | | 304.84 | | 4.50 | 2.18E+02 | | -5.66E+00 | 1.05E+02 |
| | | 423.70 | | 3.20 | 3.50E+02 | | 6.75E+01 | 1.67E+02 |
| | | 437.55 | | 2.00 | 5.80E+02 | | 3.23E+02 | 2.77E+02 |
| | | 537.32 | | 25.00 | 4.10E+01 | | -8.54E+00 | 1.93E+01 |
| | LA-140 | 328.77 | | 20.50 | 5.92E+01 | 1.38E+01 | 3.81E+01 | 2.86E+01 |
| | | 487.03 | | 45.50 | 2.21E+01 | | 2.61E+00 | 1.04E+01 |
| | | 815.85 | | 23.50 | 5.29E+01 | | 1.22E-01 | 2.47E+01 |
| | | 1596.49 | | 95.49 | 1.38E+01 | | 1.97E+00 | 6.18E+00 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | CE-141 | 145.44 | | 48.40 | 7.40E-01 | 7.40E-01 | -1.43E-01 | 3.59E-01 |
| @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-144 | 133.54 | | 10.80 | 4.83E-01 | 4.83E-01 | -1.47E-01 | 2.34E-01 |
| | PM-144 | 476.78 | | 42.00 | 1.54E-01 | 6.70E-02 | 8.00E-02 | 7.31E-02 |
| | | 618.01 | | 98.60 | 6.70E-02 | | -7.10E-03 | 3.16E-02 |
| | | 696.49 | | 99.49 | 7.09E-02 | | -3.46E-02 | 3.33E-02 |
| | PM-145 | 36.85 | | 21.70 | 2.08E-01 | 1.17E-01 | -1.24E-01 | 1.01E-01 |
| | | 37.36 | | 39.70 | 1.17E-01 | | -1.73E-02 | 5.68E-02 |
| | | 42.30 | | 15.10 | 2.84E-01 | | -4.50E-01 | 1.38E-01 |
| | | 72.40 | | 2.31 | 2.66E+00 | | -2.97E+00 | 1.31E+00 |
| | PM-146 | 453.90 | | 39.94 | 1.31E-01 | 1.31E-01 | -5.10E-02 | 6.22E-02 |
| | | 735.90 | | 14.01 | 4.34E-01 | | 2.08E-01 | 2.04E-01 |
| | | 747.13 | | 13.10 | 4.15E-01 | | -1.39E-01 | 1.93E-01 |
| | ND-147 | 91.11 | | 28.90 | 1.10E+02 | 1.10E+02 | 1.93E+02 | 5.42E+01 |
| | | 531.02 | | 13.10 | 2.01E+02 | | 6.34E+01 | 9.50E+01 |
| | PM-149 | 285.90 | | 3.10 | 5.32E+13 | 5.32E+13 | 6.23E+12 | 2.57E+13 |
| | EU-152 | 121.78 | | 20.50 | 2.02E-01 | 2.02E-01 | 1.60E-02 | 9.81E-02 |
| | | 244.69 | | 5.40 | 9.05E-01 | | -4.99E-03 | 4.38E-01 |
| | | 344.27 | | 19.13 | 2.70E-01 | | -2.25E-02 | 1.30E-01 |
| | | 778.89 | | 9.20 | 6.02E-01 | | -7.30E-02 | 2.81E-01 |
| | | 964.01 | | 10.40 | 8.13E-01 | | -1.07E+00 | 3.85E-01 |
| | | 1085.78 | | 7.22 | 9.48E-01 | | 1.64E-01 | 4.40E-01 |
| | | 1112.02 | | 9.60 | 7.71E-01 | | 5.55E-01 | 3.60E-01 |
| | | 1407.95 | | 14.94 | 3.70E-01 | | -1.88E-01 | 1.65E-01 |
| | GD-153 | 97.43 | | 31.30 | 1.81E-01 | 1.81E-01 | 2.99E-02 | 8.82E-02 |
| | | 103.18 | | 22.20 | 2.54E-01 | | -1.26E-01 | 1.24E-01 |
| | EU-154 | 123.07 | | 40.50 | 1.05E-01 | 1.05E-01 | -4.50E-02 | 5.09E-02 |
| | | 723.30 | | 19.70 | 3.21E-01 | | 3.41E-02 | 1.52E-01 |
| | | 873.19 | | 11.50 | 5.13E-01 | | 1.99E-01 | 2.39E-01 |
| | | 996.32 | | 10.30 | 5.64E-01 | | -4.44E-01 | 2.60E-01 |
| | | 1004.76 | | 17.90 | 3.61E-01 | | -1.72E-01 | 1.67E-01 |
| | | 1274.45 | | 35.50 | 1.98E-01 | | 2.02E-02 | 9.14E-02 |
| + | EU-155 | 86.50 | * | 30.90 | 3.58E-01 | 2.13E-01 | 6.08E-01 | 1.77E-01 |
| | | 105.30 | | 20.70 | 2.13E-01 | | 1.94E-02 | 1.04E-01 |
| | EU-156 | 811.77 | | 10.40 | 4.95E+01 | 4.95E+01 | 3.55E+00 | 2.30E+01 |
| | | 1153.47 | | 7.20 | 9.01E+01 | | -6.00E+01 | 4.18E+01 |
| | | 1230.71 | | 8.90 | 7.58E+01 | | 4.62E+00 | 3.52E+01 |
| | HO-166M | 184.41 | | 72.60 | 7.57E-02 | 7.57E-02 | 1.29E-01 | 3.69E-02 |
| | | 280.45 | | 29.60 | 1.82E-01 | | 1.13E-01 | 8.79E-02 |
| | | 410.94 | | 11.10 | 4.94E-01 | | 1.32E-01 | 2.37E-01 |
| | | 711.69 | | 54.10 | 1.09E-01 | | 4.40E-02 | 5.13E-02 |
| | TM-171 | 66.72 | | 0.14 | 4.09E+01 | 4.09E+01 | 5.99E+00 | 2.00E+01 |
| | HF-172 | 67.35 | | 5.31 | 1.06E+00 | 4.28E-01 | 7.15E-02 | 5.20E-01 |
| | | 125.81 | | 11.30 | 4.28E-01 | | -3.16E-02 | 2.08E-01 |
| | LU-172 | 181.53 | | 20.60 | 6.43E+03 | 2.89E+03 | 1.74E+03 | 3.12E+03 |
| | | 900.72 | | 29.81 | 5.57E+03 | | -2.38E+03 | 2.59E+03 |
| | | 1093.66 | | 62.50 | 2.89E+03 | | -7.16E+02 | 1.33E+03 |
| | LU-173 | 100.72 | | 5.24 | 9.80E-01 | 3.03E-01 | 7.13E-01 | 4.78E-01 |
| | | 272.11 | | 21.20 | 3.03E-01 | | -1.29E-03 | 1.47E-01 |
| | HF-175 | 343.40 | | 84.00 | 1.65E-01 | 1.65E-01 | -1.35E-02 | 7.91E-02 |
| | LU-176 | 88.34 | | 13.30 | 4.35E-01 | 4.93E-02 | -9.74E-02 | 2.13E-01 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | LU-176 | 201.83 | | 86.00 | 4.93E-02 | 4.93E-02 | -2.09E-02 | 2.38E-02 |
| | | 306.78 | | 94.00 | 4.97E-02 | | -7.17E-03 | 2.39E-02 |
| | HF-181 | 133.02 | | 41.70 | 4.97E-01 | 3.10E-01 | -1.52E-01 | 2.41E-01 |
| | | 345.85 | | 17.20 | 1.46E+00 | | -1.25E-01 | 7.02E-01 |
| | | 482.03 | | 82.80 | 3.10E-01 | | -2.42E-02 | 1.47E-01 |
| | TA-182 | 67.75 | | 41.20 | 2.26E-01 | 2.26E-01 | 1.52E-02 | 1.10E-01 |
| | | 1121.30 | | 34.90 | 5.74E-01 | | 9.91E-01 | 2.74E-01 |
| | | 1189.05 | | 16.23 | 8.97E-01 | | -1.54E-01 | 4.20E-01 |
| | | 1221.41 | | 26.98 | 6.02E-01 | | 3.53E-01 | 2.83E-01 |
| | | 1231.02 | | 11.44 | 1.16E+00 | | 7.07E-02 | 5.39E-01 |
| | IR-192 | 308.46 | | 29.68 | 4.13E-01 | 2.58E-01 | 1.46E-01 | 1.98E-01 |
| | | 468.07 | | 48.10 | 2.58E-01 | | -4.14E-02 | 1.22E-01 |
| | HG-203 | 279.19 | | 77.30 | 3.06E-01 | 3.06E-01 | 2.05E-01 | 1.48E-01 |
| | TL-204 | 374.74 | | 94.11 | 5.16E-02 | 5.16E-02 | -2.07E-02 | 2.46E-02 |
| | | 899.15 | | 99.16 | 6.11E-02 | | -6.34E-03 | 2.84E-02 |
| | | 911.74 | | 91.10 | 1.38E-01 | | 3.72E-01 | 6.68E-02 |
| | BI-207 | 569.67 | | 97.72 | 5.42E-02 | 5.42E-02 | 8.21E-03 | 2.56E-02 |
| | | 1063.62 | | 74.90 | 8.48E-02 | | -8.14E-03 | 3.93E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 3.03E-01 | 1.37E-01 | 1.14E+00 | 1.47E-01 |
| | | 860.37 | * | 4.48 | 2.00E+00 | | 1.39E+00 | 9.55E-01 |
| | | 2614.66 | * | 35.85 | 1.37E-01 | | 8.27E-01 | 5.60E-02 |
| | BI-210M | 262.00 | | 45.00 | 1.13E-01 | 1.13E-01 | 2.92E-02 | 5.44E-02 |
| | | 300.00 | | 23.00 | 2.45E-01 | | -7.79E-01 | 1.19E-01 |
| | PB-210 | 46.50 | | 4.25 | 1.14E+00 | 1.14E+00 | 1.23E+00 | 5.54E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.88E+00 | 1.88E+00 | -4.50E-01 | 9.02E-01 |
| | | 831.96 | | 2.90 | 2.00E+00 | | -4.20E-01 | 9.30E-01 |
| + | BI-212 | 727.17 | * | 11.80 | 6.76E-01 | 6.76E-01 | 5.54E-01 | 3.23E-01 |
| | | 1620.62 | | 2.75 | 2.02E+00 | | 5.68E-01 | 8.95E-01 |
| + | PB-212 | 238.63 | * | 44.60 | 2.51E-01 | 2.51E-01 | 1.20E+00 | 1.24E-01 |
| | | 300.09 | * | 3.41 | 2.26E+00 | | 1.73E+00 | 1.10E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 2.02E-01 | 2.02E-01 | 8.52E-01 | 9.74E-02 |
| | | 1120.29 | * | 15.10 | 7.69E-01 | | 1.23E+00 | 3.68E-01 |
| | | 1764.49 | * | 15.80 | 3.10E-01 | | 1.16E+00 | 1.34E-01 |
| | | 2204.22 | * | 4.98 | 1.08E+00 | | 1.46E+00 | 4.61E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 3.98E-01 | 2.17E-01 | 1.16E+00 | 1.94E-01 |
| | | 351.92 | * | 37.19 | 2.17E-01 | | 9.18E-01 | 1.06E-01 |
| | RN-219 | 401.80 | | 6.50 | 8.05E-01 | 8.05E-01 | -1.62E-01 | 3.85E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.33E+00 | 1.33E+00 | -1.97E-01 | 6.39E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 2.85E+00 | 2.85E+00 | 3.15E+00 | 1.41E+00 |
| | RA-225 | 40.00 | | 31.00 | 1.53E+01 | 1.53E+01 | 9.20E+00 | 7.43E+00 |
| + | RA-226 | 186.21 | * | 3.28 | 2.13E+00 | 2.13E+00 | 1.84E+00 | 1.05E+00 |
| | TH-227 | 50.10 | | 8.40 | 5.26E-01 | 4.94E-01 | -3.61E-01 | 2.56E-01 |
| | | 236.00 | | 11.50 | 4.94E-01 | | -2.84E+00 | 2.40E-01 |
| | | 256.20 | | 6.30 | 8.24E-01 | | 3.08E-01 | 3.99E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 6.60E-01 | 4.22E-01 | 1.14E+00 | 3.21E-01 |
| | | 911.07 | * | 27.70 | 4.22E-01 | | 9.84E-01 | 2.03E-01 |
| | | 969.11 | * | 16.60 | 4.37E-01 | | 1.34E+00 | 2.05E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.82E-01 | 2.82E-01 | 1.10E-01 | 1.37E-01 |
| | | 62.85 | | 4.60 | 1.25E+00 | | 2.11E+00 | 6.15E-01 |
| | | 67.67 | | 0.37 | 1.38E+01 | | 9.27E-01 | 6.74E+00 |
| | PA-231 | 283.67 | | 1.60 | 3.27E+00 | 2.25E+00 | 9.82E-01 | 1.58E+00 |
| | | 302.67 | | 2.30 | 2.25E+00 | | -1.72E-01 | 1.08E+00 |
| | TH-231 | 25.64 | | 14.70 | 4.61E-01 | 4.61E-01 | -2.68E+00 | 2.24E-01 |

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TH-231 | 84.21 | | 6.40 | 8.16E-01 | 4.61E-01 | -3.26E-01 | 4.00E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.59E+00 | 1.59E+00 | 8.73E-02 | 7.64E-01 |
| | PA-234 | 131.20 | | 20.40 | 2.08E-01 | 2.08E-01 | -4.66E-02 | 1.01E-01 |
| | | 733.99 | | 8.80 | 6.71E-01 | | 2.88E-01 | 3.15E-01 |
| | | 946.00 | | 12.00 | 4.37E-01 | | 2.02E-02 | 2.01E-01 |
| | PA-234M | 1001.03 | | 0.92 | 6.56E+00 | 6.56E+00 | -1.77E+00 | 3.04E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 2.37E+00 | 2.37E+00 | 2.04E+00 | 1.17E+00 |
| | U-235 | 143.76 | | 10.50 | 4.33E-01 | 4.33E-01 | 3.50E-01 | 2.10E-01 |
| | | 163.35 | | 4.70 | 9.01E-01 | | -1.43E-01 | 4.37E-01 |
| | | 205.31 | | 4.70 | 9.51E-01 | | -1.40E+00 | 4.60E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 8.45E-01 | 8.45E-01 | 1.44E+00 | 4.18E-01 |
| | NP-239 | 106.10 | | 22.70 | 9.14E+11 | 9.14E+11 | 1.23E+11 | 4.45E+11 |
| | | 228.18 | | 10.70 | 1.99E+12 | | -1.16E+11 | 9.60E+11 |
| | | 277.60 | | 14.10 | 1.78E+12 | | 1.73E+11 | 8.62E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.39E-01 | 1.39E-01 | -2.80E-02 | 6.79E-02 |
| + | AM-243 | 74.67 | * | 66.00 | 1.62E-01 | 1.62E-01 | 2.47E-01 | 8.03E-02 |
| | CM-243 | 209.75 | | 3.29 | 1.51E+00 | 3.73E-01 | 1.10E+00 | 7.35E-01 |
| | | 228.14 | | 10.60 | 4.17E-01 | | -2.42E-02 | 2.01E-01 |
| | | 277.60 | | 14.00 | 3.73E-01 | | 3.62E-02 | 1.80E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

Analysis Report for 1707087-12

HTC-A03-S002-3036-02

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-3036-02

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 2 | 72 | 83 | 73 | 142 | 515 | 162 |
| 25: | 69 | 86 | 67 | 82 | 64 | 75 | 55 | 57 |
| 33: | 77 | 64 | 61 | 54 | 87 | 67 | 73 | 90 |
| 41: | 89 | 72 | 68 | 67 | 66 | 108 | 145 | 105 |
| 49: | 83 | 86 | 99 | 88 | 99 | 105 | 101 | 87 |
| 57: | 94 | 110 | 114 | 117 | 150 | 154 | 165 | 256 |
| 65: | 164 | 140 | 129 | 152 | 143 | 141 | 149 | 165 |
| 73: | 162 | 187 | 360 | 331 | 351 | 448 | 171 | 141 |
| 81: | 135 | 116 | 108 | 149 | 167 | 137 | 193 | 223 |
| 89: | 156 | 179 | 173 | 154 | 277 | 228 | 140 | 96 |
| 97: | 85 | 85 | 98 | 120 | 120 | 76 | 115 | 87 |
| 105: | 99 | 93 | 95 | 92 | 93 | 84 | 87 | 79 |
| 113: | 103 | 76 | 95 | 89 | 83 | 72 | 73 | 74 |
| 121: | 89 | 77 | 77 | 83 | 84 | 90 | 85 | 109 |
| 129: | 110 | 95 | 86 | 83 | 76 | 73 | 73 | 74 |
| 137: | 82 | 87 | 81 | 67 | 78 | 95 | 99 | 91 |
| 145: | 78 | 81 | 75 | 70 | 74 | 74 | 70 | 77 |
| 153: | 72 | 81 | 89 | 61 | 73 | 63 | 78 | 83 |
| 161: | 76 | 60 | 60 | 85 | 69 | 70 | 70 | 62 |
| 169: | 85 | 65 | 71 | 48 | 74 | 67 | 61 | 61 |
| 177: | 63 | 64 | 54 | 78 | 72 | 76 | 75 | 67 |
| 185: | 89 | 165 | 126 | 63 | 59 | 64 | 58 | 77 |
| 193: | 67 | 73 | 50 | 50 | 56 | 53 | 66 | 54 |
| 201: | 54 | 58 | 56 | 55 | 56 | 72 | 58 | 62 |
| 209: | 105 | 105 | 59 | 34 | 58 | 56 | 58 | 65 |
| 217: | 56 | 57 | 53 | 59 | 49 | 51 | 61 | 67 |
| 225: | 59 | 48 | 51 | 50 | 38 | 67 | 51 | 50 |
| 233: | 41 | 38 | 45 | 60 | 72 | 205 | 557 | 240 |
| 241: | 118 | 136 | 107 | 58 | 34 | 45 | 42 | 50 |
| 249: | 36 | 37 | 33 | 43 | 42 | 38 | 40 | 45 |
| 257: | 43 | 55 | 41 | 52 | 33 | 44 | 45 | 46 |
| 265: | 29 | 31 | 31 | 38 | 45 | 67 | 73 | 58 |
| 273: | 41 | 41 | 35 | 24 | 46 | 58 | 36 | 38 |
| 281: | 44 | 44 | 38 | 41 | 38 | 33 | 41 | 26 |
| 289: | 46 | 28 | 33 | 25 | 40 | 44 | 162 | 168 |
| 297: | 46 | 43 | 42 | 56 | 65 | 27 | 22 | 29 |
| 305: | 25 | 24 | 28 | 31 | 35 | 25 | 35 | 32 |
| 313: | 29 | 23 | 25 | 35 | 21 | 29 | 35 | 34 |
| 321: | 31 | 35 | 28 | 32 | 28 | 40 | 29 | 57 |
| 329: | 44 | 38 | 20 | 32 | 26 | 34 | 29 | 23 |
| 337: | 34 | 75 | 99 | 38 | 31 | 43 | 37 | 24 |
| 345: | 18 | 29 | 25 | 24 | 31 | 39 | 88 | 298 |
| 353: | 144 | 32 | 24 | 35 | 24 | 31 | 26 | 29 |
| 361: | 22 | 22 | 27 | 15 | 20 | 25 | 16 | 26 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 26 | 21 | 26 | 15 | 22 | 22 | 27 | 17 |

Sample Title: HTC-A03-S002-3036-02

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 18 | 22 | 30 | 18 | 20 | 24 | 23 | 25 |
| 385: | 19 | 18 | 24 | 37 | 29 | 26 | 26 | 21 |
| 393: | 24 | 14 | 16 | 17 | 24 | 23 | 17 | 21 |
| 401: | 25 | 21 | 27 | 40 | 16 | 28 | 27 | 21 |
| 409: | 29 | 34 | 22 | 17 | 22 | 33 | 20 | 19 |
| 417: | 19 | 24 | 22 | 17 | 21 | 22 | 23 | 21 |
| 425: | 20 | 18 | 25 | 14 | 26 | 20 | 19 | 18 |
| 433: | 17 | 16 | 14 | 21 | 33 | 27 | 17 | 15 |
| 441: | 26 | 17 | 18 | 18 | 14 | 24 | 17 | 26 |
| 449: | 20 | 27 | 14 | 19 | 19 | 22 | 22 | 13 |
| 457: | 19 | 22 | 19 | 25 | 19 | 29 | 42 | 38 |
| 465: | 16 | 17 | 16 | 18 | 18 | 21 | 8 | 16 |
| 473: | 22 | 13 | 14 | 26 | 12 | 22 | 23 | 23 |
| 481: | 10 | 12 | 21 | 13 | 15 | 17 | 18 | 10 |
| 489: | 10 | 13 | 30 | 18 | 13 | 16 | 13 | 14 |
| 497: | 9 | 11 | 10 | 16 | 10 | 15 | 12 | 15 |
| 505: | 18 | 13 | 17 | 16 | 27 | 62 | 94 | 51 |
| 513: | 33 | 22 | 21 | 18 | 11 | 13 | 16 | 17 |
| 521: | 15 | 14 | 10 | 20 | 19 | 11 | 12 | 18 |
| 529: | 16 | 13 | 14 | 13 | 14 | 10 | 13 | 11 |
| 537: | 8 | 9 | 12 | 22 | 13 | 14 | 15 | 13 |
| 545: | 12 | 19 | 13 | 16 | 13 | 24 | 20 | 13 |
| 553: | 12 | 19 | 12 | 20 | 12 | 15 | 13 | 17 |
| 561: | 23 | 21 | 15 | 16 | 14 | 11 | 20 | 17 |
| 569: | 10 | 7 | 22 | 9 | 12 | 11 | 15 | 14 |
| 577: | 13 | 23 | 14 | 15 | 20 | 41 | 149 | 138 |
| 585: | 30 | 17 | 18 | 20 | 6 | 15 | 24 | 14 |
| 593: | 12 | 15 | 10 | 12 | 14 | 11 | 11 | 13 |
| 601: | 14 | 10 | 17 | 15 | 21 | 12 | 21 | 39 |
| 609: | 158 | 152 | 44 | 14 | 13 | 13 | 10 | 18 |
| 617: | 14 | 12 | 14 | 7 | 17 | 14 | 15 | 7 |
| 625: | 12 | 10 | 11 | 6 | 15 | 11 | 7 | 13 |
| 633: | 9 | 13 | 14 | 12 | 12 | 12 | 16 | 13 |
| 641: | 11 | 16 | 14 | 9 | 8 | 15 | 11 | 10 |
| 649: | 13 | 15 | 15 | 9 | 8 | 18 | 16 | 14 |
| 657: | 15 | 12 | 21 | 23 | 38 | 72 | 23 | 14 |
| 665: | 18 | 23 | 8 | 22 | 19 | 12 | 12 | 11 |
| 673: | 13 | 10 | 18 | 18 | 8 | 7 | 13 | 8 |
| 681: | 14 | 13 | 13 | 18 | 12 | 11 | 11 | 13 |
| 689: | 14 | 22 | 10 | 15 | 12 | 12 | 9 | 16 |
| 697: | 15 | 15 | 8 | 24 | 12 | 14 | 14 | 13 |
| 705: | 19 | 9 | 15 | 10 | 9 | 6 | 17 | 10 |
| 713: | 17 | 11 | 16 | 3 | 11 | 10 | 10 | 13 |
| 721: | 12 | 14 | 9 | 15 | 10 | 20 | 26 | 35 |
| 729: | 13 | 11 | 7 | 13 | 8 | 16 | 16 | 10 |
| 737: | 12 | 9 | 10 | 9 | 6 | 9 | 12 | 8 |
| 745: | 5 | 4 | 7 | 9 | 14 | 15 | 9 | 13 |
| 753: | 7 | 21 | 11 | 15 | 14 | 9 | 16 | 14 |
| 761: | 9 | 8 | 8 | 6 | 8 | 12 | 13 | 20 |
| 769: | 18 | 10 | 17 | 14 | 13 | 9 | 12 | 7 |
| 777: | 11 | 13 | 7 | 13 | 3 | 9 | 12 | 9 |
| 785: | 15 | 14 | 10 | 8 | 4 | 6 | 4 | 10 |
| 793: | 11 | 9 | 32 | 16 | 5 | 6 | 10 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 10 | 7 | 9 | 17 | 13 | 10 | 11 | 9 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 8 | 8 | 6 | 12 | 12 | 7 | 8 | 6 |
| 817: | 8 | 10 | 14 | 13 | 6 | 15 | 9 | 7 |
| 825: | 10 | 5 | 8 | 11 | 6 | 9 | 14 | 9 |
| 833: | 10 | 4 | 12 | 12 | 10 | 10 | 10 | 12 |
| 841: | 12 | 6 | 11 | 6 | 5 | 10 | 11 | 11 |
| 849: | 12 | 13 | 9 | 6 | 9 | 2 | 12 | 8 |
| 857: | 6 | 12 | 12 | 24 | 28 | 18 | 8 | 19 |
| 865: | 5 | 4 | 9 | 11 | 1 | 8 | 10 | 8 |
| 873: | 13 | 6 | 8 | 6 | 7 | 6 | 7 | 6 |
| 881: | 7 | 10 | 10 | 6 | 5 | 12 | 6 | 7 |
| 889: | 8 | 7 | 14 | 3 | 3 | 10 | 5 | 6 |
| 897: | 6 | 8 | 7 | 12 | 8 | 9 | 6 | 13 |
| 905: | 15 | 8 | 5 | 6 | 8 | 47 | 102 | 65 |
| 913: | 17 | 12 | 10 | 5 | 7 | 7 | 4 | 8 |
| 921: | 11 | 5 | 9 | 17 | 10 | 9 | 6 | 5 |
| 929: | 10 | 8 | 5 | 6 | 7 | 27 | 14 | 16 |
| 937: | 6 | 7 | 9 | 11 | 7 | 10 | 4 | 4 |
| 945: | 3 | 5 | 13 | 8 | 5 | 12 | 7 | 9 |
| 953: | 8 | 14 | 6 | 10 | 1 | 3 | 5 | 10 |
| 961: | 5 | 11 | 14 | 21 | 30 | 14 | 15 | 32 |
| 969: | 54 | 39 | 16 | 2 | 4 | 12 | 8 | 8 |
| 977: | 8 | 5 | 11 | 6 | 10 | 8 | 8 | 5 |
| 985: | 10 | 7 | 5 | 11 | 11 | 10 | 12 | 4 |
| 993: | 9 | 7 | 7 | 6 | 5 | 4 | 8 | 14 |
| 1001: | 10 | 7 | 4 | 5 | 15 | 7 | 9 | 8 |
| 1009: | 13 | 6 | 8 | 10 | 11 | 8 | 11 | 8 |
| 1017: | 7 | 8 | 6 | 6 | 6 | 7 | 6 | 13 |
| 1025: | 5 | 4 | 7 | 4 | 9 | 9 | 5 | 8 |
| 1033: | 7 | 12 | 6 | 2 | 4 | 6 | 5 | 7 |
| 1041: | 10 | 5 | 7 | 7 | 10 | 9 | 7 | 5 |
| 1049: | 5 | 2 | 13 | 10 | 5 | 9 | 11 | 7 |
| 1057: | 3 | 6 | 4 | 10 | 7 | 5 | 8 | 7 |
| 1065: | 8 | 7 | 12 | 8 | 10 | 9 | 6 | 5 |
| 1073: | 7 | 4 | 5 | 12 | 10 | 11 | 15 | 8 |
| 1081: | 4 | 11 | 5 | 6 | 8 | 5 | 11 | 12 |
| 1089: | 9 | 8 | 8 | 4 | 5 | 8 | 9 | 7 |
| 1097: | 6 | 7 | 7 | 8 | 11 | 11 | 12 | 11 |
| 1105: | 9 | 9 | 6 | 11 | 10 | 17 | 11 | 9 |
| 1113: | 4 | 10 | 5 | 2 | 13 | 15 | 17 | 44 |
| 1121: | 32 | 17 | 15 | 15 | 9 | 5 | 9 | 9 |
| 1129: | 13 | 8 | 6 | 6 | 12 | 11 | 12 | 8 |
| 1137: | 15 | 9 | 10 | 4 | 13 | 8 | 4 | 7 |
| 1145: | 7 | 5 | 7 | 12 | 15 | 9 | 11 | 7 |
| 1153: | 8 | 3 | 10 | 9 | 13 | 8 | 5 | 10 |
| 1161: | 7 | 13 | 9 | 10 | 11 | 6 | 12 | 7 |
| 1169: | 7 | 10 | 9 | 7 | 9 | 9 | 8 | 4 |
| 1177: | 13 | 13 | 9 | 9 | 11 | 5 | 6 | 10 |
| 1185: | 12 | 12 | 13 | 14 | 9 | 9 | 11 | 4 |
| 1193: | 12 | 11 | 8 | 3 | 6 | 9 | 10 | 9 |
| 1201: | 6 | 8 | 7 | 15 | 13 | 3 | 8 | 8 |
| 1209: | 10 | 6 | 12 | 14 | 7 | 10 | 14 | 8 |
| 1217: | 5 | 15 | 10 | 14 | 15 | 10 | 12 | 11 |
| 1225: | 8 | 12 | 12 | 13 | 4 | 7 | 6 | 6 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 8 | 7 | 8 | 10 | 18 | 24 | 19 | 10 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 6 | 6 | 11 | 11 | 14 | 12 | 11 | 9 |
| 1249: | 7 | 6 | 5 | 9 | 9 | 9 | 3 | 6 |
| 1257: | 6 | 8 | 11 | 8 | 9 | 4 | 7 | 7 |
| 1265: | 5 | 5 | 6 | 10 | 6 | 7 | 5 | 9 |
| 1273: | 7 | 6 | 7 | 8 | 5 | 8 | 4 | 11 |
| 1281: | 12 | 6 | 10 | 7 | 2 | 5 | 8 | 5 |
| 1289: | 6 | 5 | 3 | 5 | 8 | 4 | 5 | 6 |
| 1297: | 6 | 3 | 6 | 8 | 3 | 6 | 9 | 5 |
| 1305: | 4 | 4 | 7 | 6 | 7 | 4 | 5 | 1 |
| 1313: | 5 | 3 | 8 | 6 | 5 | 2 | 7 | 7 |
| 1321: | 8 | 2 | 3 | 4 | 8 | 3 | 4 | 4 |
| 1329: | 3 | 3 | 2 | 3 | 5 | 1 | 9 | 2 |
| 1337: | 3 | 3 | 3 | 8 | 4 | 4 | 3 | 6 |
| 1345: | 3 | 3 | 2 | 3 | 2 | 4 | 7 | 4 |
| 1353: | 2 | 3 | 3 | 9 | 5 | 5 | 3 | 6 |
| 1361: | 5 | 1 | 4 | 6 | 1 | 2 | 2 | 2 |
| 1369: | 1 | 4 | 2 | 7 | 3 | 2 | 1 | 5 |
| 1377: | 8 | 11 | 4 | 3 | 3 | 3 | 2 | 7 |
| 1385: | 6 | 3 | 5 | 1 | 2 | 1 | 1 | 2 |
| 1393: | 5 | 5 | 1 | 1 | 3 | 1 | 3 | 3 |
| 1401: | 2 | 8 | 3 | 1 | 1 | 2 | 1 | 12 |
| 1409: | 4 | 3 | 4 | 6 | 3 | 1 | 7 | 3 |
| 1417: | 4 | 4 | 4 | 4 | 1 | 4 | 1 | 0 |
| 1425: | 3 | 1 | 2 | 5 | 2 | 3 | 3 | 3 |
| 1433: | 4 | 2 | 3 | 2 | 3 | 1 | 3 | 2 |
| 1441: | 5 | 1 | 1 | 4 | 0 | 0 | 3 | 3 |
| 1449: | 1 | 4 | 1 | 4 | 2 | 3 | 1 | 7 |
| 1457: | 7 | 21 | 116 | 339 | 386 | 129 | 24 | 13 |
| 1465: | 16 | 3 | 7 | 3 | 0 | 4 | 2 | 2 |
| 1473: | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 5 |
| 1481: | 3 | 2 | 3 | 0 | 2 | 1 | 5 | 4 |
| 1489: | 1 | 1 | 1 | 3 | 4 | 2 | 5 | 8 |
| 1497: | 3 | 3 | 3 | 5 | 2 | 3 | 2 | 1 |
| 1505: | 2 | 2 | 3 | 4 | 4 | 4 | 6 | 1 |
| 1513: | 3 | 3 | 2 | 2 | 3 | 0 | 2 | 1 |
| 1521: | 0 | 1 | 3 | 3 | 4 | 2 | 3 | 3 |
| 1529: | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 3 |
| 1537: | 2 | 6 | 2 | 6 | 1 | 2 | 2 | 0 |
| 1545: | 1 | 2 | 1 | 0 | 2 | 2 | 3 | 3 |
| 1553: | 0 | 3 | 0 | 2 | 1 | 2 | 1 | 0 |
| 1561: | 1 | 2 | 1 | 0 | 2 | 2 | 1 | 3 |
| 1569: | 0 | 3 | 2 | 3 | 1 | 0 | 1 | 0 |
| 1577: | 2 | 0 | 1 | 4 | 3 | 0 | 0 | 1 |
| 1585: | 1 | 7 | 5 | 13 | 3 | 1 | 6 | 4 |
| 1593: | 8 | 1 | 2 | 1 | 4 | 5 | 4 | 3 |
| 1601: | 4 | 2 | 2 | 1 | 2 | 1 | 3 | 1 |
| 1609: | 4 | 3 | 2 | 1 | 0 | 2 | 2 | 4 |
| 1617: | 2 | 1 | 3 | 5 | 4 | 4 | 1 | 2 |
| 1625: | 0 | 1 | 2 | 2 | 2 | 4 | 4 | 1 |
| 1633: | 1 | 1 | 4 | 2 | 3 | 3 | 4 | 3 |
| 1641: | 1 | 3 | 1 | 2 | 1 | 2 | 0 | 2 |
| 1649: | 1 | 3 | 1 | 2 | 1 | 0 | 0 | 0 |
| 1657: | 0 | 2 | 4 | 2 | 3 | 5 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 1 | 1 | 1 | 2 | 1 | 3 | 0 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 2 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 1681: | 0 | 1 | 3 | 1 | 2 | 3 | 3 | 1 |
| 1689: | 1 | 0 | 2 | 0 | 2 | 3 | 1 | 2 |
| 1697: | 0 | 1 | 3 | 1 | 0 | 1 | 2 | 3 |
| 1705: | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 1 |
| 1713: | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 1 |
| 1721: | 0 | 1 | 1 | 3 | 2 | 1 | 1 | 4 |
| 1729: | 4 | 10 | 0 | 2 | 3 | 1 | 1 | 3 |
| 1737: | 1 | 0 | 2 | 1 | 4 | 1 | 0 | 0 |
| 1745: | 1 | 1 | 0 | 1 | 2 | 2 | 0 | 4 |
| 1753: | 0 | 2 | 2 | 1 | 0 | 2 | 1 | 3 |
| 1761: | 0 | 7 | 15 | 30 | 17 | 4 | 3 | 0 |
| 1769: | 0 | 3 | 0 | 1 | 1 | 0 | 2 | 2 |
| 1777: | 0 | 1 | 2 | 0 | 2 | 1 | 0 | 0 |
| 1785: | 0 | 2 | 3 | 1 | 3 | 1 | 1 | 2 |
| 1793: | 1 | 0 | 2 | 0 | 1 | 1 | 3 | 1 |
| 1801: | 0 | 1 | 0 | 2 | 0 | 3 | 1 | 0 |
| 1809: | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 0 |
| 1817: | 1 | 1 | 0 | 1 | 1 | 2 | 2 | 0 |
| 1825: | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 |
| 1833: | 0 | 1 | 0 | 0 | 1 | 2 | 3 | 2 |
| 1841: | 1 | 0 | 0 | 0 | 1 | 3 | 6 | 3 |
| 1849: | 1 | 1 | 0 | 1 | 3 | 1 | 2 | 1 |
| 1857: | 0 | 1 | 2 | 1 | 1 | 2 | 3 | 2 |
| 1865: | 1 | 2 | 0 | 1 | 3 | 0 | 1 | 0 |
| 1873: | 3 | 0 | 0 | 4 | 0 | 1 | 1 | 2 |
| 1881: | 1 | 1 | 0 | 3 | 0 | 0 | 1 | 3 |
| 1889: | 1 | 4 | 1 | 0 | 2 | 0 | 2 | 1 |
| 1897: | 3 | 3 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1905: | 2 | 0 | 1 | 1 | 0 | 1 | 2 | 0 |
| 1913: | 3 | 1 | 1 | 2 | 1 | 1 | 3 | 2 |
| 1921: | 2 | 3 | 1 | 2 | 1 | 1 | 1 | 0 |
| 1929: | 1 | 1 | 0 | 1 | 2 | 3 | 1 | 1 |
| 1937: | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 1945: | 2 | 1 | 2 | 0 | 1 | 1 | 0 | 0 |
| 1953: | 0 | 1 | 2 | 1 | 4 | 1 | 1 | 0 |
| 1961: | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 0 |
| 1969: | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 0 |
| 1977: | 1 | 3 | 1 | 2 | 2 | 0 | 1 | 0 |
| 1985: | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 |
| 1993: | 1 | 2 | 1 | 1 | 2 | 3 | 0 | 1 |
| 2001: | 2 | 3 | 1 | 0 | 1 | 2 | 3 | 2 |
| 2009: | 2 | 2 | 0 | 0 | 1 | 2 | 1 | 2 |
| 2017: | 1 | 0 | 4 | 0 | 1 | 1 | 0 | 0 |
| 2025: | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 1 |
| 2033: | 0 | 1 | 1 | 1 | 0 | 2 | 2 | 0 |
| 2041: | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 0 |
| 2049: | 3 | 2 | 1 | 2 | 3 | 3 | 2 | 3 |
| 2057: | 0 | 0 | 2 | 0 | 3 | 2 | 1 | 1 |
| 2065: | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 2073: | 0 | 1 | 2 | 1 | 0 | 2 | 0 | 1 |
| 2081: | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 2 |
| 2089: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 2 | 2 | 1 | 0 | 2 | 2 | 5 | 2 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 1 | 4 | 3 | 2 | 1 | 1 | 2 | 2 |
| 2113: | 2 | 2 | 0 | 0 | 2 | 2 | 5 | 0 |
| 2121: | 3 | 2 | 0 | 1 | 0 | 0 | 1 | 2 |
| 2129: | 1 | 1 | 2 | 0 | 2 | 1 | 0 | 2 |
| 2137: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 2 |
| 2145: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 2153: | 2 | 0 | 2 | 1 | 2 | 0 | 1 | 0 |
| 2161: | 0 | 0 | 2 | 0 | 1 | 1 | 2 | 1 |
| 2169: | 3 | 2 | 2 | 0 | 0 | 1 | 1 | 0 |
| 2177: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2185: | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 1 |
| 2193: | 2 | 0 | 1 | 0 | 1 | 2 | 0 | 2 |
| 2201: | 1 | 5 | 9 | 8 | 5 | 0 | 0 | 4 |
| 2209: | 1 | 3 | 2 | 1 | 0 | 1 | 0 | 1 |
| 2217: | 0 | 0 | 3 | 0 | 0 | 2 | 2 | 2 |
| 2225: | 2 | 1 | 1 | 4 | 2 | 1 | 0 | 2 |
| 2233: | 1 | 1 | 2 | 1 | 0 | 0 | 0 | 0 |
| 2241: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| 2249: | 0 | 2 | 2 | 1 | 3 | 1 | 1 | 4 |
| 2257: | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 |
| 2265: | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 1 |
| 2273: | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 1 |
| 2281: | 0 | 0 | 2 | 1 | 0 | 2 | 0 | 1 |
| 2289: | 0 | 0 | 1 | 3 | 2 | 0 | 1 | 1 |
| 2297: | 0 | 1 | 1 | 3 | 1 | 0 | 0 | 3 |
| 2305: | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 |
| 2313: | 3 | 1 | 0 | 0 | 1 | 2 | 2 | 1 |
| 2321: | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 |
| 2329: | 1 | 2 | 2 | 1 | 4 | 1 | 1 | 0 |
| 2337: | 1 | 1 | 1 | 3 | 1 | 2 | 3 | 2 |
| 2345: | 1 | 4 | 1 | 0 | 3 | 2 | 2 | 2 |
| 2353: | 3 | 1 | 3 | 1 | 0 | 0 | 1 | 2 |
| 2361: | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 2369: | 2 | 2 | 1 | 1 | 3 | 3 | 1 | 2 |
| 2377: | 2 | 2 | 1 | 1 | 2 | 4 | 2 | 0 |
| 2385: | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 1 |
| 2393: | 1 | 0 | 2 | 1 | 1 | 3 | 0 | 0 |
| 2401: | 0 | 0 | 4 | 1 | 3 | 0 | 1 | 0 |
| 2409: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2417: | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 1 |
| 2425: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2433: | 1 | 0 | 0 | 0 | 4 | 1 | 0 | 1 |
| 2441: | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 3 |
| 2449: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2457: | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 2 |
| 2465: | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 2 |
| 2473: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2481: | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 1 |
| 2489: | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2497: | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| 2505: | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2513: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2521: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| 2545: | 0 | 1 | 2 | 1 | 1 | 1 | 0 | 0 |
| 2553: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2561: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2569: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| 2577: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 2585: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2593: | 0 | 2 | 3 | 0 | 1 | 0 | 1 | 1 |
| 2601: | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 |
| 2609: | 0 | 1 | 4 | 16 | 31 | 28 | 12 | 5 |
| 2617: | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 0 |
| 2625: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2633: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2649: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2657: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2673: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| 2681: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 2 |
| 2689: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2697: | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 2705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2713: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2721: | 0 | 0 | 1 | 0 | 3 | 0 | 1 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2737: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2753: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2761: | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 1 |
| 2769: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2777: | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 |
| 2785: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2793: | 2 | 1 | 1 | 0 | 1 | 0 | 1 | 2 |
| 2801: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2817: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2825: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2841: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2849: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2865: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2873: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2881: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2889: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2897: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2913: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2929: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2953: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2977: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 3009: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3049: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 3057: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3065: | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 |
| 3073: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3081: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3089: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 3113: | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3121: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3145: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3161: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3177: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3193: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3233: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3241: | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 |
| 3249: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3265: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 3305: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3337: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3345: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3385: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-3036-02

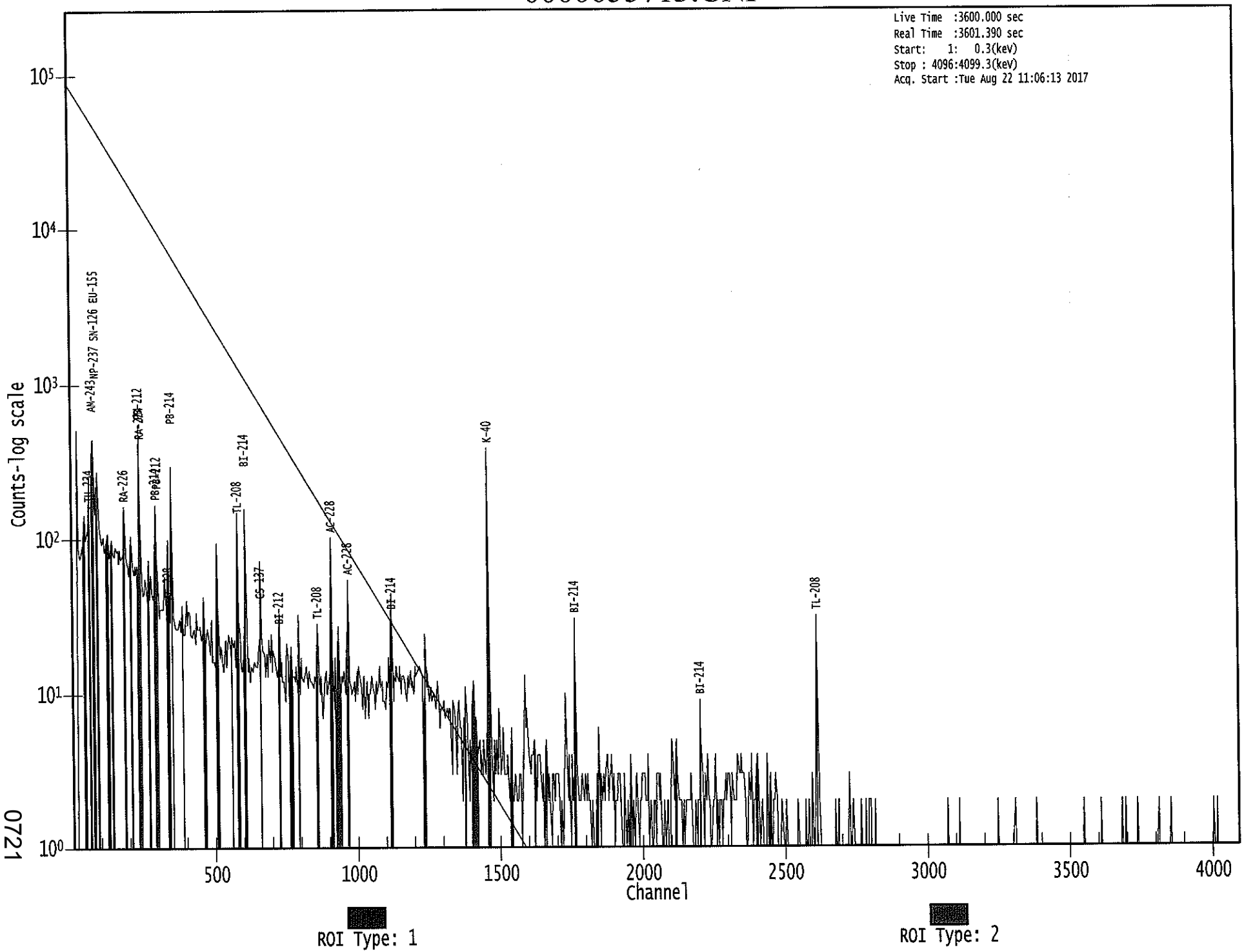
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3417: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3457: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3473: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3489: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3497: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3505: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| 3553: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 3601: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3609: | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3625: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3657: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3681: | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |
| 3697: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 3737: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3745: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3769: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3785: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-3036-02

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3865: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4017: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

# 0000055713.CNF




0721

KP 8/22/17



Apex-Gamma

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-13 |
| Sample Description | : HTC-A03-S002-3642-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.443E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:44:55AM |
| Acquisition Started | : 8/22/2017 11:06:20AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE2 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.1 seconds |
| Dead Time | : 0.03 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 29 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 8/19/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55714 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG 8/23/17

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 12:06:54PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 46.49 | 46.84 | 0.0000 | 0.00 |
| 2 | 62.53 | 62.86 | 0.0000 | 0.00 |
| 3 | 76.22 | 76.53 | 0.0000 | 0.00 |
| 4 | 92.26 | 92.56 | 0.0000 | 0.00 |
| 5 | 162.96 | 163.18 | 0.0000 | 0.00 |
| 6 | 185.86 | 186.05 | 0.0000 | 0.00 |
| 7 | 209.43 | 209.59 | 0.0000 | 0.00 |
| 8 | 219.57 | 219.72 | 0.0000 | 0.00 |
| 9 | 238.74 | 238.87 | 0.0000 | 0.00 |
| 10 | 242.09 | 242.23 | 0.0000 | 0.00 |
| 11 | 270.10 | 270.20 | 0.0000 | 0.00 |
| 12 | 277.27 | 277.37 | 0.0000 | 0.00 |
| 13 | 295.02 | 295.10 | 0.0000 | 0.00 |
| 14 | 300.66 | 300.73 | 0.0000 | 0.00 |
| 15 | 305.94 | 306.01 | 0.0000 | 0.00 |
| 16 | 313.27 | 313.33 | 0.0000 | 0.00 |
| 17 | 328.29 | 328.34 | 0.0000 | 0.00 |
| 18 | 338.64 | 338.67 | 0.0000 | 0.00 |
| 19 | 351.87 | 351.89 | 0.0000 | 0.00 |
| 20 | 409.40 | 409.36 | 0.0000 | 0.00 |
| 21 | 472.83 | 472.72 | 0.0000 | 0.00 |
| 22 | 510.95 | 510.81 | 0.0000 | 0.00 |
| 23 | 583.12 | 582.90 | 0.0000 | 0.00 |
| 24 | 609.39 | 609.14 | 0.0000 | 0.00 |
| 25 | 663.38 | 663.08 | 0.0000 | 0.00 |
| 26 | 727.44 | 727.08 | 0.0000 | 0.00 |
| 27 | 745.65 | 745.27 | 0.0000 | 0.00 |
| 28 | 769.02 | 768.62 | 0.0000 | 0.00 |
| 29 | 784.34 | 783.93 | 0.0000 | 0.00 |
| 30 | 795.55 | 795.12 | 0.0000 | 0.00 |
| 31 | 840.68 | 840.21 | 0.0000 | 0.00 |
| 32 | 861.40 | 860.91 | 0.0000 | 0.00 |
| 33 | 911.68 | 911.14 | 0.0000 | 0.00 |
| 34 | 965.39 | 964.80 | 0.0000 | 0.00 |
| 35 | 969.39 | 968.80 | 0.0000 | 0.00 |
| 36 | 978.18 | 977.58 | 0.0000 | 0.00 |
| 37 | 1088.94 | 1088.24 | 0.0000 | 0.00 |
| 38 | 1103.59 | 1102.88 | 0.0000 | 0.00 |
| 39 | 1120.91 | 1120.18 | 0.0000 | 0.00 |
| 40 | 1353.00 | 1352.07 | 0.0000 | 0.00 |
| 41 | 1378.35 | 1377.39 | 0.0000 | 0.00 |
| 42 | 1385.47 | 1384.51 | 0.0000 | 0.00 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1461.31 | 1460.29 | 0.0000 | 0.00 |
| 44 | 1481.32 | 1480.28 | 0.0000 | 0.00 |
| 45 | 1495.79 | 1494.74 | 0.0000 | 0.00 |
| 46 | 1510.17 | 1509.10 | 0.0000 | 0.00 |
| 47 | 1578.19 | 1577.07 | 0.0000 | 0.00 |
| 48 | 1590.61 | 1589.47 | 0.0000 | 0.00 |
| 49 | 1716.98 | 1715.75 | 0.0000 | 0.00 |
| 50 | 1730.41 | 1729.16 | 0.0000 | 0.00 |
| 51 | 1764.96 | 1763.69 | 0.0000 | 0.00 |
| 52 | 1859.78 | 1858.44 | 0.0000 | 0.00 |
| 53 | 2193.09 | 2191.51 | 0.0000 | 0.00 |
| 54 | 2204.76 | 2203.17 | 0.0000 | 0.00 |
| 55 | 2614.93 | 2613.06 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 12:06:54PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 46.49 | 45 - | 49 | 46.84 | 9.45E+01 | 57.40 | 6.49E+02 | 1.13 |
| | 2 | 62.53 | 59 - | 65 | 62.86 | 1.47E+02 | 89.78 | 1.37E+03 | 1.81 |
| | 3 | 76.22 | 72 - | 83 | 76.53 | 8.26E+02 | 157.75 | 2.67E+03 | 3.82 |
| | 4 | 92.26 | 89 - | 96 | 92.56 | 2.85E+02 | 104.92 | 1.58E+03 | 1.48 |
| | 5 | 162.96 | 159 - | 168 | 163.18 | 1.34E+02 | 85.81 | 9.77E+02 | 5.30 |
| | 6 | 185.86 | 183 - | 189 | 186.05 | 1.81E+02 | 66.21 | 6.66E+02 | 1.40 |
| | 7 | 209.43 | 207 - | 213 | 209.59 | 7.30E+01 | 60.02 | 6.02E+02 | 2.25 |
| | 8 | 219.57 | 217 - | 222 | 219.72 | 4.39E+01 | 51.88 | 5.02E+02 | 1.78 |
| M | 9 | 238.74 | 234 - | 247 | 238.87 | 6.92E+02 | 65.24 | 3.04E+02 | 1.45 |
| m | 10 | 242.09 | 234 - | 247 | 242.23 | 1.08E+02 | 44.81 | 2.78E+02 | 1.46 |
| | 11 | 270.10 | 267 - | 274 | 270.20 | 6.15E+01 | 57.38 | 4.99E+02 | 1.80 |
| | 12 | 277.27 | 274 - | 280 | 277.37 | 3.81E+01 | 47.19 | 3.76E+02 | 2.86 |
| M | 13 | 295.02 | 290 - | 303 | 295.10 | 2.15E+02 | 45.49 | 2.52E+02 | 1.56 |
| m | 14 | 300.66 | 290 - | 303 | 300.73 | 5.10E+01 | 36.57 | 2.25E+02 | 1.57 |
| | 15 | 305.94 | 304 - | 309 | 306.01 | 4.16E+01 | 37.74 | 2.51E+02 | 4.48 |
| | 16 | 313.27 | 310 - | 316 | 313.33 | 4.10E+01 | 42.92 | 3.06E+02 | 1.22 |
| | 17 | 328.29 | 325 - | 332 | 328.34 | 6.92E+01 | 49.72 | 3.62E+02 | 1.47 |
| | 18 | 338.64 | 334 - | 343 | 338.67 | 1.31E+02 | 61.49 | 4.65E+02 | 2.03 |
| | 19 | 351.87 | 347 - | 355 | 351.89 | 4.16E+02 | 64.41 | 3.83E+02 | 1.39 |
| | 20 | 409.40 | 407 - | 412 | 409.36 | 2.69E+01 | 33.42 | 1.94E+02 | 2.74 |
| | 21 | 472.83 | 470 - | 476 | 472.72 | 2.61E+01 | 29.77 | 1.46E+02 | 1.47 |
| | 22 | 510.95 | 506 - | 516 | 510.81 | 1.69E+02 | 48.27 | 2.21E+02 | 2.40 |
| | 23 | 583.12 | 578 - | 587 | 582.90 | 2.29E+02 | 48.12 | 2.01E+02 | 1.58 |
| | 24 | 609.39 | 605 - | 613 | 609.14 | 2.98E+02 | 49.26 | 1.91E+02 | 1.57 |
| | 25 | 663.38 | 658 - | 667 | 663.08 | 3.44E+01 | 36.41 | 1.69E+02 | 4.26 |
| | 26 | 727.44 | 724 - | 731 | 727.08 | 3.17E+01 | 36.11 | 1.97E+02 | 1.47 |
| | 27 | 745.65 | 741 - | 749 | 745.27 | 4.48E+01 | 29.22 | 1.04E+02 | 5.41 |
| | 28 | 769.02 | 764 - | 773 | 768.62 | 2.85E+01 | 34.68 | 1.57E+02 | 5.72 |
| | 29 | 784.34 | 780 - | 788 | 783.93 | 5.17E+01 | 24.89 | 6.46E+01 | 3.83 |
| | 30 | 795.55 | 791 - | 800 | 795.12 | 3.69E+01 | 34.07 | 1.44E+02 | 1.95 |
| | 31 | 840.68 | 832 - | 848 | 840.21 | 6.00E+01 | 46.88 | 1.84E+02 | 9.93 |
| | 32 | 861.40 | 856 - | 865 | 860.91 | 5.16E+01 | 32.88 | 1.25E+02 | 1.79 |
| | 33 | 911.68 | 905 - | 915 | 911.14 | 1.43E+02 | 42.06 | 1.61E+02 | 2.22 |
| M | 34 | 965.39 | 962 - | 973 | 964.80 | 3.37E+01 | 19.42 | 6.36E+01 | 2.21 |
| m | 35 | 969.39 | 962 - | 973 | 968.80 | 1.08E+02 | 30.48 | 6.45E+01 | 2.22 |
| | 36 | 978.18 | 974 - | 981 | 977.58 | 1.65E+01 | 20.69 | 6.10E+01 | 1.80 |
| | 37 | 1088.94 | 1086 - | 1091 | 1088.24 | 1.58E+01 | 17.80 | 5.04E+01 | 3.15 |
| | 38 | 1103.59 | 1100 - | 1107 | 1102.88 | 2.00E+01 | 22.36 | 6.60E+01 | 3.06 |
| | 39 | 1120.91 | 1116 - | 1124 | 1120.18 | 3.85E+01 | 33.95 | 1.55E+02 | 2.16 |
| | 40 | 1353.00 | 1348 - | 1359 | 1352.07 | 1.98E+01 | 16.61 | 2.63E+01 | 3.89 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| M | 41 | 1378.35 | 1373 - | 1387 | 1377.39 | 2.25E+01 | 16.12 | 2.74E+01 | 2.82 |
| m | 42 | 1385.47 | 1373 - | 1387 | 1384.51 | 1.67E+01 | 14.97 | 1.93E+01 | 2.82 |
| | 43 | 1461.31 | 1454 - | 1466 | 1460.29 | 7.30E+02 | 58.88 | 6.24E+01 | 2.21 |
| | 44 | 1481.32 | 1477 - | 1484 | 1480.28 | 8.00E+00 | 8.94 | 8.00E+00 | 2.95 |
| | 45 | 1495.79 | 1489 - | 1499 | 1494.74 | 1.61E+01 | 16.35 | 2.59E+01 | 3.00 |
| | 46 | 1510.17 | 1506 - | 1513 | 1509.10 | 1.45E+01 | 11.31 | 1.09E+01 | 2.32 |
| | 47 | 1578.19 | 1568 - | 1585 | 1577.07 | 4.20E+01 | 12.96 | 0.00E+00 | 12.26 |
| | 48 | 1590.61 | 1585 - | 1594 | 1589.47 | 2.07E+01 | 18.08 | 3.47E+01 | 5.41 |
| | 49 | 1716.98 | 1712 - | 1718 | 1715.75 | 6.25E+00 | 6.65 | 3.50E+00 | 2.72 |
| | 50 | 1730.41 | 1723 - | 1735 | 1729.16 | 1.46E+01 | 14.92 | 1.89E+01 | 3.43 |
| | 51 | 1764.96 | 1760 - | 1767 | 1763.69 | 7.22E+01 | 17.66 | 3.66E+00 | 2.91 |
| | 52 | 1859.78 | 1854 - | 1863 | 1858.44 | 1.60E+01 | 8.00 | 0.00E+00 | 1.45 |
| | 53 | 2193.09 | 2188 - | 2194 | 2191.51 | 8.30E+00 | 7.23 | 3.40E+00 | 4.51 |
| | 54 | 2204.76 | 2196 - | 2208 | 2203.17 | 2.05E+01 | 15.71 | 1.90E+01 | 3.48 |
| | 55 | 2614.93 | 2607 - | 2619 | 2613.06 | 9.80E+01 | 19.80 | 0.00E+00 | 2.89 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 12:06:54PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 46.49 | 45 - | 49 | 9.45E+01 | 57.40 | 6.49E+02 | 4.44E+01 |
| | 2 | 62.53 | 59 - | 65 | 1.47E+02 | 89.78 | 1.37E+03 | 7.11E+01 |
| | 3 | 76.22 | 72 - | 83 | 8.26E+02 | 157.75 | 2.67E+03 | 1.21E+02 |
| | 4 | 92.26 | 89 - | 96 | 2.85E+02 | 104.92 | 1.58E+03 | 8.17E+01 |
| | 5 | 162.96 | 159 - | 168 | 1.34E+02 | 85.81 | 9.77E+02 | 6.79E+01 |
| | 6 | 185.86 | 183 - | 189 | 1.81E+02 | 66.21 | 6.66E+02 | 4.97E+01 |
| | 7 | 209.43 | 207 - | 213 | 7.30E+01 | 60.02 | 6.02E+02 | 4.73E+01 |
| | 8 | 219.57 | 217 - | 222 | 4.39E+01 | 51.88 | 5.02E+02 | 4.12E+01 |
| M | 9 | 238.74 | 234 - | 247 | 6.92E+02 | 65.24 | 3.04E+02 | 2.86E+01 |
| m | 10 | 242.09 | 234 - | 247 | 1.08E+02 | 44.81 | 2.78E+02 | 2.74E+01 |
| | 11 | 270.10 | 267 - | 274 | 6.15E+01 | 57.38 | 4.99E+02 | 4.54E+01 |
| | 12 | 277.27 | 274 - | 280 | 3.81E+01 | 47.19 | 3.76E+02 | 3.74E+01 |
| M | 13 | 295.02 | 290 - | 303 | 2.15E+02 | 45.49 | 2.52E+02 | 2.61E+01 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| m | 14 | 300.66 | 290 - | 303 | 5.10E+01 | 36.57 | 2.25E+02 | 2.46E+01 |
| | 15 | 305.94 | 304 - | 309 | 4.16E+01 | 37.74 | 2.51E+02 | 2.91E+01 |
| | 16 | 313.27 | 310 - | 316 | 4.10E+01 | 42.92 | 3.06E+02 | 3.37E+01 |
| | 17 | 328.29 | 325 - | 332 | 6.92E+01 | 49.72 | 3.62E+02 | 3.85E+01 |
| | 18 | 338.64 | 334 - | 343 | 1.31E+02 | 61.49 | 4.65E+02 | 4.69E+01 |
| | 19 | 351.87 | 347 - | 355 | 4.16E+02 | 64.41 | 3.83E+02 | 2.43E+01 |
| | 20 | 409.40 | 407 - | 412 | 2.69E+01 | 33.42 | 1.94E+02 | 2.61E+01 |
| | 21 | 472.83 | 470 - | 476 | 2.61E+01 | 29.77 | 1.46E+02 | 2.30E+01 |
| | 22 | 510.95 | 506 - | 516 | 1.69E+02 | 48.27 | 2.21E+02 | 3.34E+01 |
| | 23 | 583.12 | 578 - | 587 | 2.29E+02 | 48.12 | 2.01E+02 | 3.08E+01 |
| | 24 | 609.39 | 605 - | 613 | 2.98E+02 | 49.26 | 1.91E+02 | 2.89E+01 |
| | 25 | 663.38 | 658 - | 667 | 3.44E+01 | 36.41 | 1.69E+02 | 2.83E+01 |
| | 26 | 727.44 | 724 - | 731 | 3.17E+01 | 36.11 | 1.97E+02 | 2.82E+01 |
| | 27 | 745.65 | 741 - | 749 | 4.48E+01 | 29.22 | 1.04E+02 | 2.14E+01 |
| | 28 | 769.02 | 764 - | 773 | 2.85E+01 | 34.68 | 1.57E+02 | 2.71E+01 |
| | 29 | 784.34 | 780 - | 788 | 5.17E+01 | 24.89 | 6.46E+01 | 1.67E+01 |
| | 30 | 795.55 | 791 - | 800 | 3.69E+01 | 34.07 | 1.44E+02 | 2.62E+01 |
| | 31 | 840.68 | 832 - | 848 | 6.00E+01 | 46.88 | 1.84E+02 | 3.64E+01 |
| | 32 | 861.40 | 856 - | 865 | 5.16E+01 | 32.88 | 1.25E+02 | 2.43E+01 |
| | 33 | 911.68 | 905 - | 915 | 1.43E+02 | 42.06 | 1.61E+02 | 2.85E+01 |
| M | 34 | 965.39 | 962 - | 973 | 3.37E+01 | 19.42 | 6.36E+01 | 1.31E+01 |
| m | 35 | 969.39 | 962 - | 973 | 1.08E+02 | 30.48 | 6.45E+01 | 1.32E+01 |
| | 36 | 978.18 | 974 - | 981 | 1.65E+01 | 20.69 | 6.10E+01 | 1.56E+01 |
| | 37 | 1088.94 | 1086 - | 1091 | 1.58E+01 | 17.80 | 5.04E+01 | 1.31E+01 |
| | 38 | 1103.59 | 1100 - | 1107 | 2.00E+01 | 22.36 | 6.60E+01 | 1.68E+01 |
| | 39 | 1120.91 | 1116 - | 1124 | 3.85E+01 | 33.95 | 1.55E+02 | 2.60E+01 |
| | 40 | 1353.00 | 1348 - | 1359 | 1.98E+01 | 16.61 | 2.63E+01 | 1.15E+01 |
| M | 41 | 1378.35 | 1373 - | 1387 | 2.25E+01 | 16.12 | 2.74E+01 | 8.60E+00 |
| m | 42 | 1385.47 | 1373 - | 1387 | 1.67E+01 | 14.97 | 1.93E+01 | 7.23E+00 |
| | 43 | 1461.31 | 1454 - | 1466 | 7.30E+02 | 58.88 | 6.24E+01 | 1.92E+01 |
| | 44 | 1481.32 | 1477 - | 1484 | 8.00E+00 | 8.94 | 8.00E+00 | 5.70E+00 |
| | 45 | 1495.79 | 1489 - | 1499 | 1.61E+01 | 16.35 | 2.59E+01 | 1.17E+01 |
| | 46 | 1510.17 | 1506 - | 1513 | 1.45E+01 | 11.31 | 1.09E+01 | 6.87E+00 |
| | 47 | 1578.19 | 1568 - | 1585 | 4.20E+01 | 12.96 | 0.00E+00 | 0.00E+00 |
| | 48 | 1590.61 | 1585 - | 1594 | 2.07E+01 | 18.08 | 3.47E+01 | 1.28E+01 |
| | 49 | 1716.98 | 1712 - | 1718 | 6.25E+00 | 6.65 | 3.50E+00 | 3.61E+00 |
| | 50 | 1730.41 | 1723 - | 1735 | 1.46E+01 | 14.92 | 1.89E+01 | 1.05E+01 |
| | 51 | 1764.96 | 1760 - | 1767 | 7.22E+01 | 17.66 | 3.66E+00 | 3.97E+00 |
| | 52 | 1859.78 | 1854 - | 1863 | 1.60E+01 | 8.00 | 0.00E+00 | 0.00E+00 |
| | 53 | 2193.09 | 2188 - | 2194 | 8.30E+00 | 7.23 | 3.40E+00 | 3.59E+00 |
| | 54 | 2204.76 | 2196 - | 2208 | 2.05E+01 | 15.71 | 1.90E+01 | 1.06E+01 |
| | 55 | 2614.93 | 2607 - | 2619 | 9.80E+01 | 19.80 | 0.00E+00 | 0.00E+00 |

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

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 12:06:54PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 46.49 | 45 - | 49 | 46.84 | 9.45E+01 | 57.40 | 6.49E+02 | PB-210 |
| | 2 | 62.53 | 59 - | 65 | 62.86 | 1.47E+02 | 89.78 | 1.37E+03 | TH-230 |
| | | | | | | | | | TH-234 |
| | 3 | 76.22 | 72 - | 83 | 76.53 | 8.26E+02 | 157.75 | 2.67E+03 | ..... |
| | 4 | 92.26 | 89 - | 96 | 92.56 | 2.85E+02 | 104.92 | 1.58E+03 | ..... |
| | 5 | 162.96 | 159 - | 168 | 163.18 | 1.34E+02 | 85.81 | 9.77E+02 | BA-140 |
| | | | | | | | | | U-235 |
| | | | | | | | | | CS-136 |
| | 6 | 185.86 | 183 - | 189 | 186.05 | 1.81E+02 | 66.21 | 6.66E+02 | RA-226 |
| | 7 | 209.43 | 207 - | 213 | 209.59 | 7.30E+01 | 60.02 | 6.02E+02 | CM-243 |
| | | | | | | | | | GA-67 |
| | 8 | 219.57 | 217 - | 222 | 219.72 | 4.39E+01 | 51.88 | 5.02E+02 | ..... |
| M | 9 | 238.74 | 234 - | 247 | 238.87 | 6.92E+02 | 65.24 | 3.04E+02 | PB-212 |
| m | 10 | 242.09 | 234 - | 247 | 242.23 | 1.08E+02 | 44.81 | 2.78E+02 | ..... |
| | 11 | 270.10 | 267 - | 274 | 270.20 | 6.15E+01 | 57.38 | 4.99E+02 | ..... |
| | 12 | 277.27 | 274 - | 280 | 277.37 | 3.81E+01 | 47.19 | 3.76E+02 | CM-243 |
| | | | | | | | | | NP-239 |
| M | 13 | 295.02 | 290 - | 303 | 295.10 | 2.15E+02 | 45.49 | 2.52E+02 | PB-214 |
| m | 14 | 300.66 | 290 - | 303 | 300.73 | 5.10E+01 | 36.57 | 2.25E+02 | GA-67 |
| | | | | | | | | | PB-212 |
| | | | | | | | | | BI-210M |
| | 15 | 305.94 | 304 - | 309 | 306.01 | 4.16E+01 | 37.74 | 2.51E+02 | LU-176 |
| | 16 | 313.27 | 310 - | 316 | 313.33 | 4.10E+01 | 42.92 | 3.06E+02 | ..... |
| | 17 | 328.29 | 325 - | 332 | 328.34 | 6.92E+01 | 49.72 | 3.62E+02 | LA-140 |
| | 18 | 338.64 | 334 - | 343 | 338.67 | 1.31E+02 | 61.49 | 4.65E+02 | AC-228 |
| | 19 | 351.87 | 347 - | 355 | 351.89 | 4.16E+02 | 64.41 | 3.83E+02 | PB-214 |
| | 20 | 409.40 | 407 - | 412 | 409.36 | 2.69E+01 | 33.42 | 1.94E+02 | ..... |
| | 21 | 472.83 | 470 - | 476 | 472.72 | 2.61E+01 | 29.77 | 1.46E+02 | SB-127 |
| | 22 | 510.95 | 506 - | 516 | 510.81 | 1.69E+02 | 48.27 | 2.21E+02 | ..... |
| | 23 | 583.12 | 578 - | 587 | 582.90 | 2.29E+02 | 48.12 | 2.01E+02 | TL-208 |
| | 24 | 609.39 | 605 - | 613 | 609.14 | 2.98E+02 | 49.26 | 1.91E+02 | BI-214 |
| | 25 | 663.38 | 658 - | 667 | 663.08 | 3.44E+01 | 36.41 | 1.69E+02 | ..... |
| | 26 | 727.44 | 724 - | 731 | 727.08 | 3.17E+01 | 36.11 | 1.97E+02 | BI-212 |
| | 27 | 745.65 | 741 - | 749 | 745.27 | 4.48E+01 | 29.22 | 1.04E+02 | ..... |
| | 28 | 769.02 | 764 - | 773 | 768.62 | 2.85E+01 | 34.68 | 1.57E+02 | ..... |
| | 29 | 784.34 | 780 - | 788 | 783.93 | 5.17E+01 | 24.89 | 6.46E+01 | SB-127 |
| | 30 | 795.55 | 791 - | 800 | 795.12 | 3.69E+01 | 34.07 | 1.44E+02 | CS-134 |
| | 31 | 840.68 | 832 - | 848 | 840.21 | 6.00E+01 | 46.88 | 1.84E+02 | ..... |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 32 | 861.40 | 856 - | 865 | 860.91 | 5.16E+01 | 32.88 | 1.25E+02 | ..... |
| | 33 | 911.68 | 905 - | 915 | 911.14 | 1.43E+02 | 42.06 | 1.61E+02 | TL-204<br>AC-228 |
| M | 34 | 965.39 | 962 - | 973 | 964.80 | 3.37E+01 | 19.42 | 6.36E+01 | ..... |
| m | 35 | 969.39 | 962 - | 973 | 968.80 | 1.08E+02 | 30.48 | 6.45E+01 | AC-228 |
| | 36 | 978.18 | 974 - | 981 | 977.58 | 1.65E+01 | 20.69 | 6.10E+01 | ..... |
| | 37 | 1088.94 | 1086 - | 1091 | 1088.24 | 1.58E+01 | 17.80 | 5.04E+01 | ..... |
| | 38 | 1103.59 | 1100 - | 1107 | 1102.88 | 2.00E+01 | 22.36 | 6.60E+01 | ..... |
| | 39 | 1120.91 | 1116 - | 1124 | 1120.18 | 3.85E+01 | 33.95 | 1.55E+02 | TA-182<br>SC-46<br>BI-214 |
| | 40 | 1353.00 | 1348 - | 1359 | 1352.07 | 1.98E+01 | 16.61 | 2.63E+01 | ..... |
| M | 41 | 1378.35 | 1373 - | 1387 | 1377.39 | 2.25E+01 | 16.12 | 2.74E+01 | ..... |
| m | 42 | 1385.47 | 1373 - | 1387 | 1384.51 | 1.67E+01 | 14.97 | 1.93E+01 | ..... |
| | 43 | 1461.31 | 1454 - | 1466 | 1460.29 | 7.30E+02 | 58.88 | 6.24E+01 | K-40 |
| | 44 | 1481.32 | 1477 - | 1484 | 1480.28 | 8.00E+00 | 8.94 | 8.00E+00 | ..... |
| | 45 | 1495.79 | 1489 - | 1499 | 1494.74 | 1.61E+01 | 16.35 | 2.59E+01 | ..... |
| | 46 | 1510.17 | 1506 - | 1513 | 1509.10 | 1.45E+01 | 11.31 | 1.09E+01 | ..... |
| | 47 | 1578.19 | 1568 - | 1585 | 1577.07 | 4.20E+01 | 12.96 | 0.00E+00 | ..... |
| | 48 | 1590.61 | 1585 - | 1594 | 1589.47 | 2.07E+01 | 18.08 | 3.47E+01 | ..... |
| | 49 | 1716.98 | 1712 - | 1718 | 1715.75 | 6.25E+00 | 6.65 | 3.50E+00 | ..... |
| | 50 | 1730.41 | 1723 - | 1735 | 1729.16 | 1.46E+01 | 14.92 | 1.89E+01 | ..... |
| | 51 | 1764.96 | 1760 - | 1767 | 1763.69 | 7.22E+01 | 17.66 | 3.66E+00 | BI-214 |
| | 52 | 1859.78 | 1854 - | 1863 | 1858.44 | 1.60E+01 | 8.00 | 0.00E+00 | ..... |
| | 53 | 2193.09 | 2188 - | 2194 | 2191.51 | 8.30E+00 | 7.23 | 3.40E+00 | ..... |
| | 54 | 2204.76 | 2196 - | 2208 | 2203.17 | 2.05E+01 | 15.71 | 1.90E+01 | BI-214 |
| | 55 | 2614.93 | 2607 - | 2619 | 2613.06 | 9.80E+01 | 19.80 | 0.00E+00 | TL-208 |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 12:06:54PM

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 1 | 46.49 | 9.45E+01 | 57.40 | 1.58E-02 | 1.67E-03 |
| 2 | 62.53 | 1.47E+02 | 89.78 | 2.36E-02 | 1.75E-03 |
| 3 | 76.22 | 8.26E+02 | 157.75 | 2.63E-02 | 2.11E-03 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 4 | 92.26 | 2.85E+02 | 104.92 | 2.70E-02 | 2.34E-03 |
| | 5 | 162.96 | 1.34E+02 | 85.81 | 2.20E-02 | 1.63E-03 |
| | 6 | 185.86 | 1.81E+02 | 66.21 | 2.03E-02 | 1.53E-03 |
| | 7 | 209.43 | 7.30E+01 | 60.02 | 1.88E-02 | 1.43E-03 |
| | 8 | 219.57 | 4.39E+01 | 51.88 | 1.82E-02 | 1.38E-03 |
| M | 9 | 238.74 | 6.92E+02 | 65.24 | 1.72E-02 | 1.30E-03 |
| m | 10 | 242.09 | 1.08E+02 | 44.81 | 1.71E-02 | 1.28E-03 |
| | 11 | 270.10 | 6.15E+01 | 57.38 | 1.58E-02 | 1.16E-03 |
| | 12 | 277.27 | 3.81E+01 | 47.19 | 1.55E-02 | 1.13E-03 |
| M | 13 | 295.02 | 2.15E+02 | 45.49 | 1.48E-02 | 1.10E-03 |
| m | 14 | 300.66 | 5.10E+01 | 36.57 | 1.46E-02 | 1.09E-03 |
| | 15 | 305.94 | 4.16E+01 | 37.74 | 1.45E-02 | 1.08E-03 |
| | 16 | 313.27 | 4.10E+01 | 42.92 | 1.42E-02 | 1.07E-03 |
| | 17 | 328.29 | 6.92E+01 | 49.72 | 1.37E-02 | 1.05E-03 |
| | 18 | 338.64 | 1.31E+02 | 61.49 | 1.34E-02 | 1.04E-03 |
| | 19 | 351.87 | 4.16E+02 | 64.41 | 1.31E-02 | 1.02E-03 |
| | 20 | 409.40 | 2.69E+01 | 33.42 | 1.17E-02 | 9.53E-04 |
| | 21 | 472.83 | 2.61E+01 | 29.77 | 1.05E-02 | 8.98E-04 |
| | 22 | 510.95 | 1.69E+02 | 48.27 | 9.87E-03 | 8.65E-04 |
| | 23 | 583.12 | 2.29E+02 | 48.12 | 8.91E-03 | 8.02E-04 |
| | 24 | 609.39 | 2.98E+02 | 49.26 | 8.60E-03 | 7.79E-04 |
| | 25 | 663.38 | 3.44E+01 | 36.41 | 8.04E-03 | 7.32E-04 |
| | 26 | 727.44 | 3.17E+01 | 36.11 | 7.46E-03 | 6.71E-04 |
| | 27 | 745.65 | 4.48E+01 | 29.22 | 7.32E-03 | 6.53E-04 |
| | 28 | 769.02 | 2.85E+01 | 34.68 | 7.14E-03 | 6.31E-04 |
| | 29 | 784.34 | 5.17E+01 | 24.89 | 7.02E-03 | 6.16E-04 |
| | 30 | 795.55 | 3.69E+01 | 34.07 | 6.94E-03 | 6.05E-04 |
| | 31 | 840.68 | 6.00E+01 | 46.88 | 6.63E-03 | 5.61E-04 |
| | 32 | 861.40 | 5.16E+01 | 32.88 | 6.50E-03 | 5.41E-04 |
| | 33 | 911.68 | 1.43E+02 | 42.06 | 6.21E-03 | 5.01E-04 |
| M | 34 | 965.39 | 3.37E+01 | 19.42 | 5.92E-03 | 4.83E-04 |
| m | 35 | 969.39 | 1.08E+02 | 30.48 | 5.90E-03 | 4.81E-04 |
| | 36 | 978.18 | 1.65E+01 | 20.69 | 5.86E-03 | 4.78E-04 |
| | 37 | 1088.94 | 1.58E+01 | 17.80 | 5.37E-03 | 4.40E-04 |
| | 38 | 1103.59 | 2.00E+01 | 22.36 | 5.31E-03 | 4.34E-04 |
| | 39 | 1120.91 | 3.85E+01 | 33.95 | 5.24E-03 | 4.28E-04 |
| | 40 | 1353.00 | 1.98E+01 | 16.61 | 4.52E-03 | 4.19E-04 |
| M | 41 | 1378.35 | 2.25E+01 | 16.12 | 4.45E-03 | 4.11E-04 |
| m | 42 | 1385.47 | 1.67E+01 | 14.97 | 4.44E-03 | 4.09E-04 |
| | 43 | 1461.31 | 7.30E+02 | 58.88 | 4.26E-03 | 3.87E-04 |
| | 44 | 1481.32 | 8.00E+00 | 8.94 | 4.22E-03 | 3.82E-04 |
| | 45 | 1495.79 | 1.61E+01 | 16.35 | 4.19E-03 | 3.78E-04 |
| | 46 | 1510.17 | 1.45E+01 | 11.31 | 4.16E-03 | 3.73E-04 |
| | 47 | 1578.19 | 4.20E+01 | 12.96 | 4.03E-03 | 3.54E-04 |
| | 48 | 1590.61 | 2.07E+01 | 18.08 | 4.01E-03 | 3.50E-04 |
| | 49 | 1716.98 | 6.25E+00 | 6.65 | 3.81E-03 | 3.14E-04 |
| | 50 | 1730.41 | 1.46E+01 | 14.92 | 3.79E-03 | 3.10E-04 |
| | 51 | 1764.96 | 7.22E+01 | 17.66 | 3.75E-03 | 3.00E-04 |
| | 52 | 1859.78 | 1.60E+01 | 8.00 | 3.63E-03 | 2.79E-04 |
| | 53 | 2193.09 | 8.30E+00 | 7.23 | 3.35E-03 | 2.79E-04 |
| | 54 | 2204.76 | 2.05E+01 | 15.71 | 3.34E-03 | 2.79E-04 |
| | 55 | 2614.93 | 9.80E+01 | 19.80 | 3.20E-03 | 2.79E-04 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 12:06:54PM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055574.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 46.49 | 9.45E+01 | 57.40 | 3.74E+01 | 5.77E+00 | 5.71E+01 | 5.77E+01 |
| | 2 | 62.53 | 1.47E+02 | 89.78 | 6.29E+01 | 1.34E+01 | 8.42E+01 | 9.08E+01 |
| | 3 | 76.22 | 8.26E+02 | 157.75 | | | 8.26E+02 | 1.58E+02 |
| | 4 | 92.26 | 2.85E+02 | 104.92 | 4.88E+01 | 1.30E+00 | 2.36E+02 | 1.05E+02 |
| | 5 | 162.96 | 1.34E+02 | 85.81 | | | 1.34E+02 | 8.58E+01 |
| | 6 | 185.86 | 1.81E+02 | 66.21 | 3.48E+01 | 7.32E+00 | 1.46E+02 | 6.66E+01 |
| | 7 | 209.43 | 7.30E+01 | 60.02 | | | 7.30E+01 | 6.00E+01 |
| | 8 | 219.57 | 4.39E+01 | 51.88 | | | 4.39E+01 | 5.19E+01 |
| M | 9 | 238.74 | 6.92E+02 | 65.24 | 7.09E+00 | 6.85E+00 | 6.85E+02 | 6.56E+01 |
| m | 10 | 242.09 | 1.08E+02 | 44.81 | | | 1.08E+02 | 4.48E+01 |
| | 11 | 270.10 | 6.15E+01 | 57.38 | | | 6.15E+01 | 5.74E+01 |
| | 12 | 277.27 | 3.81E+01 | 47.19 | | | 3.81E+01 | 4.72E+01 |
| M | 13 | 295.02 | 2.15E+02 | 45.49 | | | 2.15E+02 | 4.55E+01 |
| m | 14 | 300.66 | 5.10E+01 | 36.57 | | | 5.10E+01 | 3.66E+01 |
| | 15 | 305.94 | 4.16E+01 | 37.74 | | | 4.16E+01 | 3.77E+01 |
| | 16 | 313.27 | 4.10E+01 | 42.92 | | | 4.10E+01 | 4.29E+01 |
| | 17 | 328.29 | 6.92E+01 | 49.72 | | | 6.92E+01 | 4.97E+01 |
| | 18 | 338.64 | 1.31E+02 | 61.49 | | | 1.31E+02 | 6.15E+01 |
| | 19 | 351.87 | 4.16E+02 | 64.41 | 1.04E+01 | 5.08E+00 | 4.05E+02 | 6.46E+01 |
| | 20 | 409.40 | 2.69E+01 | 33.42 | | | 2.69E+01 | 3.34E+01 |
| | 21 | 472.83 | 2.61E+01 | 29.77 | | | 2.61E+01 | 2.98E+01 |
| | 22 | 510.95 | 1.69E+02 | 48.27 | 7.08E+01 | 4.94E+00 | 9.86E+01 | 4.85E+01 |
| | 23 | 583.12 | 2.29E+02 | 48.12 | 5.65E+00 | 3.57E+00 | 2.23E+02 | 4.83E+01 |
| | 24 | 609.39 | 2.98E+02 | 49.26 | 1.07E+01 | 3.96E+00 | 2.88E+02 | 4.94E+01 |
| | 25 | 663.38 | 3.44E+01 | 36.41 | | | 3.44E+01 | 3.64E+01 |
| | 26 | 727.44 | 3.17E+01 | 36.11 | | | 3.17E+01 | 3.61E+01 |
| | 27 | 745.65 | 4.48E+01 | 29.22 | | | 4.48E+01 | 2.92E+01 |
| | 28 | 769.02 | 2.85E+01 | 34.68 | | | 2.85E+01 | 3.47E+01 |
| | 29 | 784.34 | 5.17E+01 | 24.89 | | | 5.17E+01 | 2.49E+01 |
| | 30 | 795.55 | 3.69E+01 | 34.07 | | | 3.69E+01 | 3.41E+01 |
| | 31 | 840.68 | 6.00E+01 | 46.88 | | | 6.00E+01 | 4.69E+01 |
| | 32 | 861.40 | 5.16E+01 | 32.88 | | | 5.16E+01 | 3.29E+01 |
| | 33 | 911.68 | 1.43E+02 | 42.06 | 2.63E+00 | 2.49E+00 | 1.40E+02 | 4.21E+01 |
| M | 34 | 965.39 | 3.37E+01 | 19.42 | | | 3.37E+01 | 1.94E+01 |
| m | 35 | 969.39 | 1.08E+02 | 30.48 | | | 1.08E+02 | 3.05E+01 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 36 | 978.18 | 1.65E+01 | 20.69 | | | 1.65E+01 | 2.07E+01 |
| | 37 | 1088.94 | 1.58E+01 | 17.80 | | | 1.58E+01 | 1.78E+01 |
| | 38 | 1103.59 | 2.00E+01 | 22.36 | | | 2.00E+01 | 2.24E+01 |
| | 39 | 1120.91 | 3.85E+01 | 33.95 | 2.45E+00 | 2.38E+00 | 3.61E+01 | 3.40E+01 |
| | 40 | 1353.00 | 1.98E+01 | 16.61 | | | 1.98E+01 | 1.66E+01 |
| M | 41 | 1378.35 | 2.25E+01 | 16.12 | | | 2.25E+01 | 1.61E+01 |
| m | 42 | 1385.47 | 1.67E+01 | 14.97 | | | 1.67E+01 | 1.50E+01 |
| | 43 | 1461.31 | 7.30E+02 | 58.88 | 5.90E+00 | 2.63E+00 | 7.24E+02 | 5.89E+01 |
| | 44 | 1481.32 | 8.00E+00 | 8.94 | | | 8.00E+00 | 8.94E+00 |
| | 45 | 1495.79 | 1.61E+01 | 16.35 | | | 1.61E+01 | 1.63E+01 |
| | 46 | 1510.17 | 1.45E+01 | 11.31 | | | 1.45E+01 | 1.13E+01 |
| | 47 | 1578.19 | 4.20E+01 | 12.96 | | | 4.20E+01 | 1.30E+01 |
| | 48 | 1590.61 | 2.07E+01 | 18.08 | | | 2.07E+01 | 1.81E+01 |
| | 49 | 1716.98 | 6.25E+00 | 6.65 | | | 6.25E+00 | 6.65E+00 |
| | 50 | 1730.41 | 1.46E+01 | 14.92 | | | 1.46E+01 | 1.49E+01 |
| | 51 | 1764.96 | 7.22E+01 | 17.66 | 3.33E+00 | 1.73E+00 | 6.88E+01 | 1.77E+01 |
| | 52 | 1859.78 | 1.60E+01 | 8.00 | | | 1.60E+01 | 8.00E+00 |
| | 53 | 2193.09 | 8.30E+00 | 7.23 | | | 8.30E+00 | 7.23E+00 |
| | 54 | 2204.76 | 2.05E+01 | 15.71 | | | 2.05E+01 | 1.57E+01 |
| | 55 | 2614.93 | 9.80E+01 | 19.80 | 4.77E+00 | 1.52E+00 | 9.32E+01 | 1.99E+01 |

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 12:06:54PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055574.CNF

Corrected Area is: Original * Peak Ratio - Background

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 1 | 46.49 | 9.45E+01 | 57.40 | 3.74E+01 | 5.77E+00 | 5.71E+01 | 5.77E+01 |
| 2 | 62.53 | 1.47E+02 | 89.78 | 6.29E+01 | 1.34E+01 | 8.42E+01 | 9.08E+01 |
| 3 | 76.22 | 8.26E+02 | 157.75 | | | 8.26E+02 | 1.58E+02 |
| 4 | 92.26 | 2.85E+02 | 104.92 | 4.88E+01 | 1.30E+00 | 2.36E+02 | 1.05E+02 |
| 5 | 162.96 | 1.34E+02 | 85.81 | | | 1.34E+02 | 8.58E+01 |
| 6 | 185.86 | 1.81E+02 | 66.21 | 3.48E+01 | 7.32E+00 | 1.46E+02 | 6.66E+01 |
| 7 | 209.43 | 7.30E+01 | 60.02 | | | 7.30E+01 | 6.00E+01 |
| 8 | 219.57 | 4.39E+01 | 51.88 | | | 4.39E+01 | 5.19E+01 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| M | 9 | 238.74 | 6.92E+02 | 65.24 | 7.09E+00 | 6.85E+00 | 6.85E+02 | 6.56E+01 |
| m | 10 | 242.09 | 1.08E+02 | 44.81 | | | 1.08E+02 | 4.48E+01 |
| | 11 | 270.10 | 6.15E+01 | 57.38 | | | 6.15E+01 | 5.74E+01 |
| | 12 | 277.27 | 3.81E+01 | 47.19 | | | 3.81E+01 | 4.72E+01 |
| M | 13 | 295.02 | 2.15E+02 | 45.49 | | | 2.15E+02 | 4.55E+01 |
| m | 14 | 300.66 | 5.10E+01 | 36.57 | | | 5.10E+01 | 3.66E+01 |
| | 15 | 305.94 | 4.16E+01 | 37.74 | | | 4.16E+01 | 3.77E+01 |
| | 16 | 313.27 | 4.10E+01 | 42.92 | | | 4.10E+01 | 4.29E+01 |
| | 17 | 328.29 | 6.92E+01 | 49.72 | | | 6.92E+01 | 4.97E+01 |
| | 18 | 338.64 | 1.31E+02 | 61.49 | | | 1.31E+02 | 6.15E+01 |
| | 19 | 351.87 | 4.16E+02 | 64.41 | 1.04E+01 | 5.08E+00 | 4.05E+02 | 6.46E+01 |
| | 20 | 409.40 | 2.69E+01 | 33.42 | | | 2.69E+01 | 3.34E+01 |
| | 21 | 472.83 | 2.61E+01 | 29.77 | | | 2.61E+01 | 2.98E+01 |
| | 22 | 510.95 | 1.69E+02 | 48.27 | 7.08E+01 | 4.94E+00 | 9.86E+01 | 4.85E+01 |
| | 23 | 583.12 | 2.29E+02 | 48.12 | 5.65E+00 | 3.57E+00 | 2.23E+02 | 4.83E+01 |
| | 24 | 609.39 | 2.98E+02 | 49.26 | 1.07E+01 | 3.96E+00 | 2.88E+02 | 4.94E+01 |
| | 25 | 663.38 | 3.44E+01 | 36.41 | | | 3.44E+01 | 3.64E+01 |
| | 26 | 727.44 | 3.17E+01 | 36.11 | | | 3.17E+01 | 3.61E+01 |
| | 27 | 745.65 | 4.48E+01 | 29.22 | | | 4.48E+01 | 2.92E+01 |
| | 28 | 769.02 | 2.85E+01 | 34.68 | | | 2.85E+01 | 3.47E+01 |
| | 29 | 784.34 | 5.17E+01 | 24.89 | | | 5.17E+01 | 2.49E+01 |
| | 30 | 795.55 | 3.69E+01 | 34.07 | | | 3.69E+01 | 3.41E+01 |
| | 31 | 840.68 | 6.00E+01 | 46.88 | | | 6.00E+01 | 4.69E+01 |
| | 32 | 861.40 | 5.16E+01 | 32.88 | | | 5.16E+01 | 3.29E+01 |
| | 33 | 911.68 | 1.43E+02 | 42.06 | 2.63E+00 | 2.49E+00 | 1.40E+02 | 4.21E+01 |
| M | 34 | 965.39 | 3.37E+01 | 19.42 | | | 3.37E+01 | 1.94E+01 |
| m | 35 | 969.39 | 1.08E+02 | 30.48 | | | 1.08E+02 | 3.05E+01 |
| | 36 | 978.18 | 1.65E+01 | 20.69 | | | 1.65E+01 | 2.07E+01 |
| | 37 | 1088.94 | 1.58E+01 | 17.80 | | | 1.58E+01 | 1.78E+01 |
| | 38 | 1103.59 | 2.00E+01 | 22.36 | | | 2.00E+01 | 2.24E+01 |
| | 39 | 1120.91 | 3.85E+01 | 33.95 | 2.45E+00 | 2.38E+00 | 3.61E+01 | 3.40E+01 |
| | 40 | 1353.00 | 1.98E+01 | 16.61 | | | 1.98E+01 | 1.66E+01 |
| M | 41 | 1378.35 | 2.25E+01 | 16.12 | | | 2.25E+01 | 1.61E+01 |
| m | 42 | 1385.47 | 1.67E+01 | 14.97 | | | 1.67E+01 | 1.50E+01 |
| | 43 | 1461.31 | 7.30E+02 | 58.88 | 5.90E+00 | 2.63E+00 | 7.24E+02 | 5.89E+01 |
| | 44 | 1481.32 | 8.00E+00 | 8.94 | | | 8.00E+00 | 8.94E+00 |
| | 45 | 1495.79 | 1.61E+01 | 16.35 | | | 1.61E+01 | 1.63E+01 |
| | 46 | 1510.17 | 1.45E+01 | 11.31 | | | 1.45E+01 | 1.13E+01 |
| | 47 | 1578.19 | 4.20E+01 | 12.96 | | | 4.20E+01 | 1.30E+01 |
| | 48 | 1590.61 | 2.07E+01 | 18.08 | | | 2.07E+01 | 1.81E+01 |
| | 49 | 1716.98 | 6.25E+00 | 6.65 | | | 6.25E+00 | 6.65E+00 |
| | 50 | 1730.41 | 1.46E+01 | 14.92 | | | 1.46E+01 | 1.49E+01 |
| | 51 | 1764.96 | 7.22E+01 | 17.66 | 3.33E+00 | 1.73E+00 | 6.88E+01 | 1.77E+01 |
| | 52 | 1859.78 | 1.60E+01 | 8.00 | | | 1.60E+01 | 8.00E+00 |
| | 53 | 2193.09 | 8.30E+00 | 7.23 | | | 8.30E+00 | 7.23E+00 |
| | 54 | 2204.76 | 2.05E+01 | 15.71 | | | 2.05E+01 | 1.57E+01 |
| | 55 | 2614.93 | 9.80E+01 | 19.80 | 4.77E+00 | 1.52E+00 | 9.32E+01 | 1.99E+01 |

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

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.961 | 1460.81 | * | 10.67 | 1.86E+01 | 2.30E+00 |
| TL-208 | 0.884 | 583.14 | * | 30.22 | 9.65E-01 | 2.26E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 9.48E-01 | 2.18E-01 |
| PB-210 | 1.000 | 46.50 | * | 4.25 | 9.97E-01 | 1.01E+00 |
| BI-212 | 0.759 | 727.17 | * | 11.80 | 4.19E-01 | 4.79E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.995 | 238.63 | * | 44.60 | 1.04E+00 | 1.27E-01 |
| | | 300.09 | * | 3.41 | 1.19E+00 | 8.57E-01 |
| BI-214 | 0.979 | 609.31 | * | 46.30 | 8.42E-01 | 1.64E-01 |
| | | 1120.29 | * | 15.10 | 5.31E-01 | 5.03E-01 |
| | | 1764.49 | * | 15.80 | 1.36E+00 | 3.66E-01 |
| | | 2204.22 | * | 4.98 | 1.44E+00 | 1.11E+00 |
| PB-214 | 0.998 | 295.21 | * | 19.19 | 8.79E-01 | 1.97E-01 |
| | | 351.92 | * | 37.19 | 9.72E-01 | 1.73E-01 |
| RA-226 | 0.980 | 186.21 | * | 3.28 | 2.56E+00 | 4.82E+00 |
| AC-228 | 0.964 | 338.32 | * | 11.40 | 9.98E-01 | 4.74E-01 |
| | | 911.07 | * | 27.70 | 9.49E-01 | 2.96E-01 |
| | | 969.11 | * | 16.60 | 1.29E+00 | 3.77E-01 |
| TH-234 | 0.912 | 63.29 | * | 3.80 | 1.10E+00 | 1.18E+00 |
| CM-243 | 0.363 | 209.75 | * | 3.29 | 1.38E+00 | 1.14E+00 |
| | | 228.14 | | 10.60 | | |
| | | 277.60 | * | 14.00 | 2.06E-01 | 2.55E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 12:06:54PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 3 | 76.22 | 2.29338E-01 | 9.55 | | |
| | 4 | 92.26 | 6.55028E-02 | 22.25 | Sum | |
| | 5 | 162.96 | 3.71501E-02 | 32.08 | Tol. | BA-140<br>U-235 |
| | 8 | 219.57 | 1.22081E-02 | 59.03 | | |
| m | 10 | 242.09 | 2.98783E-02 | 20.83 | | |
| | 11 | 270.10 | 1.70865E-02 | 46.64 | | |
| | 15 | 305.94 | 1.15669E-02 | 45.31 | Tol. | LU-176 |
| | 16 | 313.27 | 1.13824E-02 | 52.37 | | |
| | 17 | 328.29 | 1.92111E-02 | 35.95 | Tol. | LA-140 |
| | 20 | 409.40 | 7.46528E-03 | 62.18 | | |
| | 21 | 472.83 | 7.25589E-03 | 56.98 | Tol. | SB-127 |
| | 22 | 510.95 | 2.73784E-02 | 24.62 | Sum | |
| | 25 | 663.38 | 9.55416E-03 | 52.94 | | |
| | 27 | 745.65 | 1.24384E-02 | 32.63 | | |
| | 28 | 769.02 | 7.90369E-03 | 60.95 | Sum | |
| | 29 | 784.34 | 1.43585E-02 | 24.08 | Tol. | SB-127 |
| | 30 | 795.55 | 1.02472E-02 | 46.18 | Sum | |
| | 31 | 840.68 | 1.66630E-02 | 39.07 | | |
| | 32 | 861.40 | 1.43470E-02 | 31.83 | | |
| M | 34 | 965.39 | 9.36844E-03 | 28.79 | Sum | |
| | 36 | 978.18 | 4.58038E-03 | 62.73 | | |
| | 37 | 1088.94 | 4.38347E-03 | 56.41 | | |
| | 38 | 1103.59 | 5.55556E-03 | 55.90 | | |
| | 40 | 1353.00 | 5.51347E-03 | 41.85 | | |
| M | 41 | 1378.35 | 6.26116E-03 | 35.77 | | |
| m | 42 | 1385.47 | 4.64869E-03 | 44.72 | | |
| | 44 | 1481.32 | 2.22222E-03 | 55.90 | | |
| | 45 | 1495.79 | 4.45881E-03 | 50.92 | Sum | |
| | 46 | 1510.17 | 4.03472E-03 | 38.95 | | |
| | 47 | 1578.19 | 1.16667E-02 | 15.43 | Sum | |
| | 48 | 1590.61 | 5.74196E-03 | 43.74 | | |
| | 49 | 1716.98 | 1.73611E-03 | 53.22 | | |
| | 50 | 1730.41 | 4.04514E-03 | 51.24 | Sum | |
| | 52 | 1859.78 | 4.44444E-03 | 25.00 | | |
| | 53 | 2193.09 | 2.30556E-03 | 43.54 | | |

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

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.96 | 1460.81 | * | 10.67 | 1.86E+01 | 2.30E+00 |
| TL-208 | 0.88 | 583.14 | * | 30.22 | 9.65E-01 | 2.26E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 9.48E-01 | 2.18E-01 |
| PB-210 | 1.00 | 46.50 | * | 4.25 | 9.97E-01 | 1.01E+00 |
| BI-212 | 0.75 | 727.17 | * | 11.80 | 4.19E-01 | 4.79E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.99 | 238.63 | * | 44.60 | 1.04E+00 | 1.27E-01 |
| | | 300.09 | * | 3.41 | 1.19E+00 | 8.57E-01 |
| BI-214 | 0.97 | 609.31 | * | 46.30 | 8.42E-01 | 1.64E-01 |
| | | 1120.29 | * | 15.10 | 5.31E-01 | 5.03E-01 |
| | | 1764.49 | * | 15.80 | 1.36E+00 | 3.66E-01 |
| | | 2204.22 | * | 4.98 | 1.44E+00 | 1.11E+00 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 8.79E-01 | 1.97E-01 |
| | | 351.92 | * | 37.19 | 9.72E-01 | 1.73E-01 |
| RA-226 | 0.98 | 186.21 | * | 3.28 | 2.56E+00 | 4.82E+00 |
| AC-228 | 0.96 | 338.32 | * | 11.40 | 9.98E-01 | 4.74E-01 |
| | | 911.07 | * | 27.70 | 9.49E-01 | 2.96E-01 |
| | | 969.11 | * | 16.60 | 1.29E+00 | 3.77E-01 |
| TH-234 | 0.91 | 63.29 | * | 3.80 | 1.10E+00 | 1.18E+00 |
| CM-243 | 0.36 | 209.75 | * | 3.29 | 1.38E+00 | 1.14E+00 |
| | | 228.14 | | 10.60 | | |
| | | 277.60 | * | 14.00 | 2.06E-01 | 2.55E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| K-40 | 0.961 | 1.86E+01 | 2.30E+00 | |
| TL-208 | 0.884 | 9.56E-01 | 1.57E-01 | |
| PB-210 | 1.000 | 9.97E-01 | 1.01E+00 | |
| BI-212 | 0.759 | 4.19E-01 | 4.79E-01 | |
| PB-212 | 0.995 | 1.04E+00 | 1.25E-01 | |
| BI-214 | 0.979 | 9.04E-01 | 1.42E-01 | |
| PB-214 | 0.998 | 9.31E-01 | 1.30E-01 | |
| RA-226 | 0.980 | 2.56E+00 | 4.82E+00 | |
| AC-228 | 0.964 | 1.06E+00 | 2.09E-01 | |
| TH-234 | 0.912 | 1.10E+00 | 1.18E+00 | |
| CM-243 | 0.363 | 2.62E-01 | 2.49E-01 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 12:06:54PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 3 | 76.22 | 2.29338E-01 | 9.55 | | |
| | 4 | 92.26 | 6.55028E-02 | 22.25 | Sum | |
| | 5 | 162.96 | 3.71501E-02 | 32.08 | Tol. | BA-140<br>U-235 |
| | 8 | 219.57 | 1.22081E-02 | 59.03 | | |
| m | 10 | 242.09 | 2.98783E-02 | 20.83 | | |
| | 11 | 270.10 | 1.70865E-02 | 46.64 | | |
| | 15 | 305.94 | 1.15669E-02 | 45.31 | Tol. | LU-176 |
| | 16 | 313.27 | 1.13824E-02 | 52.37 | | |
| | 17 | 328.29 | 1.92111E-02 | 35.95 | Tol. | LA-140 |
| | 20 | 409.40 | 7.46528E-03 | 62.18 | | |
| | 21 | 472.83 | 7.25589E-03 | 56.98 | Tol. | SB-127 |
| | 22 | 510.95 | 2.73784E-02 | 24.62 | Sum | |
| | 25 | 663.38 | 9.55416E-03 | 52.94 | | |
| | 27 | 745.65 | 1.24384E-02 | 32.63 | | |
| | 28 | 769.02 | 7.90369E-03 | 60.95 | Sum | |
| | 29 | 784.34 | 1.43585E-02 | 24.08 | Tol. | SB-127 |
| | 30 | 795.55 | 1.02472E-02 | 46.18 | Sum | |
| | 31 | 840.68 | 1.66630E-02 | 39.07 | | |
| | 32 | 861.40 | 1.43470E-02 | 31.83 | | |
| M | 34 | 965.39 | 9.36844E-03 | 28.79 | Sum | |
| | 36 | 978.18 | 4.58038E-03 | 62.73 | | |
| | 37 | 1088.94 | 4.38347E-03 | 56.41 | | |
| | 38 | 1103.59 | 5.55556E-03 | 55.90 | | |
| | 40 | 1353.00 | 5.51347E-03 | 41.85 | | |
| M | 41 | 1378.35 | 6.26116E-03 | 35.77 | | |
| m | 42 | 1385.47 | 4.64869E-03 | 44.72 | | |
| | 44 | 1481.32 | 2.22222E-03 | 55.90 | | |
| | 45 | 1495.79 | 4.45881E-03 | 50.92 | Sum | |
| | 46 | 1510.17 | 4.03472E-03 | 38.95 | | |
| | 47 | 1578.19 | 1.16667E-02 | 15.43 | Sum | |
| | 48 | 1590.61 | 5.74196E-03 | 43.74 | | |
| | 49 | 1716.98 | 1.73611E-03 | 53.22 | | |
| | 50 | 1730.41 | 4.04514E-03 | 51.24 | Sum | |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 52 | 1859.78 | 4.44444E-03 | 25.00 | | |
| 53 | 2193.09 | 2.30556E-03 | 43.54 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | 9.35E-02 | 1.59E+00 | 1.59E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | -2.43E-02 | 7.58E-02 | 7.58E-02 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | -1.42E-02 | 5.28E-02 | 5.28E-02 |
| + | | K-40 | 1460.81 | * | 10.67 | 1.86E+01 | 1.08E+00 | 1.08E+00 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | 3.01E-03 | 4.55E-02 | 4.55E-02 |
| | | | 78.34 | | 96.00 | 5.08E-02 | | 5.20E-02 |
| + | | SC-46 | 889.25 | | 99.98 | -4.60E-02 | 1.50E-01 | 1.50E-01 |
| | | | 1120.51 | | 99.99 | 2.36E-01 | | 2.57E-01 |
| + | | V-48 | 983.52 | | 99.98 | -1.04E+00 | 4.60E+00 | 4.60E+00 |
| | | | 1312.10 | | 97.50 | -2.85E+00 | | 5.41E+00 |
| + | | CR-51 | 320.08 | | 9.83 | 2.84E+00 | 5.61E+00 | 5.61E+00 |
| + | | MN-54 | 834.83 | | 99.97 | 1.72E-02 | 8.69E-02 | 8.69E-02 |
| + | | CO-56 | 846.75 | | 99.96 | 6.80E-02 | 1.63E-01 | 1.63E-01 |
| | | | 1037.75 | | 14.03 | 5.66E-01 | | 1.34E+00 |
| | | | 1238.25 | | 67.00 | 8.73E-02 | | 3.56E-01 |
| | | | 1771.40 | | 15.51 | -8.51E-01 | | 6.79E-01 |
| | | | 2598.48 | | 16.90 | -3.10E-01 | | 6.77E-01 |
| + | | CO-57 | 122.06 | | 85.51 | -2.74E-03 | 4.81E-02 | 4.81E-02 |
| | | | 136.48 | | 10.60 | -1.94E-01 | | 5.02E-01 |
| + | | CO-58 | 810.76 | | 99.40 | -9.71E-02 | 1.49E-01 | 1.49E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | 3.31E-02 | 6.62E-01 | 6.62E-01 |
| | | | 1291.56 | | 43.20 | -3.71E-02 | | 7.47E-01 |
| + | | CO-60 | 1173.22 | | 100.00 | -7.73E-03 | 6.86E-02 | 9.12E-02 |
| | | | 1332.49 | | 100.00 | -1.72E-02 | | 6.86E-02 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | ZN-65 | 1115.52 | 50.75 | -4.36E-02 | 2.08E-01 | 2.08E-01 |
| + | GA-67 | 93.31 | 35.70 | 3.34E+08 | 1.80E+08 | 1.80E+08 |
| | | 208.95 | 2.24 | 2.25E+09 | | 3.24E+09 |
| | | 300.22 | 16.00 | 4.52E+08 | | 4.67E+08 |
| + | SE-75 | 121.11 | 16.70 | -1.81E-01 | 1.25E-01 | 3.22E-01 |
| | | 136.00 | 59.20 | -3.54E-02 | | 1.25E-01 |
| | | 264.65 | 59.80 | -3.55E-02 | | 1.35E-01 |
| | | 279.53 | 25.20 | 6.16E-02 | | 3.31E-01 |
| | | 400.65 | 11.40 | -4.38E-01 | | 7.09E-01 |
| + | RB-82 | 776.52 | 13.00 | -1.22E+00 | 6.47E+00 | 6.47E+00 |
| + | RB-83 | 520.41 | 46.00 | -8.93E-02 | 2.11E-01 | 2.11E-01 |
| | | 529.64 | 30.30 | 1.46E-02 | | 3.23E-01 |
| | | 552.65 | 16.40 | -1.56E-01 | | 6.48E-01 |
| + | KR-85 | 513.99 | 0.43 | -1.28E+01 | 1.31E+01 | 1.31E+01 |
| + | SR-85 | 513.99 | 99.27 | -1.59E-01 | 1.63E-01 | 1.63E-01 |
| + | Y-88 | 898.02 | 93.40 | 3.51E-02 | 1.19E-01 | 1.50E-01 |
| | | 1836.01 | 99.38 | 4.51E-02 | | 1.19E-01 |
| + | MO-93 | 263.06 | 56.72 | -1.30E-02 | 5.51E-02 | 7.96E-02 |
| | | 684.67 | 99.68 | -4.01E-02 | | 5.69E-02 |
| | | 1477.11 | 99.08 | 1.07E-02 | | 5.51E-02 |
| + | NB-93M | 16.57 | 9.43 | 0.00E+00 | 6.81E+00 | 6.81E+00 |
| + | NB-94 | 702.63 | 100.00 | 2.53E-02 | 6.13E-02 | 7.00E-02 |
| | | 871.10 | 100.00 | -3.62E-03 | | 6.13E-02 |
| + | NB-95 | 765.79 | 99.81 | 3.12E-02 | 4.80E-01 | 4.80E-01 |
| + | NB-95M | 235.69 | 25.00 | -3.72E+08 | 5.01E+07 | 5.01E+07 |
| + | ZR-95 | 724.18 | 43.70 | 4.91E-03 | 3.51E-01 | 5.37E-01 |
| | | 756.72 | 55.30 | 1.11E-01 | | 3.51E-01 |
| + | MO-99 | 181.06 | 6.20 | 3.28E+10 | 3.01E+10 | 5.24E+10 |
| | | 739.58 | 12.80 | -8.31E+09 | | 3.01E+10 |
| | | 778.00 | 4.50 | -1.66E+10 | | 8.54E+10 |
| + | RU-103 | 497.08 | 89.00 | 1.16E-01 | 3.17E-01 | 3.17E-01 |
| + | RU-106 | 621.84 | 9.80 | -3.47E-01 | 6.91E-01 | 6.91E-01 |
| + | AG-108M | 433.93 | 89.90 | -5.09E-04 | 5.41E-02 | 5.41E-02 |
| | | 614.37 | 90.40 | -3.12E-03 | | 6.93E-02 |
| | | 722.95 | 90.50 | 6.26E-03 | | 7.88E-02 |
| + | CD-109 | 88.03 | 3.72 | 2.13E+00 | 1.38E+00 | 1.38E+00 |
| + | AG-110M | 657.75 | 93.14 | 7.24E-03 | 7.95E-02 | 7.95E-02 |
| | | 677.61 | 10.53 | 2.29E-01 | | 7.68E-01 |
| | | 706.67 | 16.46 | -1.62E-01 | | 5.38E-01 |
| | | 763.93 | 21.98 | -4.87E-03 | | 3.68E-01 |
| | | 884.67 | 71.63 | -6.14E-02 | | 1.21E-01 |
| | | 1384.27 | 23.94 | 4.47E-02 | | 4.13E-01 |
| + | CD-113M | 263.70 | 0.02 | -1.23E+02 | 1.94E+02 | 1.94E+02 |
| + | SN-113 | 255.12 | 1.93 | 2.31E+00 | 1.33E-01 | 4.36E+00 |
| | | 391.69 | 64.90 | 2.28E-02 | | 1.33E-01 |
| + | TE123M | 159.00 | 84.10 | 1.92E-02 | 9.06E-02 | 9.06E-02 |
| + | SB-124 | 602.71 | 97.87 | 3.03E-02 | 1.87E-01 | 1.87E-01 |
| | | 645.85 | 7.26 | 1.62E+00 | | 2.70E+00 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | SB-124 | 722.78 | 11.10 | 1.16E-01 | 1.87E-01 | 1.92E+00 |
| | | 1691.02 | 49.00 | 1.27E-01 | | 3.51E-01 |
| + | I-125 | 35.49 | 6.49 | -3.98E+01 | 6.24E+00 | 6.24E+00 |
| + | SB-125 | 176.33 | 6.89 | -2.14E-02 | 1.59E-01 | 6.84E-01 |
| | | 427.89 | 29.33 | -7.59E-02 | | 1.59E-01 |
| | | 463.38 | 10.35 | 2.32E-01 | | 5.63E-01 |
| | | 600.56 | 17.80 | 1.34E-01 | | 3.71E-01 |
| | | 635.90 | 11.32 | 7.42E-02 | | 5.33E-01 |
| + | SB-126 | 414.70 | 83.30 | 5.17E+00 | 1.43E+01 | 1.43E+01 |
| | | 666.33 | 99.60 | 8.12E-01 | | 1.71E+01 |
| | | 695.00 | 99.60 | -4.14E+00 | | 1.58E+01 |
| | | 720.50 | 53.80 | 3.29E-01 | | 3.14E+01 |
| + | SN-126 | 87.57 | 37.00 | 1.85E-01 | 1.20E-01 | 1.20E-01 |
| + | SB-127 | 473.00 | 25.00 | 8.23E+06 | 9.36E+06 | 1.17E+07 |
| | | 685.20 | 35.70 | -4.51E+06 | | 9.36E+06 |
| | | 783.80 | 14.70 | 2.68E+07 | | 2.74E+07 |
| + | I-129 | 29.78 | 57.00 | 6.70E-02 | 3.90E-01 | 3.90E-01 |
| | | 33.60 | 13.20 | 8.17E+00 | | 2.00E+00 |
| | | 39.58 | 7.52 | 1.04E+00 | | 1.18E+00 |
| + | I-131 | 284.30 | 6.05 | -2.13E+03 | 2.96E+02 | 3.71E+03 |
| | | 364.48 | 81.20 | 3.09E+01 | | 2.96E+02 |
| | | 636.97 | 7.26 | 1.54E+03 | | 4.04E+03 |
| | | 722.89 | 1.80 | 1.63E+03 | | 2.06E+04 |
| + | TE-132 | 49.72 | 13.10 | -2.82E+07 | 7.66E+07 | 5.08E+08 |
| | | 228.16 | 88.00 | 2.63E+07 | | 7.66E+07 |
| + | BA-133 | 81.00 | 33.00 | 6.39E-02 | 7.96E-02 | 1.14E-01 |
| | | 302.84 | 17.80 | -1.18E-01 | | 2.74E-01 |
| | | 356.01 | 60.00 | 2.57E-03 | | 7.96E-02 |
| + | @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | 38.00 | 2.72E+04 | 4.85E+04 | 4.85E+04 |
| + | CS-134 | 563.23 | 8.38 | 2.36E-01 | 6.50E-02 | 6.88E-01 |
| | | 569.32 | 15.43 | -1.27E-01 | | 3.51E-01 |
| | | 604.70 | 97.60 | -5.94E-03 | | 6.50E-02 |
| | | 795.84 | 85.40 | 7.87E-02 | | 9.93E-02 |
| | | 801.93 | 8.73 | -1.70E-02 | | 8.22E-01 |
| + | CS-135 | 268.24 | 16.00 | -1.97E-02 | 3.17E-01 | 3.17E-01 |
| + | @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | 7.46 | -1.27E+01 | 1.20E+01 | 1.08E+02 |
| | | 163.89 | 4.61 | 1.58E+01 | | 1.87E+02 |
| | | 176.55 | 13.56 | -1.90E+00 | | 6.05E+01 |
| | | 273.65 | 12.66 | -3.55E+01 | | 6.76E+01 |
| | | 340.57 | 48.50 | -9.46E+00 | | 2.22E+01 |
| | | 818.50 | 99.70 | 3.89E+00 | | 1.20E+01 |
| | | 1048.07 | 79.60 | 9.26E+00 | | 1.83E+01 |
| | | 1235.34 | 19.70 | 2.59E+01 | | 9.59E+01 |
| + | CS-137 | 661.65 | 85.12 | 1.22E-02 | 7.80E-02 | 7.80E-02 |
| + | LA-138 | 788.74 | 34.00 | -2.38E-02 | 9.40E-02 | 1.94E-01 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | LA-138 | 1435.80 | 66.00 | 2.02E-02 | 9.40E-02 | 9.40E-02 |
| + | CE-139 | 165.85 | 80.35 | 6.38E-02 | 9.22E-02 | 9.22E-02 |
| + | BA-140 | 162.64 | 6.70 | 6.35E+01 | 3.82E+01 | 1.52E+02 |
| | | 304.84 | 4.50 | 4.56E+01 | | 2.19E+02 |
| | | 423.70 | 3.20 | 1.31E+02 | | 3.21E+02 |
| | | 437.55 | 2.00 | 3.61E+01 | | 5.24E+02 |
| | | 537.32 | 25.00 | -2.70E+01 | | 3.82E+01 |
| + | LA-140 | 328.77 | 20.50 | 6.87E+01 | 1.55E+01 | 5.90E+01 |
| | | 487.03 | 45.50 | 6.58E+00 | | 2.24E+01 |
| | | 815.85 | 23.50 | -1.08E+01 | | 5.41E+01 |
| | | 1596.49 | 95.49 | 1.32E+00 | | 1.55E+01 |
| + | CE-141 | 145.44 | 48.40 | 1.92E-01 | 7.69E-01 | 7.69E-01 |
| + | @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | CE-144 | 133.54 | 10.80 | 3.24E-01 | 4.05E-01 | 4.05E-01 |
| + | PM-144 | 476.78 | 42.00 | 7.73E-03 | 7.13E-02 | 1.31E-01 |
| | | 618.01 | 98.60 | -1.05E-02 | | 7.13E-02 |
| | | 696.49 | 99.49 | 1.83E-03 | | 7.62E-02 |
| + | PM-145 | 36.85 | 21.70 | 6.35E-02 | 2.68E-01 | 5.20E-01 |
| | | 37.36 | 39.70 | -8.46E-02 | | 2.68E-01 |
| | | 42.30 | 15.10 | -7.43E-02 | | 4.14E-01 |
| | | 72.40 | 2.31 | -7.60E+00 | | 1.89E+00 |
| + | PM-146 | 453.90 | 39.94 | 3.61E-02 | 1.20E-01 | 1.20E-01 |
| | | 735.90 | 14.01 | -9.18E-02 | | 4.11E-01 |
| | | 747.13 | 13.10 | 2.09E-01 | | 5.58E-01 |
| + | ND-147 | 91.11 | 28.90 | -1.03E+02 | 7.86E+01 | 7.86E+01 |
| | | 531.02 | 13.10 | -5.96E+01 | | 1.72E+02 |
| + | PM-149 | 285.90 | 3.10 | -3.37E+12 | 4.53E+13 | 4.53E+13 |
| + | EU-152 | 121.78 | 20.50 | -8.97E-03 | 1.58E-01 | 1.58E-01 |
| | | 244.69 | 5.40 | -1.11E+00 | | 9.14E-01 |
| | | 344.27 | 19.13 | 6.34E-02 | | 2.46E-01 |
| | | 778.89 | 9.20 | -1.14E-01 | | 5.85E-01 |
| | | 964.01 | 10.40 | -1.08E-01 | | 8.14E-01 |
| | | 1085.78 | 7.22 | -2.35E-01 | | 1.00E+00 |
| | | 1112.02 | 9.60 | 6.14E-02 | | 7.99E-01 |
| | | 1407.95 | 14.94 | 3.41E-01 | | 5.53E-01 |
| + | GD-153 | 97.43 | 31.30 | -5.26E-02 | 1.32E-01 | 1.32E-01 |
| | | 103.18 | 22.20 | -2.12E-01 | | 1.69E-01 |
| + | EU-154 | 123.07 | 40.50 | 1.32E-02 | 8.31E-02 | 8.31E-02 |
| | | 723.30 | 19.70 | 2.93E-02 | | 3.70E-01 |
| | | 873.19 | 11.50 | 2.57E-02 | | 5.52E-01 |
| | | 996.32 | 10.30 | -5.00E-01 | | 6.13E-01 |
| | | 1004.76 | 17.90 | -1.25E-01 | | 4.17E-01 |
| | | 1274.45 | 35.50 | -6.49E-02 | | 2.03E-01 |
| + | EU-155 | 86.50 | 30.90 | 1.62E-01 | 1.48E-01 | 1.48E-01 |
| | | 105.30 | 20.70 | 7.12E-02 | | 1.68E-01 |
| + | EU-156 | 811.77 | 10.40 | -1.12E+01 | 5.21E+01 | 5.21E+01 |
| | | 1153.47 | 7.20 | -1.32E+01 | | 1.15E+02 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | EU-156 | 1230.71 | | 8.90 | -4.50E+01 | 5.21E+01 | 9.66E+01 |
| + | HO-166M | 184.41 | | 72.60 | 1.06E-01 | 7.59E-02 | 7.59E-02 |
| | | 280.45 | | 29.60 | 6.10E-02 | | 1.50E-01 |
| | | 410.94 | | 11.10 | 9.40E-02 | | 4.40E-01 |
| | | 711.69 | | 54.10 | 1.62E-02 | | 1.23E-01 |
| + | TM-171 | 66.72 | | 0.14 | 1.07E+01 | 3.42E+01 | 3.42E+01 |
| + | HF-172 | 67.35 | | 5.31 | 5.92E-02 | 3.29E-01 | 8.95E-01 |
| | | 125.81 | | 11.30 | -4.11E-02 | | 3.29E-01 |
| + | LU-172 | 181.53 | | 20.60 | 2.52E+03 | 3.11E+03 | 6.16E+03 |
| | | 900.72 | | 29.81 | 1.10E+03 | | 7.11E+03 |
| | | 1093.66 | | 62.50 | -5.61E+02 | | 3.11E+03 |
| + | LU-173 | 100.72 | | 5.24 | 2.59E-01 | 2.74E-01 | 6.83E-01 |
| | | 272.11 | | 21.20 | 2.23E-01 | | 2.74E-01 |
| + | HF-175 | 343.40 | | 84.00 | 3.30E-02 | 1.54E-01 | 1.54E-01 |
| + | LU-176 | 88.34 | | 13.30 | 4.79E-02 | 4.94E-02 | 3.32E-01 |
| | | 201.83 | | 86.00 | 8.90E-03 | | 5.51E-02 |
| | | 306.78 | | 94.00 | 2.90E-02 | | 4.94E-02 |
| + | HF-181 | 133.02 | | 41.70 | -8.53E-03 | 2.82E-01 | 4.08E-01 |
| | | 345.85 | | 17.20 | 3.54E-01 | | 1.37E+00 |
| | | 482.03 | | 82.80 | 5.90E-02 | | 2.82E-01 |
| + | TA-182 | 67.75 | | 41.20 | 1.25E-02 | 1.90E-01 | 1.90E-01 |
| | | 1121.30 | | 34.90 | 3.29E-01 | | 5.75E-01 |
| | | 1189.05 | | 16.23 | 1.12E-01 | | 9.75E-01 |
| | | 1221.41 | | 26.98 | -1.65E-01 | | 6.57E-01 |
| | | 1231.02 | | 11.44 | -6.90E-01 | | 1.48E+00 |
| + | IR-192 | 308.46 | | 29.68 | -6.03E-02 | 2.27E-01 | 3.71E-01 |
| | | 468.07 | | 48.10 | 3.36E-02 | | 2.27E-01 |
| + | HG-203 | 279.19 | | 77.30 | -6.30E-02 | 2.65E-01 | 2.65E-01 |
| + | TL-204 | 374.74 | | 94.11 | 2.08E-02 | 5.09E-02 | 5.09E-02 |
| | | 899.15 | | 99.16 | 5.74E-03 | | 7.68E-02 |
| | | 911.74 | | 91.10 | 3.23E-01 | | 1.46E-01 |
| + | BI-207 | 569.67 | | 97.72 | -1.84E-02 | 5.08E-02 | 5.08E-02 |
| | | 1063.62 | | 74.90 | 1.42E-02 | | 9.60E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 9.65E-01 | 1.05E-01 | 2.82E-01 |
| | | 860.37 | | 4.48 | 1.52E+00 | | 1.88E+00 |
| | | 2614.66 | * | 35.85 | 9.48E-01 | | 1.05E-01 |
| + | BI-210M | 262.00 | | 45.00 | -2.57E-02 | 9.84E-02 | 9.84E-02 |
| | | 300.00 | | 23.00 | 2.17E-01 | | 2.24E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 9.97E-01 | 1.65E+00 | 1.65E+00 |
| + | PB-211 | 404.84 | | 2.90 | 9.17E-01 | 1.71E+00 | 1.71E+00 |
| | | 831.96 | | 2.90 | 9.27E-01 | | 2.18E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 4.19E-01 | 7.83E-01 | 7.83E-01 |
| | | 1620.62 | | 2.75 | 3.58E-01 | | 2.46E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.04E+00 | 2.28E-01 | 2.28E-01 |
| | | 300.09 | * | 3.41 | 1.19E+00 | | 2.87E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 8.42E-01 | 1.81E-01 | 1.81E-01 |
| | | 1120.29 | * | 15.10 | 5.31E-01 | | 8.11E-01 |
| | | 1764.49 | * | 15.80 | 1.36E+00 | | 2.57E-01 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | BI-214 | 2204.22 | * | 4.98 | 1.44E+00 | 1.81E-01 | 1.67E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 8.79E-01 | 2.06E-01 | 5.06E-01 |
| | | 351.92 | * | 37.19 | 9.72E-01 | | 2.06E-01 |
| + | RN-219 | 401.80 | | 6.50 | 3.79E-01 | 7.24E-01 | 7.24E-01 |
| + | RA-223 | 323.87 | | 3.88 | 3.23E-01 | 1.18E+00 | 1.18E+00 |
| + | RA-224 | 240.98 | | 3.95 | 7.57E+00 | 2.40E+00 | 2.40E+00 |
| + | RA-225 | 40.00 | | 31.00 | 2.55E+01 | 2.91E+01 | 2.91E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.56E+00 | 1.83E+00 | 1.83E+00 |
| + | TH-227 | 50.10 | | 8.40 | -2.94E-02 | 5.30E-01 | 5.30E-01 |
| | | 236.00 | | 11.50 | -4.28E+00 | | 5.77E-01 |
| | | 256.20 | | 6.30 | 2.77E-01 | | 7.40E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 9.98E-01 | 4.07E-01 | 7.34E-01 |
| | | 911.07 | * | 27.70 | 9.49E-01 | | 4.07E-01 |
| | | 969.11 | * | 16.60 | 1.29E+00 | | 6.02E-01 |
| + | TH-230 | 48.44 | | 16.90 | -3.95E-01 | 2.75E-01 | 2.75E-01 |
| | | 62.85 | | 4.60 | 1.45E+00 | | 1.08E+00 |
| | | 67.67 | | 0.37 | 7.66E-01 | | 1.16E+01 |
| + | PA-231 | 283.67 | | 1.60 | -1.55E+00 | 2.08E+00 | 2.70E+00 |
| | | 302.67 | | 2.30 | -9.00E-01 | | 2.08E+00 |
| + | TH-231 | 25.64 | | 14.70 | 0.00E+00 | 1.21E-01 | 1.21E-01 |
| | | 84.21 | | 6.40 | -6.92E-01 | | 6.15E-01 |
| + | PA-233 | 311.98 | | 38.60 | 1.47E-01 | 1.56E+00 | 1.56E+00 |
| + | PA-234 | 131.20 | | 20.40 | 1.85E-02 | 1.67E-01 | 1.67E-01 |
| | | 733.99 | | 8.80 | -1.02E-01 | | 6.82E-01 |
| | | 946.00 | | 12.00 | 1.53E-01 | | 5.24E-01 |
| + | PA-234M | 1001.03 | | 0.92 | 3.72E+00 | 8.13E+00 | 8.13E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 1.10E+00 | 1.94E+00 | 1.94E+00 |
| + | U-235 | 143.76 | | 10.50 | 1.66E-01 | 4.32E-01 | 4.32E-01 |
| | | 163.35 | | 4.70 | 8.29E-02 | | 9.85E-01 |
| | | 205.31 | | 4.70 | 4.24E-01 | | 1.01E+00 |
| + | NP-237 | 86.50 | | 12.60 | 3.82E-01 | 3.49E-01 | 3.49E-01 |
| + | NP-239 | 106.10 | | 22.70 | 3.04E+11 | 7.15E+11 | 7.15E+11 |
| | | 228.18 | | 10.70 | 7.11E+11 | | 2.07E+12 |
| | | 277.60 | | 14.10 | 4.66E+11 | | 1.64E+12 |
| + | AM-241 | 59.54 | | 35.90 | -5.04E-02 | 1.17E-01 | 1.17E-01 |
| + | AM-243 | 74.67 | | 66.00 | -1.31E-01 | 8.41E-02 | 8.41E-02 |
| + | CM-243 | 209.75 | * | 3.29 | 1.38E+00 | 4.19E-01 | 1.84E+00 |
| | | 228.14 | | 10.60 | 1.49E-01 | | 4.34E-01 |
| | | 277.60 | * | 14.00 | 2.06E-01 | | 4.19E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.59E+00 | 1.59E+00 | 9.35E-02 | 7.42E-01 |
| | NA-22 | 1274.54 | | 99.94 | 7.58E-02 | 7.58E-02 | -2.43E-02 | 3.43E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 5.28E-02 | 5.28E-02 | -1.42E-02 | 2.21E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.08E+00 | 1.08E+00 | 1.86E+01 | 5.07E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 4.55E-02 | 4.55E-02 | 3.01E-03 | 2.21E-02 |
| | | 78.34 | | 96.00 | 5.20E-02 | | 5.08E-02 | 2.54E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.50E-01 | 1.50E-01 | -4.60E-02 | 6.94E-02 |
| | | 1120.51 | | 99.99 | 2.57E-01 | | 2.36E-01 | 1.22E-01 |
| | V-48 | 983.52 | | 99.98 | 4.60E+00 | 4.60E+00 | -1.04E+00 | 2.10E+00 |
| | | 1312.10 | | 97.50 | 5.41E+00 | | -2.85E+00 | 2.45E+00 |
| | CR-51 | 320.08 | | 9.83 | 5.61E+00 | 5.61E+00 | 2.84E+00 | 2.67E+00 |
| | MN-54 | 834.83 | | 99.97 | 8.69E-02 | 8.69E-02 | 1.72E-02 | 4.05E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.63E-01 | 1.63E-01 | 6.80E-02 | 7.56E-02 |
| | | 1037.75 | | 14.03 | 1.34E+00 | | 5.66E-01 | 6.20E-01 |
| | | 1238.25 | | 67.00 | 3.56E-01 | | 8.73E-02 | 1.66E-01 |
| | | 1771.40 | | 15.51 | 6.79E-01 | | -8.51E-01 | 2.74E-01 |
| | | 2598.48 | | 16.90 | 6.77E-01 | | -3.10E-01 | 2.69E-01 |
| | CO-57 | 122.06 | | 85.51 | 4.81E-02 | 4.81E-02 | -2.74E-03 | 2.31E-02 |
| | | 136.48 | | 10.60 | 5.02E-01 | | -1.94E-01 | 2.43E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.49E-01 | 1.49E-01 | -9.71E-02 | 6.83E-02 |
| | FE-59 | 1099.22 | | 56.50 | 6.62E-01 | 6.62E-01 | 3.31E-02 | 3.06E-01 |
| | | 1291.56 | | 43.20 | 7.47E-01 | | -3.71E-02 | 3.37E-01 |
| | CO-60 | 1173.22 | | 100.00 | 9.12E-02 | 6.86E-02 | -7.73E-03 | 4.23E-02 |
| | | 1332.49 | | 100.00 | 6.86E-02 | | -1.72E-02 | 3.07E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 2.08E-01 | 2.08E-01 | -4.36E-02 | 9.61E-02 |
| | GA-67 | 93.31 | | 35.70 | 1.80E+08 | 1.80E+08 | 3.34E+08 | 8.75E+07 |
| | | 208.95 | | 2.24 | 3.24E+09 | | 2.25E+09 | 1.56E+09 |
| | | 300.22 | | 16.00 | 4.67E+08 | | 4.52E+08 | 2.24E+08 |
| | SE-75 | 121.11 | | 16.70 | 3.22E-01 | 1.25E-01 | -1.81E-01 | 1.54E-01 |
| | | 136.00 | | 59.20 | 1.25E-01 | | -3.54E-02 | 6.06E-02 |
| | | 264.65 | | 59.80 | 1.35E-01 | | -3.55E-02 | 6.47E-02 |
| | | 279.53 | | 25.20 | 3.31E-01 | | 6.16E-02 | 1.58E-01 |
| | | 400.65 | | 11.40 | 7.09E-01 | | -4.38E-01 | 3.34E-01 |
| | RB-82 | 776.52 | | 13.00 | 6.47E+00 | 6.47E+00 | -1.22E+00 | 2.98E+00 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| RB-83 | 520.41 | 46.00 | 2.11E-01 | 2.11E-01 | -8.93E-02 | 9.79E-02 |
| | 529.64 | 30.30 | 3.23E-01 | | 1.46E-02 | 1.49E-01 |
| | 552.65 | 16.40 | 6.48E-01 | | -1.56E-01 | 3.01E-01 |
| KR-85 | 513.99 | 0.43 | 1.31E+01 | 1.31E+01 | -1.28E+01 | 6.17E+00 |
| SR-85 | 513.99 | 99.27 | 1.63E-01 | 1.63E-01 | -1.59E-01 | 7.66E-02 |
| Y-88 | 898.02 | 93.40 | 1.50E-01 | 1.19E-01 | 3.51E-02 | 6.99E-02 |
| | 1836.01 | 99.38 | 1.19E-01 | | 4.51E-02 | 5.13E-02 |
| MO-93 | 263.06 | 56.72 | 7.96E-02 | 5.51E-02 | -1.30E-02 | 3.81E-02 |
| | 684.67 | 99.68 | 5.69E-02 | | -4.01E-02 | 2.64E-02 |
| | 1477.11 | 99.08 | 5.51E-02 | | 1.07E-02 | 2.37E-02 |
| NB-93M | 16.57 | 9.43 | 6.81E+00 | 6.81E+00 | 0.00E+00 | 0.00E+00 |
| NB-94 | 702.63 | 100.00 | 7.00E-02 | 6.13E-02 | 2.53E-02 | 3.29E-02 |
| | 871.10 | 100.00 | 6.13E-02 | | -3.62E-03 | 2.82E-02 |
| NB-95 | 765.79 | 99.81 | 4.80E-01 | 4.80E-01 | 3.12E-02 | 2.24E-01 |
| NB-95M | 235.69 | 25.00 | 5.01E+07 | 5.01E+07 | -3.72E+08 | 2.44E+07 |
| ZR-95 | 724.18 | 43.70 | 5.37E-01 | 3.51E-01 | 4.91E-03 | 2.54E-01 |
| | 756.72 | 55.30 | 3.51E-01 | | 1.11E-01 | 1.64E-01 |
| MO-99 | 181.06 | 6.20 | 5.24E+10 | 3.01E+10 | 3.28E+10 | 2.53E+10 |
| | 739.58 | 12.80 | 3.01E+10 | | -8.31E+09 | 1.38E+10 |
| | 778.00 | 4.50 | 8.54E+10 | | -1.66E+10 | 3.91E+10 |
| RU-103 | 497.08 | 89.00 | 3.17E-01 | 3.17E-01 | 1.16E-01 | 1.48E-01 |
| RU-106 | 621.84 | 9.80 | 6.91E-01 | 6.91E-01 | -3.47E-01 | 3.22E-01 |
| AG-108M | 433.93 | 89.90 | 5.41E-02 | 5.41E-02 | -5.09E-04 | 2.55E-02 |
| | 614.37 | 90.40 | 6.93E-02 | | -3.12E-03 | 3.26E-02 |
| | 722.95 | 90.50 | 7.88E-02 | | 6.26E-03 | 3.71E-02 |
| CD-109 | 88.03 | 3.72 | 1.38E+00 | 1.38E+00 | 2.13E+00 | 6.71E-01 |
| AG-110M | 657.75 | 93.14 | 7.95E-02 | 7.95E-02 | 7.24E-03 | 3.70E-02 |
| | 677.61 | 10.53 | 7.68E-01 | | 2.29E-01 | 3.59E-01 |
| | 706.67 | 16.46 | 5.38E-01 | | -1.62E-01 | 2.52E-01 |
| | 763.93 | 21.98 | 3.68E-01 | | -4.87E-03 | 1.71E-01 |
| | 884.67 | 71.63 | 1.21E-01 | | -6.14E-02 | 5.59E-02 |
| | 1384.27 | 23.94 | 4.13E-01 | | 4.47E-02 | 1.87E-01 |
| CD-113M | 263.70 | 0.02 | 1.94E+02 | 1.94E+02 | -1.23E+02 | 9.25E+01 |
| SN-113 | 255.12 | 1.93 | 4.36E+00 | 1.33E-01 | 2.31E+00 | 2.09E+00 |
| | 391.69 | 64.90 | 1.33E-01 | | 2.28E-02 | 6.29E-02 |
| TE123M | 159.00 | 84.10 | 9.06E-02 | 9.06E-02 | 1.92E-02 | 4.38E-02 |
| SB-124 | 602.71 | 97.87 | 1.87E-01 | 1.87E-01 | 3.03E-02 | 8.78E-02 |
| | 645.85 | 7.26 | 2.70E+00 | | 1.62E+00 | 1.27E+00 |
| | 722.78 | 11.10 | 1.92E+00 | | 1.16E-01 | 9.01E-01 |
| | 1691.02 | 49.00 | 3.51E-01 | | 1.27E-01 | 1.49E-01 |
| I-125 | 35.49 | 6.49 | 6.24E+00 | 6.24E+00 | -3.98E+01 | 3.02E+00 |
| SB-125 | 176.33 | 6.89 | 6.84E-01 | 1.59E-01 | -2.14E-02 | 3.30E-01 |
| | 427.89 | 29.33 | 1.59E-01 | | -7.59E-02 | 7.43E-02 |
| | 463.38 | 10.35 | 5.63E-01 | | 2.32E-01 | 2.66E-01 |
| | 600.56 | 17.80 | 3.71E-01 | | 1.34E-01 | 1.75E-01 |
| | 635.90 | 11.32 | 5.33E-01 | | 7.42E-02 | 2.49E-01 |
| SB-126 | 414.70 | 83.30 | 1.43E+01 | 1.43E+01 | 5.17E+00 | 6.73E+00 |
| | 666.33 | 99.60 | 1.71E+01 | | 8.12E-01 | 8.04E+00 |
| | 695.00 | 99.60 | 1.58E+01 | | -4.14E+00 | 7.38E+00 |
| | 720.50 | 53.80 | 3.14E+01 | | 3.29E-01 | 1.47E+01 |
| SN-126 | 87.57 | 37.00 | 1.20E-01 | 1.20E-01 | 1.85E-01 | 5.82E-02 |
| SB-127 | 473.00 | 25.00 | 1.17E+07 | 9.36E+06 | 8.23E+06 | 5.49E+06 |
| | 685.20 | 35.70 | 9.36E+06 | | -4.51E+06 | 4.36E+06 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| SB-127 | 783.80 | 14.70 | 2.74E+07 | 9.36E+06 | 2.68E+07 | 1.28E+07 |
| I-129 | 29.78 | 57.00 | 3.90E-01 | 3.90E-01 | 6.70E-02 | 1.88E-01 |
| | 33.60 | 13.20 | 2.00E+00 | | 8.17E+00 | 9.81E-01 |
| | 39.58 | 7.52 | 1.18E+00 | | 1.04E+00 | 5.72E-01 |
| I-131 | 284.30 | 6.05 | 3.71E+03 | 2.96E+02 | -2.13E+03 | 1.77E+03 |
| | 364.48 | 81.20 | 2.96E+02 | | 3.09E+01 | 1.40E+02 |
| | 636.97 | 7.26 | 4.04E+03 | | 1.54E+03 | 1.88E+03 |
| | 722.89 | 1.80 | 2.06E+04 | | 1.63E+03 | 9.68E+03 |
| TE-132 | 49.72 | 13.10 | 5.08E+08 | 7.66E+07 | -2.82E+07 | 2.44E+08 |
| | 228.16 | 88.00 | 7.66E+07 | | 2.63E+07 | 3.68E+07 |
| BA-133 | 81.00 | 33.00 | 1.14E-01 | 7.96E-02 | 6.39E-02 | 5.52E-02 |
| | 302.84 | 17.80 | 2.74E-01 | | -1.18E-01 | 1.31E-01 |
| | 356.01 | 60.00 | 7.96E-02 | | 2.57E-03 | 3.77E-02 |
| @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| XE-133 | 81.00 | 38.00 | 4.85E+04 | 4.85E+04 | 2.72E+04 | 2.35E+04 |
| CS-134 | 563.23 | 8.38 | 6.88E-01 | 6.50E-02 | 2.36E-01 | 3.22E-01 |
| | 569.32 | 15.43 | 3.51E-01 | | -1.27E-01 | 1.63E-01 |
| | 604.70 | 97.60 | 6.50E-02 | | -5.94E-03 | 3.05E-02 |
| | 795.84 | 85.40 | 9.93E-02 | | 7.87E-02 | 4.68E-02 |
| | 801.93 | 8.73 | 8.22E-01 | | -1.70E-02 | 3.82E-01 |
| CS-135 | 268.24 | 16.00 | 3.17E-01 | 3.17E-01 | -1.97E-02 | 1.52E-01 |
| @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CS-136 | 153.22 | 7.46 | 1.08E+02 | 1.20E+01 | -1.27E+01 | 5.22E+01 |
| | 163.89 | 4.61 | 1.87E+02 | | 1.58E+01 | 9.08E+01 |
| | 176.55 | 13.56 | 6.05E+01 | | -1.90E+00 | 2.92E+01 |
| | 273.65 | 12.66 | 6.76E+01 | | -3.55E+01 | 3.23E+01 |
| | 340.57 | 48.50 | 2.22E+01 | | -9.46E+00 | 1.06E+01 |
| | 818.50 | 99.70 | 1.20E+01 | | 3.89E+00 | 5.59E+00 |
| | 1048.07 | 79.60 | 1.83E+01 | | 9.26E+00 | 8.50E+00 |
| | 1235.34 | 19.70 | 9.59E+01 | | 2.59E+01 | 4.49E+01 |
| CS-137 | 661.65 | 85.12 | 7.80E-02 | 7.80E-02 | 1.22E-02 | 3.67E-02 |
| LA-138 | 788.74 | 34.00 | 1.94E-01 | 9.40E-02 | -2.38E-02 | 9.05E-02 |
| | 1435.80 | 66.00 | 9.40E-02 | | 2.02E-02 | 4.15E-02 |
| CE-139 | 165.85 | 80.35 | 9.22E-02 | 9.22E-02 | 6.38E-02 | 4.46E-02 |
| BA-140 | 162.64 | 6.70 | 1.52E+02 | 3.82E+01 | 6.35E+01 | 7.39E+01 |
| | 304.84 | 4.50 | 2.19E+02 | | 4.56E+01 | 1.04E+02 |
| | 423.70 | 3.20 | 3.21E+02 | | 1.31E+02 | 1.51E+02 |
| | 437.55 | 2.00 | 5.24E+02 | | 3.61E+01 | 2.47E+02 |
| | 537.32 | 25.00 | 3.82E+01 | | -2.70E+01 | 1.77E+01 |
| LA-140 | 328.77 | 20.50 | 5.90E+01 | 1.55E+01 | 6.87E+01 | 2.83E+01 |
| | 487.03 | 45.50 | 2.24E+01 | | 6.58E+00 | 1.05E+01 |
| | 815.85 | 23.50 | 5.41E+01 | | -1.08E+01 | 2.49E+01 |
| | 1596.49 | 95.49 | 1.55E+01 | | 1.32E+00 | 6.88E+00 |
| CE-141 | 145.44 | 48.40 | 7.69E-01 | 7.69E-01 | 1.92E-01 | 3.73E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 4.05E-01 | 4.05E-01 | 3.24E-01 | 1.95E-01 |
| PM-144 | 476.78 | 42.00 | 1.31E-01 | 7.13E-02 | 7.73E-03 | 6.13E-02 |
| | 618.01 | 98.60 | 7.13E-02 | | -1.05E-02 | 3.34E-02 |
| | 696.49 | 99.49 | 7.62E-02 | | 1.83E-03 | 3.56E-02 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| PM-145 | 36.85 | 21.70 | 5.20E-01 | 2.68E-01 | 6.35E-02 | 2.52E-01 |
| | 37.36 | 39.70 | 2.68E-01 | | -8.46E-02 | 1.29E-01 |
| | 42.30 | 15.10 | 4.14E-01 | | -7.43E-02 | 1.99E-01 |
| | 72.40 | 2.31 | 1.89E+00 | | -7.60E+00 | 9.16E-01 |
| PM-146 | 453.90 | 39.94 | 1.20E-01 | 1.20E-01 | 3.61E-02 | 5.63E-02 |
| | 735.90 | 14.01 | 4.11E-01 | | -9.18E-02 | 1.90E-01 |
| | 747.13 | 13.10 | 5.58E-01 | | 2.09E-01 | 2.62E-01 |
| ND-147 | 91.11 | 28.90 | 7.86E+01 | 7.86E+01 | -1.03E+02 | 3.83E+01 |
| | 531.02 | 13.10 | 1.72E+02 | | -5.96E+01 | 7.95E+01 |
| PM-149 | 285.90 | 3.10 | 4.53E+13 | 4.53E+13 | -3.37E+12 | 2.16E+13 |
| EU-152 | 121.78 | 20.50 | 1.58E-01 | 1.58E-01 | -8.97E-03 | 7.57E-02 |
| | 244.69 | 5.40 | 9.14E-01 | | -1.11E+00 | 4.40E-01 |
| | 344.27 | 19.13 | 2.46E-01 | | 6.34E-02 | 1.17E-01 |
| | 778.89 | 9.20 | 5.85E-01 | | -1.14E-01 | 2.68E-01 |
| | 964.01 | 10.40 | 8.14E-01 | | -1.08E-01 | 3.81E-01 |
| | 1085.78 | 7.22 | 1.00E+00 | | -2.35E-01 | 4.59E-01 |
| | 1112.02 | 9.60 | 7.99E-01 | | 6.14E-02 | 3.68E-01 |
| | 1407.95 | 14.94 | 5.53E-01 | | 3.41E-01 | 2.52E-01 |
| GD-153 | 97.43 | 31.30 | 1.32E-01 | 1.32E-01 | -5.26E-02 | 6.37E-02 |
| | 103.18 | 22.20 | 1.69E-01 | | -2.12E-01 | 8.09E-02 |
| EU-154 | 123.07 | 40.50 | 8.31E-02 | 8.31E-02 | 1.32E-02 | 4.00E-02 |
| | 723.30 | 19.70 | 3.70E-01 | | 2.93E-02 | 1.74E-01 |
| | 873.19 | 11.50 | 5.52E-01 | | 2.57E-02 | 2.54E-01 |
| | 996.32 | 10.30 | 6.13E-01 | | -5.00E-01 | 2.80E-01 |
| | 1004.76 | 17.90 | 4.17E-01 | | -1.25E-01 | 1.93E-01 |
| | 1274.45 | 35.50 | 2.03E-01 | | -6.49E-02 | 9.18E-02 |
| EU-155 | 86.50 | 30.90 | 1.48E-01 | 1.48E-01 | 1.62E-01 | 7.20E-02 |
| | 105.30 | 20.70 | 1.68E-01 | | 7.12E-02 | 8.08E-02 |
| EU-156 | 811.77 | 10.40 | 5.21E+01 | 5.21E+01 | -1.12E+01 | 2.40E+01 |
| | 1153.47 | 7.20 | 1.15E+02 | | -1.32E+01 | 5.36E+01 |
| | 1230.71 | 8.90 | 9.66E+01 | | -4.50E+01 | 4.49E+01 |
| HO-166M | 184.41 | 72.60 | 7.59E-02 | 7.59E-02 | 1.06E-01 | 3.69E-02 |
| | 280.45 | 29.60 | 1.50E-01 | | 6.10E-02 | 7.16E-02 |
| | 410.94 | 11.10 | 4.40E-01 | | 9.40E-02 | 2.08E-01 |
| | 711.69 | 54.10 | 1.23E-01 | | 1.62E-02 | 5.75E-02 |
| TM-171 | 66.72 | 0.14 | 3.42E+01 | 3.42E+01 | 1.07E+01 | 1.66E+01 |
| HF-172 | 67.35 | 5.31 | 8.95E-01 | 3.29E-01 | 5.92E-02 | 4.35E-01 |
| | 125.81 | 11.30 | 3.29E-01 | | -4.11E-02 | 1.58E-01 |
| LU-172 | 181.53 | 20.60 | 6.16E+03 | 3.11E+03 | 2.52E+03 | 2.97E+03 |
| | 900.72 | 29.81 | 7.11E+03 | | 1.10E+03 | 3.31E+03 |
| | 1093.66 | 62.50 | 3.11E+03 | | -5.61E+02 | 1.42E+03 |
| LU-173 | 100.72 | 5.24 | 6.83E-01 | 2.74E-01 | 2.59E-01 | 3.29E-01 |
| | 272.11 | 21.20 | 2.74E-01 | | 2.23E-01 | 1.32E-01 |
| HF-175 | 343.40 | 84.00 | 1.54E-01 | 1.54E-01 | 3.30E-02 | 7.33E-02 |
| LU-176 | 88.34 | 13.30 | 3.32E-01 | 4.94E-02 | 4.79E-02 | 1.61E-01 |
| | 201.83 | 86.00 | 5.51E-02 | | 8.90E-03 | 2.66E-02 |
| | 306.78 | 94.00 | 4.94E-02 | | 2.90E-02 | 2.35E-02 |
| HF-181 | 133.02 | 41.70 | 4.08E-01 | 2.82E-01 | -8.53E-03 | 1.96E-01 |
| | 345.85 | 17.20 | 1.37E+00 | | 3.54E-01 | 6.50E-01 |
| | 482.03 | 82.80 | 2.82E-01 | | 5.90E-02 | 1.32E-01 |
| TA-182 | 67.75 | 41.20 | 1.90E-01 | 1.90E-01 | 1.25E-02 | 9.20E-02 |
| | 1121.30 | 34.90 | 5.75E-01 | | 3.29E-01 | 2.72E-01 |
| | 1189.05 | 16.23 | 9.75E-01 | | 1.12E-01 | 4.52E-01 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TA-182 | 1221.41 | | 26.98 | 6.57E-01 | 1.90E-01 | -1.65E-01 | 3.07E-01 |
| | | 1231.02 | | 11.44 | 1.48E+00 | | -6.90E-01 | 6.89E-01 |
| | IR-192 | 308.46 | | 29.68 | 3.71E-01 | 2.27E-01 | -6.03E-02 | 1.76E-01 |
| | | 468.07 | | 48.10 | 2.27E-01 | | 3.36E-02 | 1.06E-01 |
| | HG-203 | 279.19 | | 77.30 | 2.65E-01 | 2.65E-01 | -6.30E-02 | 1.27E-01 |
| | TL-204 | 374.74 | | 94.11 | 5.09E-02 | 5.09E-02 | 2.08E-02 | 2.40E-02 |
| | | 899.15 | | 99.16 | 7.68E-02 | | 5.74E-03 | 3.57E-02 |
| | | 911.74 | | 91.10 | 1.46E-01 | | 3.23E-01 | 7.02E-02 |
| | BI-207 | 569.67 | | 97.72 | 5.08E-02 | 5.08E-02 | -1.84E-02 | 2.36E-02 |
| | | 1063.62 | | 74.90 | 9.60E-02 | | 1.42E-02 | 4.41E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 2.82E-01 | 1.05E-01 | 9.65E-01 | 1.35E-01 |
| | | 860.37 | | 4.48 | 1.88E+00 | | 1.52E+00 | 8.87E-01 |
| | | 2614.66 | * | 35.85 | 1.05E-01 | | 9.48E-01 | 3.87E-02 |
| | BI-210M | 262.00 | | 45.00 | 9.84E-02 | 9.84E-02 | -2.57E-02 | 4.70E-02 |
| | | 300.00 | | 23.00 | 2.24E-01 | | 2.17E-01 | 1.07E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 1.65E+00 | 1.65E+00 | 9.97E-01 | 8.00E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.71E+00 | 1.71E+00 | 9.17E-01 | 8.09E-01 |
| | | 831.96 | | 2.90 | 2.18E+00 | | 9.27E-01 | 1.01E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 7.83E-01 | 7.83E-01 | 4.19E-01 | 3.73E-01 |
| | | 1620.62 | | 2.75 | 2.46E+00 | | 3.58E-01 | 1.09E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 2.28E-01 | 2.28E-01 | 1.04E+00 | 1.12E-01 |
| | | 300.09 | * | 3.41 | 2.87E+00 | | 1.19E+00 | 1.40E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 1.81E-01 | 1.81E-01 | 8.42E-01 | 8.65E-02 |
| | | 1120.29 | * | 15.10 | 8.11E-01 | | 5.31E-01 | 3.86E-01 |
| | | 1764.49 | * | 15.80 | 2.57E-01 | | 1.36E+00 | 1.02E-01 |
| | | 2204.22 | * | 4.98 | 1.67E+00 | | 1.44E+00 | 7.40E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 5.06E-01 | 2.06E-01 | 8.79E-01 | 2.47E-01 |
| | | 351.92 | * | 37.19 | 2.06E-01 | | 9.72E-01 | 9.97E-02 |
| | RN-219 | 401.80 | | 6.50 | 7.24E-01 | 7.24E-01 | 3.79E-01 | 3.41E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.18E+00 | 1.18E+00 | 3.23E-01 | 5.60E-01 |
| | RA-224 | 240.98 | | 3.95 | 2.40E+00 | 2.40E+00 | 7.57E+00 | 1.18E+00 |
| | RA-225 | 40.00 | | 31.00 | 2.91E+01 | 2.91E+01 | 2.55E+01 | 1.41E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.83E+00 | 1.83E+00 | 2.56E+00 | 8.93E-01 |
| | TH-227 | 50.10 | | 8.40 | 5.30E-01 | 5.30E-01 | -2.94E-02 | 2.55E-01 |
| | | 236.00 | | 11.50 | 5.77E-01 | | -4.28E+00 | 2.81E-01 |
| | | 256.20 | | 6.30 | 7.40E-01 | | 2.77E-01 | 3.55E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 7.34E-01 | 4.07E-01 | 9.98E-01 | 3.57E-01 |
| | | 911.07 | * | 27.70 | 4.07E-01 | | 9.49E-01 | 1.94E-01 |
| | | 969.11 | * | 16.60 | 6.02E-01 | | 1.29E+00 | 2.85E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.75E-01 | 2.75E-01 | -3.95E-01 | 1.32E-01 |
| | | 62.85 | | 4.60 | 1.08E+00 | | 1.45E+00 | 5.24E-01 |
| | | 67.67 | | 0.37 | 1.16E+01 | | 7.66E-01 | 5.62E+00 |
| | PA-231 | 283.67 | | 1.60 | 2.70E+00 | 2.08E+00 | -1.55E+00 | 1.28E+00 |
| | | 302.67 | | 2.30 | 2.08E+00 | | -9.00E-01 | 9.93E-01 |
| | TH-231 | 25.64 | | 14.70 | 1.21E-01 | 1.21E-01 | 0.00E+00 | 0.00E+00 |
| | | 84.21 | | 6.40 | 6.15E-01 | | -6.92E-01 | 2.98E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.56E+00 | 1.56E+00 | 1.47E-01 | 7.42E-01 |
| | PA-234 | 131.20 | | 20.40 | 1.67E-01 | 1.67E-01 | 1.85E-02 | 8.02E-02 |
| | | 733.99 | | 8.80 | 6.82E-01 | | -1.02E-01 | 3.17E-01 |
| | | 946.00 | | 12.00 | 5.24E-01 | | 1.53E-01 | 2.40E-01 |
| | PA-234M | 1001.03 | | 0.92 | 8.13E+00 | 8.13E+00 | 3.72E+00 | 3.77E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 1.94E+00 | 1.94E+00 | 1.10E+00 | 9.52E-01 |
| | U-235 | 143.76 | | 10.50 | 4.32E-01 | 4.32E-01 | 1.66E-01 | 2.10E-01 |

Analysis Report for 1707087-13

HTC-A03-S002-3642-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | U-235 | 163.35 | | 4.70 | 9.85E-01 | 4.32E-01 | 8.29E-02 | 4.77E-01 |
| | | 205.31 | | 4.70 | 1.01E+00 | | 4.24E-01 | 4.86E-01 |
| | NP-237 | 86.50 | | 12.60 | 3.49E-01 | 3.49E-01 | 3.82E-01 | 1.70E-01 |
| | NP-239 | 106.10 | | 22.70 | 7.15E+11 | 7.15E+11 | 3.04E+11 | 3.45E+11 |
| | | 228.18 | | 10.70 | 2.07E+12 | | 7.11E+11 | 9.95E+11 |
| | | 277.60 | | 14.10 | 1.64E+12 | | 4.66E+11 | 7.87E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.17E-01 | 1.17E-01 | -5.04E-02 | 5.66E-02 |
| | AM-243 | 74.67 | | 66.00 | 8.41E-02 | 8.41E-02 | -1.31E-01 | 4.11E-02 |
| + | CM-243 | 209.75 | * | 3.29 | 1.84E+00 | 4.19E-01 | 1.38E+00 | 8.97E-01 |
| | | 228.14 | | 10.60 | 4.34E-01 | | 1.49E-01 | 2.08E-01 |
| | | 277.60 | * | 14.00 | 4.19E-01 | | 2.06E-01 | 2.02E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-3642-01

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 24 | 96 | 114 | 137 |
| 33: | 136 | 689 | 113 | 104 | 106 | 99 | 93 | 110 |
| 41: | 95 | 63 | 67 | 70 | 58 | 82 | 150 | 66 |
| 49: | 63 | 68 | 72 | 75 | 102 | 90 | 64 | 85 |
| 57: | 88 | 85 | 78 | 104 | 103 | 119 | 147 | 177 |
| 65: | 102 | 122 | 127 | 120 | 119 | 119 | 117 | 124 |
| 73: | 121 | 153 | 341 | 191 | 386 | 353 | 100 | 112 |
| 81: | 96 | 103 | 82 | 128 | 135 | 96 | 185 | 173 |
| 89: | 101 | 183 | 128 | 127 | 226 | 142 | 91 | 78 |
| 97: | 67 | 74 | 80 | 86 | 67 | 66 | 57 | 53 |
| 105: | 94 | 85 | 69 | 80 | 67 | 74 | 95 | 63 |
| 113: | 72 | 69 | 92 | 78 | 56 | 84 | 74 | 54 |
| 121: | 65 | 66 | 74 | 78 | 71 | 75 | 77 | 77 |
| 129: | 77 | 89 | 66 | 65 | 68 | 79 | 74 | 49 |
| 137: | 67 | 56 | 71 | 64 | 65 | 65 | 74 | 73 |
| 145: | 78 | 76 | 67 | 58 | 61 | 63 | 57 | 48 |
| 153: | 70 | 74 | 59 | 64 | 58 | 54 | 42 | 62 |
| 161: | 75 | 80 | 58 | 61 | 70 | 61 | 58 | 55 |
| 169: | 44 | 48 | 52 | 57 | 60 | 57 | 41 | 60 |
| 177: | 55 | 55 | 60 | 53 | 65 | 54 | 40 | 50 |
| 185: | 84 | 159 | 74 | 55 | 52 | 44 | 54 | 56 |
| 193: | 54 | 49 | 43 | 60 | 53 | 56 | 43 | 44 |
| 201: | 52 | 53 | 58 | 58 | 56 | 44 | 42 | 55 |
| 209: | 72 | 62 | 51 | 46 | 46 | 40 | 49 | 43 |
| 217: | 43 | 40 | 64 | 61 | 41 | 46 | 36 | 57 |
| 225: | 42 | 41 | 46 | 37 | 36 | 47 | 33 | 41 |
| 233: | 45 | 39 | 50 | 39 | 47 | 253 | 512 | 102 |
| 241: | 73 | 109 | 68 | 44 | 38 | 35 | 29 | 37 |
| 249: | 35 | 41 | 28 | 31 | 26 | 37 | 48 | 33 |
| 257: | 37 | 28 | 35 | 35 | 37 | 29 | 26 | 32 |
| 265: | 35 | 33 | 40 | 38 | 34 | 59 | 47 | 37 |
| 273: | 29 | 27 | 28 | 40 | 33 | 47 | 31 | 20 |
| 281: | 32 | 33 | 29 | 25 | 27 | 20 | 34 | 29 |
| 289: | 27 | 30 | 32 | 38 | 37 | 37 | 158 | 95 |
| 297: | 34 | 24 | 30 | 50 | 49 | 25 | 15 | 28 |
| 305: | 34 | 27 | 30 | 24 | 24 | 17 | 25 | 25 |
| 313: | 45 | 27 | 29 | 26 | 20 | 26 | 26 | 30 |
| 321: | 21 | 25 | 20 | 31 | 20 | 28 | 32 | 62 |
| 329: | 38 | 26 | 26 | 18 | 23 | 23 | 30 | 19 |
| 337: | 23 | 82 | 71 | 42 | 34 | 22 | 18 | 29 |
| 345: | 25 | 22 | 22 | 18 | 35 | 26 | 101 | 275 |
| 353: | 84 | 29 | 17 | 24 | 22 | 21 | 24 | 18 |
| 361: | 19 | 17 | 21 | 25 | 16 | 27 | 21 | 19 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 32 | 22 | 20 | 15 | 18 | 23 | 20 | 19 |

Sample Title: HTC-A03-S002-3642-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 18 | 16 | 18 | 18 | 19 | 19 | 19 | 23 |
| 385: | 15 | 17 | 24 | 17 | 9 | 15 | 27 | 15 |
| 393: | 20 | 23 | 25 | 13 | 15 | 25 | 16 | 17 |
| 401: | 14 | 14 | 27 | 22 | 12 | 27 | 16 | 27 |
| 409: | 26 | 29 | 17 | 9 | 17 | 13 | 15 | 21 |
| 417: | 21 | 18 | 17 | 14 | 19 | 16 | 17 | 14 |
| 425: | 22 | 19 | 10 | 14 | 8 | 21 | 16 | 17 |
| 433: | 25 | 15 | 18 | 14 | 19 | 17 | 19 | 18 |
| 441: | 15 | 19 | 12 | 13 | 11 | 13 | 19 | 12 |
| 449: | 14 | 13 | 17 | 17 | 17 | 17 | 14 | 10 |
| 457: | 14 | 8 | 12 | 17 | 12 | 14 | 47 | 20 |
| 465: | 9 | 15 | 20 | 12 | 7 | 7 | 15 | 14 |
| 473: | 25 | 16 | 15 | 7 | 19 | 13 | 13 | 16 |
| 481: | 15 | 16 | 11 | 9 | 12 | 10 | 14 | 14 |
| 489: | 19 | 13 | 12 | 10 | 11 | 8 | 9 | 17 |
| 497: | 16 | 16 | 15 | 16 | 10 | 14 | 13 | 15 |
| 505: | 10 | 9 | 10 | 18 | 23 | 61 | 68 | 35 |
| 513: | 23 | 14 | 13 | 6 | 15 | 15 | 8 | 10 |
| 521: | 12 | 8 | 14 | 17 | 8 | 14 | 10 | 12 |
| 529: | 10 | 13 | 7 | 10 | 9 | 20 | 6 | 9 |
| 537: | 8 | 15 | 13 | 14 | 18 | 10 | 17 | 12 |
| 545: | 11 | 9 | 11 | 13 | 12 | 11 | 15 | 12 |
| 553: | 9 | 11 | 16 | 12 | 10 | 9 | 15 | 12 |
| 561: | 13 | 12 | 10 | 17 | 17 | 10 | 8 | 9 |
| 569: | 13 | 16 | 13 | 14 | 17 | 11 | 16 | 17 |
| 577: | 5 | 13 | 13 | 14 | 15 | 39 | 136 | 69 |
| 585: | 10 | 14 | 6 | 16 | 10 | 7 | 12 | 12 |
| 593: | 9 | 6 | 11 | 14 | 13 | 14 | 16 | 14 |
| 601: | 13 | 6 | 11 | 11 | 6 | 12 | 16 | 41 |
| 609: | 182 | 95 | 13 | 14 | 15 | 10 | 8 | 15 |
| 617: | 11 | 14 | 5 | 8 | 12 | 13 | 8 | 13 |
| 625: | 8 | 18 | 7 | 11 | 14 | 8 | 13 | 9 |
| 633: | 9 | 13 | 13 | 9 | 6 | 11 | 4 | 9 |
| 641: | 5 | 7 | 7 | 22 | 13 | 9 | 6 | 13 |
| 649: | 9 | 8 | 9 | 10 | 4 | 8 | 10 | 5 |
| 657: | 11 | 7 | 9 | 11 | 13 | 18 | 19 | 8 |
| 665: | 15 | 13 | 6 | 10 | 14 | 11 | 12 | 9 |
| 673: | 11 | 15 | 7 | 9 | 10 | 10 | 9 | 10 |
| 681: | 8 | 6 | 8 | 10 | 6 | 15 | 3 | 13 |
| 689: | 14 | 13 | 8 | 10 | 12 | 8 | 11 | 10 |
| 697: | 8 | 8 | 13 | 10 | 11 | 21 | 12 | 11 |
| 705: | 9 | 11 | 12 | 13 | 11 | 9 | 13 | 7 |
| 713: | 13 | 10 | 5 | 13 | 9 | 9 | 9 | 12 |
| 721: | 15 | 5 | 14 | 10 | 13 | 17 | 36 | 22 |
| 729: | 11 | 10 | 11 | 14 | 6 | 12 | 6 | 4 |
| 737: | 5 | 9 | 7 | 5 | 5 | 9 | 11 | 16 |
| 745: | 10 | 12 | 16 | 13 | 5 | 8 | 3 | 14 |
| 753: | 12 | 12 | 10 | 16 | 5 | 6 | 7 | 10 |
| 761: | 5 | 11 | 5 | 7 | 6 | 9 | 14 | 17 |
| 769: | 17 | 7 | 6 | 16 | 8 | 11 | 11 | 6 |
| 777: | 5 | 6 | 0 | 3 | 9 | 8 | 12 | 10 |
| 785: | 9 | 21 | 7 | 5 | 6 | 7 | 8 | 12 |
| 793: | 6 | 16 | 22 | 13 | 7 | 11 | 10 | 4 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 10 | 5 | 16 | 4 | 9 | 11 | 6 | 8 |

Sample Title: HTC-A03-S002-3642-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 6 | 8 | 6 | 6 | 2 | 10 | 7 | 7 |
| 817: | 8 | 6 | 11 | 5 | 12 | 6 | 7 | 6 |
| 825: | 11 | 4 | 4 | 10 | 8 | 7 | 9 | 4 |
| 833: | 6 | 8 | 15 | 14 | 8 | 9 | 8 | 13 |
| 841: | 9 | 6 | 12 | 17 | 6 | 10 | 5 | 2 |
| 849: | 7 | 4 | 7 | 10 | 6 | 6 | 7 | 6 |
| 857: | 8 | 5 | 11 | 21 | 29 | 7 | 10 | 9 |
| 865: | 8 | 4 | 11 | 3 | 8 | 8 | 5 | 4 |
| 873: | 7 | 10 | 5 | 7 | 8 | 6 | 9 | 9 |
| 881: | 8 | 9 | 3 | 11 | 9 | 5 | 6 | 13 |
| 889: | 8 | 6 | 5 | 8 | 9 | 7 | 9 | 6 |
| 897: | 10 | 14 | 10 | 7 | 7 | 7 | 8 | 9 |
| 905: | 8 | 6 | 8 | 4 | 13 | 35 | 71 | 57 |
| 913: | 8 | 6 | 7 | 5 | 7 | 7 | 6 | 3 |
| 921: | 8 | 10 | 10 | 8 | 6 | 6 | 10 | 7 |
| 929: | 5 | 10 | 5 | 10 | 7 | 12 | 13 | 9 |
| 937: | 6 | 8 | 8 | 4 | 5 | 4 | 5 | 6 |
| 945: | 5 | 9 | 3 | 9 | 4 | 5 | 7 | 7 |
| 953: | 8 | 4 | 4 | 7 | 10 | 5 | 10 | 3 |
| 961: | 7 | 7 | 9 | 14 | 22 | 11 | 17 | 38 |
| 969: | 55 | 24 | 4 | 8 | 2 | 4 | 5 | 5 |
| 977: | 6 | 8 | 11 | 4 | 4 | 5 | 8 | 7 |
| 985: | 6 | 3 | 9 | 9 | 2 | 5 | 7 | 4 |
| 993: | 5 | 7 | 4 | 4 | 8 | 2 | 6 | 11 |
| 1001: | 11 | 6 | 10 | 7 | 6 | 9 | 2 | 12 |
| 1009: | 6 | 6 | 4 | 9 | 6 | 4 | 5 | 3 |
| 1017: | 3 | 9 | 2 | 6 | 7 | 7 | 5 | 3 |
| 1025: | 6 | 7 | 7 | 5 | 3 | 9 | 7 | 5 |
| 1033: | 7 | 7 | 8 | 7 | 7 | 7 | 10 | 10 |
| 1041: | 6 | 5 | 6 | 11 | 12 | 6 | 10 | 6 |
| 1049: | 5 | 5 | 3 | 7 | 9 | 9 | 4 | 2 |
| 1057: | 6 | 4 | 6 | 7 | 5 | 6 | 5 | 12 |
| 1065: | 3 | 6 | 5 | 7 | 5 | 7 | 6 | 3 |
| 1073: | 5 | 10 | 8 | 8 | 6 | 11 | 4 | 3 |
| 1081: | 12 | 6 | 5 | 4 | 6 | 3 | 11 | 7 |
| 1089: | 9 | 7 | 4 | 4 | 5 | 5 | 4 | 8 |
| 1097: | 9 | 5 | 7 | 5 | 11 | 8 | 10 | 5 |
| 1105: | 5 | 6 | 3 | 3 | 7 | 11 | 8 | 5 |
| 1113: | 5 | 7 | 9 | 6 | 9 | 10 | 14 | 28 |
| 1121: | 26 | 12 | 8 | 3 | 16 | 8 | 5 | 4 |
| 1129: | 9 | 5 | 5 | 5 | 10 | 11 | 5 | 11 |
| 1137: | 8 | 3 | 5 | 7 | 7 | 8 | 7 | 14 |
| 1145: | 14 | 6 | 7 | 8 | 11 | 7 | 10 | 7 |
| 1153: | 5 | 12 | 9 | 12 | 11 | 8 | 4 | 8 |
| 1161: | 15 | 11 | 6 | 8 | 5 | 9 | 9 | 9 |
| 1169: | 6 | 7 | 6 | 6 | 12 | 10 | 11 | 8 |
| 1177: | 9 | 10 | 4 | 6 | 11 | 9 | 5 | 9 |
| 1185: | 5 | 11 | 2 | 6 | 7 | 10 | 14 | 5 |
| 1193: | 10 | 5 | 12 | 4 | 5 | 9 | 5 | 7 |
| 1201: | 8 | 5 | 8 | 14 | 4 | 10 | 8 | 9 |
| 1209: | 5 | 4 | 7 | 10 | 8 | 14 | 7 | 12 |
| 1217: | 6 | 8 | 9 | 9 | 17 | 8 | 10 | 6 |
| 1225: | 19 | 6 | 5 | 10 | 7 | 9 | 11 | 10 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 8 | 10 | 10 | 8 | 13 | 13 | 10 | 5 |

Sample Title: HTC-A03-S002-3642-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 6 | 10 | 6 | 9 | 10 | 8 | 4 | 7 |
| 1249: | 6 | 7 | 8 | 6 | 4 | 5 | 9 | 8 |
| 1257: | 7 | 1 | 5 | 5 | 5 | 5 | 4 | 6 |
| 1265: | 9 | 5 | 6 | 10 | 10 | 4 | 7 | 6 |
| 1273: | 3 | 5 | 1 | 5 | 4 | 4 | 6 | 4 |
| 1281: | 7 | 3 | 3 | 6 | 5 | 2 | 4 | 4 |
| 1289: | 5 | 6 | 7 | 6 | 1 | 0 | 4 | 6 |
| 1297: | 6 | 5 | 4 | 4 | 3 | 5 | 8 | 7 |
| 1305: | 5 | 3 | 4 | 5 | 4 | 5 | 3 | 4 |
| 1313: | 5 | 4 | 10 | 7 | 6 | 3 | 7 | 4 |
| 1321: | 6 | 3 | 2 | 2 | 6 | 7 | 5 | 4 |
| 1329: | 2 | 4 | 6 | 3 | 4 | 3 | 3 | 6 |
| 1337: | 3 | 4 | 8 | 3 | 4 | 5 | 4 | 4 |
| 1345: | 6 | 2 | 0 | 0 | 1 | 4 | 6 | 4 |
| 1353: | 5 | 3 | 1 | 2 | 2 | 3 | 2 | 2 |
| 1361: | 4 | 1 | 3 | 4 | 2 | 1 | 4 | 3 |
| 1369: | 0 | 4 | 3 | 3 | 1 | 5 | 1 | 5 |
| 1377: | 11 | 10 | 4 | 4 | 2 | 4 | 4 | 4 |
| 1385: | 8 | 5 | 1 | 1 | 5 | 3 | 3 | 2 |
| 1393: | 4 | 4 | 2 | 2 | 3 | 2 | 4 | 4 |
| 1401: | 3 | 3 | 6 | 1 | 1 | 4 | 8 | 6 |
| 1409: | 5 | 1 | 4 | 1 | 1 | 1 | 1 | 2 |
| 1417: | 5 | 2 | 2 | 2 | 4 | 3 | 1 | 2 |
| 1425: | 2 | 2 | 5 | 0 | 2 | 0 | 3 | 2 |
| 1433: | 3 | 1 | 0 | 2 | 4 | 2 | 2 | 2 |
| 1441: | 2 | 3 | 2 | 4 | 1 | 2 | 3 | 2 |
| 1449: | 2 | 3 | 2 | 1 | 5 | 4 | 6 | 4 |
| 1457: | 14 | 31 | 97 | 292 | 244 | 57 | 8 | 1 |
| 1465: | 3 | 0 | 1 | 2 | 1 | 1 | 1 | 2 |
| 1473: | 2 | 2 | 0 | 1 | 0 | 1 | 3 | 2 |
| 1481: | 4 | 1 | 1 | 0 | 1 | 2 | 5 | 1 |
| 1489: | 3 | 1 | 2 | 2 | 5 | 2 | 6 | 2 |
| 1497: | 2 | 3 | 1 | 0 | 3 | 1 | 4 | 2 |
| 1505: | 1 | 1 | 1 | 6 | 6 | 3 | 2 | 1 |
| 1513: | 0 | 1 | 0 | 1 | 3 | 1 | 1 | 2 |
| 1521: | 0 | 2 | 5 | 4 | 2 | 2 | 2 | 0 |
| 1529: | 4 | 0 | 2 | 3 | 1 | 1 | 2 | 1 |
| 1537: | 3 | 2 | 2 | 1 | 2 | 0 | 2 | 3 |
| 1545: | 0 | 5 | 1 | 1 | 1 | 0 | 0 | 0 |
| 1553: | 2 | 0 | 1 | 1 | 2 | 1 | 0 | 0 |
| 1561: | 3 | 2 | 0 | 1 | 2 | 1 | 0 | 0 |
| 1569: | 2 | 1 | 1 | 3 | 6 | 3 | 1 | 1 |
| 1577: | 2 | 4 | 3 | 4 | 4 | 1 | 2 | 4 |
| 1585: | 0 | 0 | 5 | 8 | 8 | 4 | 3 | 8 |
| 1593: | 1 | 1 | 2 | 1 | 3 | 1 | 0 | 2 |
| 1601: | 0 | 2 | 1 | 0 | 0 | 2 | 4 | 2 |
| 1609: | 1 | 2 | 1 | 3 | 1 | 2 | 3 | 1 |
| 1617: | 1 | 1 | 0 | 5 | 2 | 2 | 4 | 1 |
| 1625: | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 |
| 1633: | 2 | 2 | 1 | 4 | 2 | 1 | 2 | 2 |
| 1641: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1649: | 2 | 2 | 0 | 0 | 1 | 0 | 1 | 2 |
| 1657: | 0 | 1 | 3 | 3 | 1 | 1 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 0 | 1 | 2 | 0 | 2 | 1 | 2 | 3 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 1 |
| 1681: | 3 | 1 | 2 | 0 | 0 | 1 | 1 | 2 |
| 1689: | 0 | 2 | 0 | 1 | 3 | 1 | 1 | 0 |
| 1697: | 0 | 3 | 1 | 2 | 3 | 1 | 2 | 0 |
| 1705: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 1713: | 1 | 1 | 2 | 1 | 3 | 0 | 0 | 0 |
| 1721: | 1 | 2 | 0 | 2 | 1 | 1 | 3 | 5 |
| 1729: | 2 | 4 | 1 | 2 | 2 | 1 | 0 | 1 |
| 1737: | 1 | 0 | 0 | 1 | 0 | 2 | 2 | 0 |
| 1745: | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 |
| 1753: | 1 | 0 | 1 | 0 | 1 | 2 | 1 | 0 |
| 1761: | 3 | 10 | 17 | 25 | 17 | 2 | 0 | 0 |
| 1769: | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 1777: | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 1785: | 3 | 2 | 0 | 0 | 1 | 2 | 0 | 2 |
| 1793: | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 1801: | 2 | 3 | 0 | 0 | 2 | 1 | 3 | 0 |
| 1809: | 1 | 1 | 1 | 0 | 3 | 1 | 0 | 0 |
| 1817: | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 0 |
| 1825: | 1 | 1 | 4 | 3 | 0 | 0 | 2 | 1 |
| 1833: | 2 | 1 | 2 | 0 | 2 | 1 | 2 | 1 |
| 1841: | 0 | 0 | 3 | 0 | 0 | 0 | 5 | 2 |
| 1849: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1857: | 5 | 2 | 2 | 2 | 1 | 2 | 0 | 0 |
| 1865: | 1 | 0 | 0 | 1 | 3 | 1 | 2 | 2 |
| 1873: | 2 | 0 | 2 | 2 | 2 | 2 | 1 | 1 |
| 1881: | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 3 |
| 1889: | 0 | 2 | 2 | 1 | 0 | 1 | 1 | 1 |
| 1897: | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 0 |
| 1905: | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 |
| 1913: | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 1921: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 3 |
| 1929: | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 0 |
| 1937: | 1 | 0 | 3 | 0 | 1 | 0 | 0 | 1 |
| 1945: | 2 | 0 | 0 | 2 | 1 | 0 | 3 | 0 |
| 1953: | 3 | 2 | 0 | 1 | 2 | 0 | 1 | 1 |
| 1961: | 0 | 1 | 1 | 0 | 2 | 1 | 2 | 0 |
| 1969: | 1 | 1 | 1 | 3 | 0 | 0 | 0 | 0 |
| 1977: | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 1985: | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 1993: | 4 | 2 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2001: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2009: | 1 | 0 | 4 | 0 | 0 | 1 | 0 | 2 |
| 2017: | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 |
| 2025: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 |
| 2033: | 0 | 1 | 0 | 1 | 0 | 0 | 3 | 0 |
| 2041: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2049: | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 0 |
| 2057: | 0 | 1 | 2 | 1 | 2 | 2 | 0 | 2 |
| 2065: | 1 | 0 | 0 | 0 | 0 | 2 | 2 | 0 |
| 2073: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 2081: | 1 | 4 | 2 | 1 | 1 | 1 | 1 | 1 |
| 2089: | 0 | 1 | 2 | 2 | 0 | 1 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 3 | 1 | 1 | 3 | 3 | 5 | 3 | 6 |

Sample Title: HTC-A03-S002-3642-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 3 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| 2113: | 0 | 1 | 1 | 3 | 3 | 0 | 2 | 2 |
| 2121: | 2 | 1 | 2 | 1 | 1 | 0 | 1 | 1 |
| 2129: | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 |
| 2137: | 1 | 0 | 2 | 3 | 0 | 0 | 0 | 0 |
| 2145: | 1 | 0 | 2 | 3 | 1 | 0 | 1 | 1 |
| 2153: | 1 | 0 | 2 | 0 | 0 | 2 | 1 | 2 |
| 2161: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 3 |
| 2169: | 2 | 1 | 0 | 0 | 2 | 3 | 0 | 0 |
| 2177: | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 2 |
| 2185: | 0 | 1 | 1 | 0 | 2 | 0 | 3 | 2 |
| 2193: | 3 | 0 | 0 | 1 | 1 | 2 | 0 | 1 |
| 2201: | 1 | 3 | 6 | 5 | 6 | 2 | 2 | 0 |
| 2209: | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2217: | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 |
| 2225: | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2233: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 |
| 2241: | 0 | 1 | 0 | 1 | 0 | 5 | 1 | 1 |
| 2249: | 1 | 0 | 1 | 1 | 1 | 2 | 0 | 1 |
| 2257: | 1 | 1 | 0 | 0 | 1 | 0 | 3 | 1 |
| 2265: | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 2 |
| 2273: | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 |
| 2281: | 0 | 1 | 0 | 0 | 1 | 2 | 2 | 1 |
| 2289: | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 2 |
| 2297: | 0 | 1 | 2 | 0 | 2 | 0 | 0 | 1 |
| 2305: | 1 | 0 | 0 | 0 | 2 | 1 | 1 | 2 |
| 2313: | 2 | 2 | 1 | 1 | 2 | 1 | 4 | 2 |
| 2321: | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 2 |
| 2329: | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2337: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 2345: | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 2353: | 2 | 1 | 0 | 0 | 1 | 1 | 1 | 2 |
| 2361: | 0 | 1 | 2 | 1 | 0 | 1 | 2 | 1 |
| 2369: | 2 | 2 | 0 | 1 | 1 | 0 | 1 | 0 |
| 2377: | 0 | 3 | 3 | 0 | 0 | 1 | 0 | 1 |
| 2385: | 3 | 1 | 0 | 1 | 1 | 0 | 1 | 2 |
| 2393: | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 |
| 2401: | 4 | 1 | 1 | 1 | 1 | 2 | 1 | 0 |
| 2409: | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 2417: | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2425: | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 |
| 2433: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2441: | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 1 |
| 2449: | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 |
| 2457: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |
| 2465: | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0 |
| 2473: | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2489: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2497: | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2505: | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 1 |
| 2513: | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 |
| 2521: | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2545: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2553: | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 0 |
| 2561: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| 2569: | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 2577: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2585: | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 0 |
| 2593: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| 2601: | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 2 |
| 2609: | 2 | 3 | 7 | 19 | 20 | 32 | 8 | 3 |
| 2617: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2625: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2649: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2673: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2689: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 2697: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2713: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2721: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2745: | 1 | 0 | 3 | 0 | 2 | 0 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2777: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2785: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2793: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2809: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |
| 2817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 2841: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2865: | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 2873: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2881: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2889: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2897: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2905: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2929: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2977: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2993: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3001: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3017: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3025: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3081: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 3089: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3105: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3121: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| 3145: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3153: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3161: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3169: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3193: | 0 | 1 | 0 | 2 | 0 | 0 | 1 | 1 |
| 3201: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3233: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3241: | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3249: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3297: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3337: | 0 | 2 | 1 | 0 | 1 | 1 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3369: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3385: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3409: | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3425: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3521: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3609: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3753: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3769: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3777: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3785: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3817: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 |

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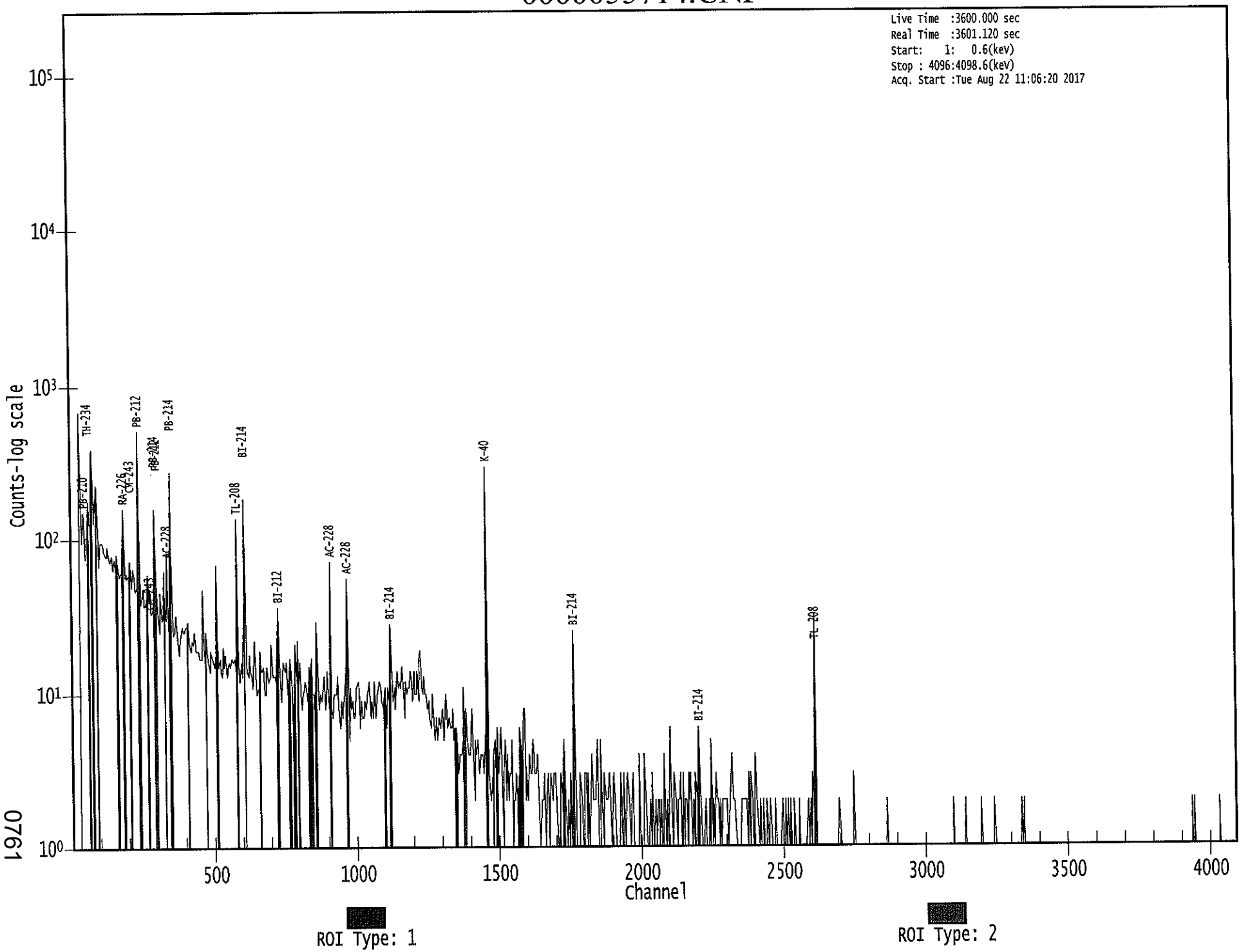
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3873: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3881: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3945: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 4009: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# 0000055714.CNF




0761

KLP 8/22/17

Apex-Gamma

Analysis Report for 1707087-14
HTC-A03-S002-4248-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-14 |
| Sample Description | : HTC-A03-S002-4248-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.738E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:45:23AM |
| Acquisition Started | : 8/22/2017 11:06:27AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE3 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3608.0 seconds |
| Dead Time | : 0.22 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 9 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55715 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG 8/23/17

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 12:07:28PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 39.32 | 39.64 | 0.0000 | 0.00 |
| 2 | 46.57 | 46.88 | 0.0000 | 0.00 |
| 3 | 63.66 | 63.97 | 0.0000 | 0.00 |
| 4 | 76.25 | 76.55 | 0.0000 | 0.00 |
| 5 | 92.98 | 93.28 | 0.0000 | 0.00 |
| 6 | 129.88 | 130.17 | 0.0000 | 0.00 |
| 7 | 145.76 | 146.04 | 0.0000 | 0.00 |
| 8 | 186.63 | 186.89 | 0.0000 | 0.00 |
| 9 | 238.97 | 239.22 | 0.0000 | 0.00 |
| 10 | 242.05 | 242.29 | 0.0000 | 0.00 |
| 11 | 270.24 | 270.48 | 0.0000 | 0.00 |
| 12 | 279.38 | 279.61 | 0.0000 | 0.00 |
| 13 | 295.63 | 295.86 | 0.0000 | 0.00 |
| 14 | 300.60 | 300.82 | 0.0000 | 0.00 |
| 15 | 338.84 | 339.05 | 0.0000 | 0.00 |
| 16 | 352.33 | 352.54 | 0.0000 | 0.00 |
| 17 | 463.50 | 463.67 | 0.0000 | 0.00 |
| 18 | 511.17 | 511.33 | 0.0000 | 0.00 |
| 19 | 536.44 | 536.59 | 0.0000 | 0.00 |
| 20 | 583.62 | 583.75 | 0.0000 | 0.00 |
| 21 | 609.55 | 609.67 | 0.0000 | 0.00 |
| 22 | 661.77 | 661.87 | 0.0000 | 0.00 |
| 23 | 665.70 | 665.80 | 0.0000 | 0.00 |
| 24 | 727.41 | 727.49 | 0.0000 | 0.00 |
| 25 | 769.09 | 769.16 | 0.0000 | 0.00 |
| 26 | 851.81 | 851.85 | 0.0000 | 0.00 |
| 27 | 860.17 | 860.20 | 0.0000 | 0.00 |
| 28 | 903.84 | 903.86 | 0.0000 | 0.00 |
| 29 | 911.21 | 911.23 | 0.0000 | 0.00 |
| 30 | 969.59 | 969.59 | 0.0000 | 0.00 |
| 31 | 1120.95 | 1120.90 | 0.0000 | 0.00 |
| 32 | 1216.60 | 1216.52 | 0.0000 | 0.00 |
| 33 | 1238.58 | 1238.49 | 0.0000 | 0.00 |
| 34 | 1402.56 | 1402.42 | 0.0000 | 0.00 |
| 35 | 1460.88 | 1460.71 | 0.0000 | 0.00 |
| 36 | 1508.63 | 1508.45 | 0.0000 | 0.00 |
| 37 | 1644.83 | 1644.60 | 0.0000 | 0.00 |
| 38 | 1727.06 | 1726.81 | 0.0000 | 0.00 |
| 39 | 1730.01 | 1729.76 | 0.0000 | 0.00 |
| 40 | 1765.08 | 1764.82 | 0.0000 | 0.00 |
| 41 | 1776.27 | 1776.00 | 0.0000 | 0.00 |
| 42 | 1940.07 | 1939.75 | 0.0000 | 0.00 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 2204.07 | 2203.65 | 0.0000 | 0.00 |
| 44 | 2340.40 | 2339.93 | 0.0000 | 0.00 |
| 45 | 2373.57 | 2373.10 | 0.0000 | 0.00 |
| 46 | 2405.49 | 2405.00 | 0.0000 | 0.00 |
| 47 | 2413.44 | 2412.95 | 0.0000 | 0.00 |
| 48 | 2614.41 | 2613.86 | 0.0000 | 0.00 |
| 49 | 2738.02 | 2737.43 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 12:07:28PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 39.32 | 37 - | 42 | 39.64 | 8.97E+01 | 70.45 | 9.21E+02 | 3.25 |
| | 2 | 46.57 | 44 - | 50 | 46.88 | 1.20E+02 | 88.36 | 1.34E+03 | 1.34 |
| | 3 | 63.66 | 59 - | 68 | 63.97 | 2.07E+02 | 136.91 | 2.56E+03 | 2.37 |
| | 4 | 76.25 | 71 - | 80 | 76.55 | 1.13E+03 | 147.68 | 2.46E+03 | 3.88 |
| | 5 | 92.98 | 90 - | 97 | 93.28 | 3.03E+02 | 110.15 | 1.76E+03 | 2.65 |
| | 6 | 129.88 | 127 - | 133 | 130.17 | 7.11E+01 | 77.16 | 1.03E+03 | 3.17 |
| | 7 | 145.76 | 143 - | 149 | 146.04 | 7.57E+01 | 74.87 | 9.55E+02 | 4.33 |
| | 8 | 186.63 | 183 - | 190 | 186.89 | 1.78E+02 | 79.92 | 9.33E+02 | 1.83 |
| M | 9 | 238.97 | 234 - | 247 | 239.22 | 7.86E+02 | 73.41 | 4.19E+02 | 2.06 |
| m | 10 | 242.05 | 234 - | 247 | 242.29 | 1.50E+02 | 73.19 | 3.90E+02 | 2.06 |
| | 11 | 270.24 | 267 - | 274 | 270.48 | 7.22E+01 | 56.53 | 4.86E+02 | 1.66 |
| | 12 | 279.38 | 276 - | 283 | 279.61 | 5.16E+01 | 52.65 | 4.27E+02 | 2.05 |
| M | 13 | 295.63 | 293 - | 303 | 295.86 | 2.38E+02 | 51.61 | 3.40E+02 | 1.92 |
| m | 14 | 300.60 | 293 - | 303 | 300.82 | 4.60E+01 | 44.27 | 3.69E+02 | 1.93 |
| | 15 | 338.84 | 334 - | 344 | 339.05 | 1.59E+02 | 67.33 | 5.12E+02 | 2.30 |
| | 16 | 352.33 | 348 - | 357 | 352.54 | 3.77E+02 | 67.43 | 4.31E+02 | 2.13 |
| | 17 | 463.50 | 460 - | 466 | 463.67 | 4.94E+01 | 35.98 | 1.93E+02 | 2.34 |
| | 18 | 511.17 | 505 - | 515 | 511.33 | 1.18E+02 | 51.12 | 2.85E+02 | 2.85 |
| | 19 | 536.44 | 531 - | 542 | 536.59 | 4.20E+01 | 46.73 | 2.52E+02 | 8.57 |
| | 20 | 583.62 | 579 - | 589 | 583.75 | 2.21E+02 | 51.91 | 2.41E+02 | 2.03 |
| | 21 | 609.55 | 605 - | 615 | 609.67 | 2.94E+02 | 57.56 | 2.83E+02 | 2.29 |
| M | 22 | 661.77 | 658 - | 668 | 661.87 | 2.97E+01 | 30.29 | 1.38E+02 | 2.19 |
| m | 23 | 665.70 | 658 - | 668 | 665.80 | 1.93E+01 | 21.90 | 8.83E+01 | 2.19 |
| | 24 | 727.41 | 723 - | 731 | 727.49 | 3.74E+01 | 36.25 | 1.77E+02 | 2.34 |
| | 25 | 769.09 | 764 - | 774 | 769.16 | 6.85E+01 | 37.78 | 1.53E+02 | 1.84 |
| | 26 | 851.81 | 848 - | 855 | 851.85 | 2.76E+01 | 24.25 | 7.88E+01 | 3.55 |
| | 27 | 860.17 | 856 - | 864 | 860.20 | 2.69E+01 | 27.96 | 1.04E+02 | 2.15 |
| M | 28 | 903.84 | 899 - | 916 | 903.86 | 2.37E+01 | 27.68 | 9.66E+01 | 3.40 |
| m | 29 | 911.21 | 899 - | 916 | 911.23 | 1.29E+02 | 31.24 | 7.02E+01 | 2.53 |
| | 30 | 969.59 | 966 - | 972 | 969.59 | 5.64E+01 | 31.34 | 1.33E+02 | 2.23 |
| | 31 | 1120.95 | 1115 - | 1125 | 1120.90 | 7.99E+01 | 37.29 | 1.42E+02 | 2.67 |
| | 32 | 1216.60 | 1214 - | 1219 | 1216.52 | 1.85E+01 | 20.78 | 7.09E+01 | 1.47 |
| | 33 | 1238.58 | 1236 - | 1241 | 1238.49 | 1.83E+01 | 23.77 | 9.74E+01 | 1.70 |
| | 34 | 1402.56 | 1398 - | 1406 | 1402.42 | 1.74E+01 | 16.55 | 3.12E+01 | 1.80 |
| | 35 | 1460.88 | 1455 - | 1465 | 1460.71 | 6.77E+02 | 52.44 | 5.29E+00 | 2.72 |
| | 36 | 1508.63 | 1505 - | 1512 | 1508.45 | 1.33E+01 | 11.14 | 1.14E+01 | 3.01 |
| | 37 | 1644.83 | 1640 - | 1647 | 1644.60 | 1.01E+01 | 9.38 | 7.86E+00 | 2.55 |
| M | 38 | 1727.06 | 1724 - | 1734 | 1726.81 | 6.25E+00 | 7.62 | 6.00E+00 | 3.24 |
| m | 39 | 1730.01 | 1724 - | 1734 | 1729.76 | 1.15E+01 | 10.39 | 8.00E+00 | 2.68 |
| | 40 | 1765.08 | 1760 - | 1771 | 1764.82 | 4.86E+01 | 18.33 | 1.68E+01 | 2.30 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|
| 41 | 1776.27 | 1773 - | 1779 | 1776.00 | 5.50E+00 | 7.78 | 7.00E+00 | 2.50 |
| 42 | 1940.07 | 1938 - | 1942 | 1939.75 | 4.42E+00 | 5.50 | 3.17E+00 | 2.56 |
| 43 | 2204.07 | 2199 - | 2208 | 2203.65 | 1.54E+01 | 12.92 | 1.53E+01 | 2.68 |
| 44 | 2340.40 | 2337 - | 2342 | 2339.93 | 4.50E+00 | 5.74 | 3.00E+00 | 2.70 |
| 45 | 2373.57 | 2370 - | 2376 | 2373.10 | 1.00E+01 | 6.32 | 0.00E+00 | 3.06 |
| 46 | 2405.49 | 2401 - | 2408 | 2405.00 | 9.05E+00 | 7.75 | 3.91E+00 | 2.70 |
| 47 | 2413.44 | 2409 - | 2417 | 2412.95 | 9.50E+00 | 9.82 | 9.00E+00 | 1.01 |
| 48 | 2614.41 | 2609 - | 2617 | 2613.86 | 5.59E+01 | 15.88 | 4.12E+00 | 2.27 |
| 49 | 2738.02 | 2732 - | 2740 | 2737.43 | 7.00E+00 | 5.29 | 0.00E+00 | 2.74 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 12:07:28PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 39.32 | 37 - | 42 | 8.97E+01 | 70.45 | 9.21E+02 | 5.58E+01 |
| | 2 | 46.57 | 44 - | 50 | 1.20E+02 | 88.36 | 1.34E+03 | 7.04E+01 |
| | 3 | 63.66 | 59 - | 68 | 2.07E+02 | 136.91 | 2.56E+03 | 1.10E+02 |
| | 4 | 76.25 | 71 - | 80 | 1.13E+03 | 147.68 | 2.46E+03 | 1.08E+02 |
| | 5 | 92.98 | 90 - | 97 | 3.03E+02 | 110.15 | 1.76E+03 | 8.59E+01 |
| | 6 | 129.88 | 127 - | 133 | 7.11E+01 | 77.16 | 1.03E+03 | 6.19E+01 |
| | 7 | 145.76 | 143 - | 149 | 7.57E+01 | 74.87 | 9.55E+02 | 5.99E+01 |
| | 8 | 186.63 | 183 - | 190 | 1.78E+02 | 79.92 | 9.33E+02 | 6.19E+01 |
| M | 9 | 238.97 | 234 - | 247 | 7.86E+02 | 73.41 | 4.19E+02 | 3.37E+01 |
| m | 10 | 242.05 | 234 - | 247 | 1.50E+02 | 73.19 | 3.90E+02 | 3.25E+01 |
| | 11 | 270.24 | 267 - | 274 | 7.22E+01 | 56.53 | 4.86E+02 | 4.43E+01 |
| | 12 | 279.38 | 276 - | 283 | 5.16E+01 | 52.65 | 4.27E+02 | 4.16E+01 |
| M | 13 | 295.63 | 293 - | 303 | 2.38E+02 | 51.61 | 3.40E+02 | 3.03E+01 |
| m | 14 | 300.60 | 293 - | 303 | 4.60E+01 | 44.27 | 3.69E+02 | 3.16E+01 |
| | 15 | 338.84 | 334 - | 344 | 1.59E+02 | 67.33 | 5.12E+02 | 5.13E+01 |
| | 16 | 352.33 | 348 - | 357 | 3.77E+02 | 67.43 | 4.31E+02 | 4.53E+01 |
| | 17 | 463.50 | 460 - | 466 | 4.94E+01 | 35.98 | 1.93E+02 | 2.72E+01 |
| | 18 | 511.17 | 505 - | 515 | 1.18E+02 | 51.12 | 2.85E+02 | 3.80E+01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 19 | 536.44 | 531 - | 542 | 4.20E+01 | 46.73 | 2.52E+02 | 3.69E+01 |
| | 20 | 583.62 | 579 - | 589 | 2.21E+02 | 51.91 | 2.41E+02 | 3.50E+01 |
| | 21 | 609.55 | 605 - | 615 | 2.94E+02 | 57.56 | 2.83E+02 | 3.80E+01 |
| M | 22 | 661.77 | 658 - | 668 | 2.97E+01 | 30.29 | 1.38E+02 | 1.93E+01 |
| m | 23 | 665.70 | 658 - | 668 | 1.93E+01 | 21.90 | 8.83E+01 | 1.54E+01 |
| | 24 | 727.41 | 723 - | 731 | 3.74E+01 | 36.25 | 1.77E+02 | 2.80E+01 |
| | 25 | 769.09 | 764 - | 774 | 6.85E+01 | 37.78 | 1.53E+02 | 2.79E+01 |
| | 26 | 851.81 | 848 - | 855 | 2.76E+01 | 24.25 | 7.88E+01 | 1.80E+01 |
| | 27 | 860.17 | 856 - | 864 | 2.69E+01 | 27.96 | 1.04E+02 | 2.13E+01 |
| M | 28 | 903.84 | 899 - | 916 | 2.37E+01 | 27.68 | 9.66E+01 | 1.62E+01 |
| m | 29 | 911.21 | 899 - | 916 | 1.29E+02 | 31.24 | 7.02E+01 | 1.38E+01 |
| | 30 | 969.59 | 966 - | 972 | 5.64E+01 | 31.34 | 1.33E+02 | 2.26E+01 |
| | 31 | 1120.95 | 1115 - | 1125 | 7.99E+01 | 37.29 | 1.42E+02 | 2.69E+01 |
| | 32 | 1216.60 | 1214 - | 1219 | 1.85E+01 | 20.78 | 7.09E+01 | 1.55E+01 |
| | 33 | 1238.58 | 1236 - | 1241 | 1.83E+01 | 23.77 | 9.74E+01 | 1.82E+01 |
| | 34 | 1402.56 | 1398 - | 1406 | 1.74E+01 | 16.55 | 3.12E+01 | 1.17E+01 |
| | 35 | 1460.88 | 1455 - | 1465 | 6.77E+02 | 52.44 | 5.29E+00 | 5.25E+00 |
| | 36 | 1508.63 | 1505 - | 1512 | 1.33E+01 | 11.14 | 1.14E+01 | 6.91E+00 |
| | 37 | 1644.83 | 1640 - | 1647 | 1.01E+01 | 9.38 | 7.86E+00 | 5.68E+00 |
| M | 38 | 1727.06 | 1724 - | 1734 | 6.25E+00 | 7.62 | 6.00E+00 | 4.03E+00 |
| m | 39 | 1730.01 | 1724 - | 1734 | 1.15E+01 | 10.39 | 8.00E+00 | 4.65E+00 |
| | 40 | 1765.08 | 1760 - | 1771 | 4.86E+01 | 18.33 | 1.68E+01 | 9.78E+00 |
| | 41 | 1776.27 | 1773 - | 1779 | 5.50E+00 | 7.78 | 7.00E+00 | 5.10E+00 |
| | 42 | 1940.07 | 1938 - | 1942 | 4.42E+00 | 5.50 | 3.17E+00 | 2.92E+00 |
| | 43 | 2204.07 | 2199 - | 2208 | 1.54E+01 | 12.92 | 1.53E+01 | 8.44E+00 |
| | 44 | 2340.40 | 2337 - | 2342 | 4.50E+00 | 5.74 | 3.00E+00 | 3.18E+00 |
| | 45 | 2373.57 | 2370 - | 2376 | 1.00E+01 | 6.32 | 0.00E+00 | 0.00E+00 |
| | 46 | 2405.49 | 2401 - | 2408 | 9.05E+00 | 7.75 | 3.91E+00 | 4.01E+00 |
| | 47 | 2413.44 | 2409 - | 2417 | 9.50E+00 | 9.82 | 9.00E+00 | 6.29E+00 |
| | 48 | 2614.41 | 2609 - | 2617 | 5.59E+01 | 15.88 | 4.12E+00 | 4.39E+00 |
| | 49 | 2738.02 | 2732 - | 2740 | 7.00E+00 | 5.29 | 0.00E+00 | 0.00E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 12:07:28PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 39.32 | 37 - | 42 | 39.64 | 8.97E+01 | 70.45 | 9.21E+02 | I-129 |
| | | | | | | | | | RA-225 |
| | 2 | 46.57 | 44 - | 50 | 46.88 | 1.20E+02 | 88.36 | 1.34E+03 | PB-210 |
| | 3 | 63.66 | 59 - | 68 | 63.97 | 2.07E+02 | 136.91 | 2.56E+03 | TH-234 |
| | | | | | | | | | TH-230 |
| | 4 | 76.25 | 71 - | 80 | 76.55 | 1.13E+03 | 147.68 | 2.46E+03 | ..... |
| | 5 | 92.98 | 90 - | 97 | 93.28 | 3.03E+02 | 110.15 | 1.76E+03 | GA-67 |
| | 6 | 129.88 | 127 - | 133 | 130.17 | 7.11E+01 | 77.16 | 1.03E+03 | ..... |
| | 7 | 145.76 | 143 - | 149 | 146.04 | 7.57E+01 | 74.87 | 9.55E+02 | CE-141 |
| | 8 | 186.63 | 183 - | 190 | 186.89 | 1.78E+02 | 79.92 | 9.33E+02 | RA-226 |
| M | 9 | 238.97 | 234 - | 247 | 239.22 | 7.86E+02 | 73.41 | 4.19E+02 | PB-212 |
| m | 10 | 242.05 | 234 - | 247 | 242.29 | 1.50E+02 | 73.19 | 3.90E+02 | ..... |
| | 11 | 270.24 | 267 - | 274 | 270.48 | 7.22E+01 | 56.53 | 4.86E+02 | ..... |
| | 12 | 279.38 | 276 - | 283 | 279.61 | 5.16E+01 | 52.65 | 4.27E+02 | SE-75 |
| | | | | | | | | | HG-203 |
| M | 13 | 295.63 | 293 - | 303 | 295.86 | 2.38E+02 | 51.61 | 3.40E+02 | PB-214 |
| m | 14 | 300.60 | 293 - | 303 | 300.82 | 4.60E+01 | 44.27 | 3.69E+02 | GA-67 |
| | | | | | | | | | PB-212 |
| | | | | | | | | | BI-210M |
| | 15 | 338.84 | 334 - | 344 | 339.05 | 1.59E+02 | 67.33 | 5.12E+02 | AC-228 |
| | 16 | 352.33 | 348 - | 357 | 352.54 | 3.77E+02 | 67.43 | 4.31E+02 | PB-214 |
| | 17 | 463.50 | 460 - | 466 | 463.67 | 4.94E+01 | 35.98 | 1.93E+02 | SB-125 |
| | 18 | 511.17 | 505 - | 515 | 511.33 | 1.18E+02 | 51.12 | 2.85E+02 | ..... |
| | 19 | 536.44 | 531 - | 542 | 536.59 | 4.20E+01 | 46.73 | 2.52E+02 | BA-140 |
| | 20 | 583.62 | 579 - | 589 | 583.75 | 2.21E+02 | 51.91 | 2.41E+02 | TL-208 |
| | 21 | 609.55 | 605 - | 615 | 609.67 | 2.94E+02 | 57.56 | 2.83E+02 | BI-214 |
| M | 22 | 661.77 | 658 - | 668 | 661.87 | 2.97E+01 | 30.29 | 1.38E+02 | CS-137 |
| m | 23 | 665.70 | 658 - | 668 | 665.80 | 1.93E+01 | 21.90 | 8.83E+01 | SB-126 |
| | 24 | 727.41 | 723 - | 731 | 727.49 | 3.74E+01 | 36.25 | 1.77E+02 | BI-212 |
| | 25 | 769.09 | 764 - | 774 | 769.16 | 6.85E+01 | 37.78 | 1.53E+02 | ..... |
| | 26 | 851.81 | 848 - | 855 | 851.85 | 2.76E+01 | 24.25 | 7.88E+01 | ..... |
| | 27 | 860.17 | 856 - | 864 | 860.20 | 2.69E+01 | 27.96 | 1.04E+02 | TL-208 |
| M | 28 | 903.84 | 899 - | 916 | 903.86 | 2.37E+01 | 27.68 | 9.66E+01 | ..... |
| m | 29 | 911.21 | 899 - | 916 | 911.23 | 1.29E+02 | 31.24 | 7.02E+01 | AC-228 |
| | | | | | | | | | TL-204 |
| | 30 | 969.59 | 966 - | 972 | 969.59 | 5.64E+01 | 31.34 | 1.33E+02 | AC-228 |
| | 31 | 1120.95 | 1115 - | 1125 | 1120.90 | 7.99E+01 | 37.29 | 1.42E+02 | TA-182 |
| | | | | | | | | | SC-46 |
| | | | | | | | | | BI-214 |
| | 32 | 1216.60 | 1214 - | 1219 | 1216.52 | 1.85E+01 | 20.78 | 7.09E+01 | ..... |
| | 33 | 1238.58 | 1236 - | 1241 | 1238.49 | 1.83E+01 | 23.77 | 9.74E+01 | CO-56 |
| | 34 | 1402.56 | 1398 - | 1406 | 1402.42 | 1.74E+01 | 16.55 | 3.12E+01 | ..... |
| | 35 | 1460.88 | 1455 - | 1465 | 1460.71 | 6.77E+02 | 52.44 | 5.29E+00 | K-40 |
| | 36 | 1508.63 | 1505 - | 1512 | 1508.45 | 1.33E+01 | 11.14 | 1.14E+01 | ..... |
| | 37 | 1644.83 | 1640 - | 1647 | 1644.60 | 1.01E+01 | 9.38 | 7.86E+00 | ..... |
| M | 38 | 1727.06 | 1724 - | 1734 | 1726.81 | 6.25E+00 | 7.62 | 6.00E+00 | ..... |
| m | 39 | 1730.01 | 1724 - | 1734 | 1729.76 | 1.15E+01 | 10.39 | 8.00E+00 | ..... |
| | 40 | 1765.08 | 1760 - | 1771 | 1764.82 | 4.86E+01 | 18.33 | 1.68E+01 | BI-214 |
| | 41 | 1776.27 | 1773 - | 1779 | 1776.00 | 5.50E+00 | 7.78 | 7.00E+00 | ..... |
| | 42 | 1940.07 | 1938 - | 1942 | 1939.75 | 4.42E+00 | 5.50 | 3.17E+00 | ..... |
| | 43 | 2204.07 | 2199 - | 2208 | 2203.65 | 1.54E+01 | 12.92 | 1.53E+01 | BI-214 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|
| 44 | 2340.40 | 2337 - | 2342 | 2339.93 | 4.50E+00 | 5.74 | 3.00E+00 | ..... |
| 45 | 2373.57 | 2370 - | 2376 | 2373.10 | 1.00E+01 | 6.32 | 0.00E+00 | ..... |
| 46 | 2405.49 | 2401 - | 2408 | 2405.00 | 9.05E+00 | 7.75 | 3.91E+00 | ..... |
| 47 | 2413.44 | 2409 - | 2417 | 2412.95 | 9.50E+00 | 9.82 | 9.00E+00 | ..... |
| 48 | 2614.41 | 2609 - | 2617 | 2613.86 | 5.59E+01 | 15.88 | 4.12E+00 | TL-208 |
| 49 | 2738.02 | 2732 - | 2740 | 2737.43 | 7.00E+00 | 5.29 | 0.00E+00 | ..... |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 12:07:28PM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 39.32 | 8.97E+01 | 70.45 | 1.24E-02 | 1.73E-03 |
| | 2 | 46.57 | 1.20E+02 | 88.36 | 1.73E-02 | 1.73E-03 |
| | 3 | 63.66 | 2.07E+02 | 136.91 | 2.45E-02 | 1.80E-03 |
| | 4 | 76.25 | 1.13E+03 | 147.68 | 2.66E-02 | 2.04E-03 |
| | 5 | 92.98 | 3.03E+02 | 110.15 | 2.71E-02 | 2.24E-03 |
| | 6 | 129.88 | 7.11E+01 | 77.16 | 2.45E-02 | 2.03E-03 |
| | 7 | 145.76 | 7.57E+01 | 74.87 | 2.30E-02 | 1.85E-03 |
| | 8 | 186.63 | 1.78E+02 | 79.92 | 1.95E-02 | 1.55E-03 |
| M | 9 | 238.97 | 7.86E+02 | 73.41 | 1.61E-02 | 1.34E-03 |
| m | 10 | 242.05 | 1.50E+02 | 73.19 | 1.59E-02 | 1.33E-03 |
| | 11 | 270.24 | 7.22E+01 | 56.53 | 1.45E-02 | 1.21E-03 |
| | 12 | 279.38 | 5.16E+01 | 52.65 | 1.41E-02 | 1.18E-03 |
| M | 13 | 295.63 | 2.38E+02 | 51.61 | 1.35E-02 | 1.15E-03 |
| m | 14 | 300.60 | 4.60E+01 | 44.27 | 1.33E-02 | 1.14E-03 |
| | 15 | 338.84 | 1.59E+02 | 67.33 | 1.19E-02 | 1.06E-03 |
| | 16 | 352.33 | 3.77E+02 | 67.43 | 1.15E-02 | 1.03E-03 |
| | 17 | 463.50 | 4.94E+01 | 35.98 | 9.01E-03 | 8.57E-04 |
| | 18 | 511.17 | 1.18E+02 | 51.12 | 8.25E-03 | 7.94E-04 |
| | 19 | 536.44 | 4.20E+01 | 46.73 | 7.90E-03 | 7.61E-04 |
| | 20 | 583.62 | 2.21E+02 | 51.91 | 7.32E-03 | 6.98E-04 |
| | 21 | 609.55 | 2.94E+02 | 57.56 | 7.04E-03 | 6.64E-04 |
| M | 22 | 661.77 | 2.97E+01 | 30.29 | 6.54E-03 | 5.94E-04 |
| m | 23 | 665.70 | 1.93E+01 | 21.90 | 6.50E-03 | 5.91E-04 |
| | 24 | 727.41 | 3.74E+01 | 36.25 | 6.01E-03 | 5.37E-04 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 25 | 769.09 | 6.85E+01 | 37.78 | 5.72E-03 | 5.00E-04 |
| | 26 | 851.81 | 2.76E+01 | 24.25 | 5.22E-03 | 4.27E-04 |
| | 27 | 860.17 | 2.69E+01 | 27.96 | 5.18E-03 | 4.19E-04 |
| M | 28 | 903.84 | 2.37E+01 | 27.68 | 4.96E-03 | 3.85E-04 |
| m | 29 | 911.21 | 1.29E+02 | 31.24 | 4.92E-03 | 3.84E-04 |
| | 30 | 969.59 | 5.64E+01 | 31.34 | 4.66E-03 | 3.74E-04 |
| | 31 | 1120.95 | 7.99E+01 | 37.29 | 4.12E-03 | 3.49E-04 |
| | 32 | 1216.60 | 1.85E+01 | 20.78 | 3.84E-03 | 3.29E-04 |
| | 33 | 1238.58 | 1.83E+01 | 23.77 | 3.78E-03 | 3.22E-04 |
| | 34 | 1402.56 | 1.74E+01 | 16.55 | 3.42E-03 | 2.84E-04 |
| | 35 | 1460.88 | 6.77E+02 | 52.44 | 3.31E-03 | 2.75E-04 |
| | 36 | 1508.63 | 1.33E+01 | 11.14 | 3.23E-03 | 2.67E-04 |
| | 37 | 1644.83 | 1.01E+01 | 9.38 | 3.02E-03 | 2.46E-04 |
| M | 38 | 1727.06 | 6.25E+00 | 7.62 | 2.91E-03 | 2.32E-04 |
| m | 39 | 1730.01 | 1.15E+01 | 10.39 | 2.91E-03 | 2.32E-04 |
| | 40 | 1765.08 | 4.86E+01 | 18.33 | 2.86E-03 | 2.26E-04 |
| | 41 | 1776.27 | 5.50E+00 | 7.78 | 2.85E-03 | 2.25E-04 |
| | 42 | 1940.07 | 4.42E+00 | 5.50 | 2.68E-03 | 2.15E-04 |
| | 43 | 2204.07 | 1.54E+01 | 12.92 | 2.46E-03 | 2.15E-04 |
| | 44 | 2340.40 | 4.50E+00 | 5.74 | 2.38E-03 | 2.15E-04 |
| | 45 | 2373.57 | 1.00E+01 | 6.32 | 2.36E-03 | 2.15E-04 |
| | 46 | 2405.49 | 9.05E+00 | 7.75 | 2.34E-03 | 2.15E-04 |
| | 47 | 2413.44 | 9.50E+00 | 9.82 | 2.34E-03 | 2.15E-04 |
| | 48 | 2614.41 | 5.59E+01 | 15.88 | 2.24E-03 | 2.15E-04 |
| | 49 | 2738.02 | 7.00E+00 | 5.29 | 2.19E-03 | 2.15E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 12:07:28PM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055575.CNF

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|
| 1 | 39.32 | 8.97E+01 | 70.45 | | | 8.97E+01 | 7.04E+01 |
| 2 | 46.57 | 1.20E+02 | 88.36 | 4.47E+01 | 1.09E+01 | 7.55E+01 | 8.90E+01 |
| 3 | 63.66 | 2.07E+02 | 136.91 | 4.12E+01 | 5.67E+00 | 1.66E+02 | 1.37E+02 |
| 4 | 76.25 | 1.13E+03 | 147.68 | | | 1.13E+03 | 1.48E+02 |
| 5 | 92.98 | 3.03E+02 | 110.15 | 7.98E+01 | 7.31E+00 | 2.23E+02 | 1.10E+02 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 6 | 129.88 | 7.11E+01 | 77.16 | | | 7.11E+01 | 7.72E+01 |
| | 7 | 145.76 | 7.57E+01 | 74.87 | | | 7.57E+01 | 7.49E+01 |
| | 8 | 186.63 | 1.78E+02 | 79.92 | 3.06E+01 | 5.82E+00 | 1.48E+02 | 8.01E+01 |
| M | 9 | 238.97 | 7.86E+02 | 73.41 | 1.40E+01 | 2.71E+00 | 7.72E+02 | 7.35E+01 |
| m | 10 | 242.05 | 1.50E+02 | 73.19 | | | 1.50E+02 | 7.32E+01 |
| | 11 | 270.24 | 7.22E+01 | 56.53 | | | 7.22E+01 | 5.65E+01 |
| | 12 | 279.38 | 5.16E+01 | 52.65 | | | 5.16E+01 | 5.26E+01 |
| M | 13 | 295.63 | 2.38E+02 | 51.61 | | | 2.38E+02 | 5.16E+01 |
| m | 14 | 300.60 | 4.60E+01 | 44.27 | | | 4.60E+01 | 4.43E+01 |
| | 15 | 338.84 | 1.59E+02 | 67.33 | | | 1.59E+02 | 6.73E+01 |
| | 16 | 352.33 | 3.77E+02 | 67.43 | 6.53E+00 | 4.43E+00 | 3.71E+02 | 6.76E+01 |
| | 17 | 463.50 | 4.94E+01 | 35.98 | | | 4.94E+01 | 3.60E+01 |
| | 18 | 511.17 | 1.18E+02 | 51.12 | 5.21E+01 | 4.74E+00 | 6.56E+01 | 5.13E+01 |
| | 19 | 536.44 | 4.20E+01 | 46.73 | | | 4.20E+01 | 4.67E+01 |
| | 20 | 583.62 | 2.21E+02 | 51.91 | | | 2.21E+02 | 5.19E+01 |
| | 21 | 609.55 | 2.94E+02 | 57.56 | 3.25E+00 | 2.97E+00 | 2.90E+02 | 5.76E+01 |
| M | 22 | 661.77 | 2.97E+01 | 30.29 | | | 2.97E+01 | 3.03E+01 |
| m | 23 | 665.70 | 1.93E+01 | 21.90 | | | 1.93E+01 | 2.19E+01 |
| | 24 | 727.41 | 3.74E+01 | 36.25 | | | 3.74E+01 | 3.62E+01 |
| | 25 | 769.09 | 6.85E+01 | 37.78 | | | 6.85E+01 | 3.78E+01 |
| | 26 | 851.81 | 2.76E+01 | 24.25 | | | 2.76E+01 | 2.42E+01 |
| | 27 | 860.17 | 2.69E+01 | 27.96 | | | 2.69E+01 | 2.80E+01 |
| M | 28 | 903.84 | 2.37E+01 | 27.68 | | | 2.37E+01 | 2.77E+01 |
| m | 29 | 911.21 | 1.29E+02 | 31.24 | 2.85E+00 | 2.76E+00 | 1.26E+02 | 3.14E+01 |
| | 30 | 969.59 | 5.64E+01 | 31.34 | | | 5.64E+01 | 3.13E+01 |
| | 31 | 1120.95 | 7.99E+01 | 37.29 | | | 7.99E+01 | 3.73E+01 |
| | 32 | 1216.60 | 1.85E+01 | 20.78 | | | 1.85E+01 | 2.08E+01 |
| | 33 | 1238.58 | 1.83E+01 | 23.77 | | | 1.83E+01 | 2.38E+01 |
| | 34 | 1402.56 | 1.74E+01 | 16.55 | | | 1.74E+01 | 1.65E+01 |
| | 35 | 1460.88 | 6.77E+02 | 52.44 | 1.00E+00 | 1.77E+00 | 6.76E+02 | 5.25E+01 |
| | 36 | 1508.63 | 1.33E+01 | 11.14 | | | 1.33E+01 | 1.11E+01 |
| | 37 | 1644.83 | 1.01E+01 | 9.38 | | | 1.01E+01 | 9.38E+00 |
| M | 38 | 1727.06 | 6.25E+00 | 7.62 | | | 6.25E+00 | 7.62E+00 |
| m | 39 | 1730.01 | 1.15E+01 | 10.39 | | | 1.15E+01 | 1.04E+01 |
| | 40 | 1765.08 | 4.86E+01 | 18.33 | | | 4.86E+01 | 1.83E+01 |
| | 41 | 1776.27 | 5.50E+00 | 7.78 | | | 5.50E+00 | 7.78E+00 |
| | 42 | 1940.07 | 4.42E+00 | 5.50 | | | 4.42E+00 | 5.50E+00 |
| | 43 | 2204.07 | 1.54E+01 | 12.92 | | | 1.54E+01 | 1.29E+01 |
| | 44 | 2340.40 | 4.50E+00 | 5.74 | | | 4.50E+00 | 5.74E+00 |
| | 45 | 2373.57 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| | 46 | 2405.49 | 9.05E+00 | 7.75 | | | 9.05E+00 | 7.75E+00 |
| | 47 | 2413.44 | 9.50E+00 | 9.82 | | | 9.50E+00 | 9.82E+00 |
| | 48 | 2614.41 | 5.59E+01 | 15.88 | 1.86E+00 | 1.12E+00 | 5.41E+01 | 1.59E+01 |
| | 49 | 2738.02 | 7.00E+00 | 5.29 | | | 7.00E+00 | 5.29E+00 |

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

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 12:07:28PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055575.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 39.32 | 8.97E+01 | 70.45 | | | 8.97E+01 | 7.04E+01 |
| | 2 | 46.57 | 1.20E+02 | 88.36 | 4.47E+01 | 1.09E+01 | 7.55E+01 | 8.90E+01 |
| | 3 | 63.66 | 2.07E+02 | 136.91 | 4.12E+01 | 5.67E+00 | 1.66E+02 | 1.37E+02 |
| | 4 | 76.25 | 1.13E+03 | 147.68 | | | 1.13E+03 | 1.48E+02 |
| | 5 | 92.98 | 3.03E+02 | 110.15 | 7.98E+01 | 7.31E+00 | 2.23E+02 | 1.10E+02 |
| | 6 | 129.88 | 7.11E+01 | 77.16 | | | 7.11E+01 | 7.72E+01 |
| | 7 | 145.76 | 7.57E+01 | 74.87 | | | 7.57E+01 | 7.49E+01 |
| | 8 | 186.63 | 1.78E+02 | 79.92 | 3.06E+01 | 5.82E+00 | 1.48E+02 | 8.01E+01 |
| M | 9 | 238.97 | 7.86E+02 | 73.41 | 1.40E+01 | 2.71E+00 | 7.72E+02 | 7.35E+01 |
| m | 10 | 242.05 | 1.50E+02 | 73.19 | | | 1.50E+02 | 7.32E+01 |
| | 11 | 270.24 | 7.22E+01 | 56.53 | | | 7.22E+01 | 5.65E+01 |
| | 12 | 279.38 | 5.16E+01 | 52.65 | | | 5.16E+01 | 5.26E+01 |
| M | 13 | 295.63 | 2.38E+02 | 51.61 | | | 2.38E+02 | 5.16E+01 |
| m | 14 | 300.60 | 4.60E+01 | 44.27 | | | 4.60E+01 | 4.43E+01 |
| | 15 | 338.84 | 1.59E+02 | 67.33 | | | 1.59E+02 | 6.73E+01 |
| | 16 | 352.33 | 3.77E+02 | 67.43 | 6.53E+00 | 4.43E+00 | 3.71E+02 | 6.76E+01 |
| | 17 | 463.50 | 4.94E+01 | 35.98 | | | 4.94E+01 | 3.60E+01 |
| | 18 | 511.17 | 1.18E+02 | 51.12 | 5.21E+01 | 4.74E+00 | 6.56E+01 | 5.13E+01 |
| | 19 | 536.44 | 4.20E+01 | 46.73 | | | 4.20E+01 | 4.67E+01 |
| | 20 | 583.62 | 2.21E+02 | 51.91 | | | 2.21E+02 | 5.19E+01 |
| | 21 | 609.55 | 2.94E+02 | 57.56 | 3.25E+00 | 2.97E+00 | 2.90E+02 | 5.76E+01 |
| M | 22 | 661.77 | 2.97E+01 | 30.29 | | | 2.97E+01 | 3.03E+01 |
| m | 23 | 665.70 | 1.93E+01 | 21.90 | | | 1.93E+01 | 2.19E+01 |
| | 24 | 727.41 | 3.74E+01 | 36.25 | | | 3.74E+01 | 3.62E+01 |
| | 25 | 769.09 | 6.85E+01 | 37.78 | | | 6.85E+01 | 3.78E+01 |
| | 26 | 851.81 | 2.76E+01 | 24.25 | | | 2.76E+01 | 2.42E+01 |
| | 27 | 860.17 | 2.69E+01 | 27.96 | | | 2.69E+01 | 2.80E+01 |
| M | 28 | 903.84 | 2.37E+01 | 27.68 | | | 2.37E+01 | 2.77E+01 |
| m | 29 | 911.21 | 1.29E+02 | 31.24 | 2.85E+00 | 2.76E+00 | 1.26E+02 | 3.14E+01 |
| | 30 | 969.59 | 5.64E+01 | 31.34 | | | 5.64E+01 | 3.13E+01 |
| | 31 | 1120.95 | 7.99E+01 | 37.29 | | | 7.99E+01 | 3.73E+01 |
| | 32 | 1216.60 | 1.85E+01 | 20.78 | | | 1.85E+01 | 2.08E+01 |
| | 33 | 1238.58 | 1.83E+01 | 23.77 | | | 1.83E+01 | 2.38E+01 |
| | 34 | 1402.56 | 1.74E+01 | 16.55 | | | 1.74E+01 | 1.65E+01 |
| | 35 | 1460.88 | 6.77E+02 | 52.44 | 1.00E+00 | 1.77E+00 | 6.76E+02 | 5.25E+01 |
| | 36 | 1508.63 | 1.33E+01 | 11.14 | | | 1.33E+01 | 1.11E+01 |
| | 37 | 1644.83 | 1.01E+01 | 9.38 | | | 1.01E+01 | 9.38E+00 |
| M | 38 | 1727.06 | 6.25E+00 | 7.62 | | | 6.25E+00 | 7.62E+00 |
| m | 39 | 1730.01 | 1.15E+01 | 10.39 | | | 1.15E+01 | 1.04E+01 |
| | 40 | 1765.08 | 4.86E+01 | 18.33 | | | 4.86E+01 | 1.83E+01 |
| | 41 | 1776.27 | 5.50E+00 | 7.78 | | | 5.50E+00 | 7.78E+00 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 42 | 1940.07 | 4.42E+00 | 5.50 | | | 4.42E+00 | 5.50E+00 |
| 43 | 2204.07 | 1.54E+01 | 12.92 | | | 1.54E+01 | 1.29E+01 |
| 44 | 2340.40 | 4.50E+00 | 5.74 | | | 4.50E+00 | 5.74E+00 |
| 45 | 2373.57 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| 46 | 2405.49 | 9.05E+00 | 7.75 | | | 9.05E+00 | 7.75E+00 |
| 47 | 2413.44 | 9.50E+00 | 9.82 | | | 9.50E+00 | 9.82E+00 |
| 48 | 2614.41 | 5.59E+01 | 15.88 | 1.86E+00 | 1.12E+00 | 5.41E+01 | 1.59E+01 |
| 49 | 2738.02 | 7.00E+00 | 5.29 | | | 7.00E+00 | 5.29E+00 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.999 | 1460.81 | * | 10.67 | 2.13E+01 | 2.47E+00 |
| CS-137 | 0.998 | 661.65 | * | 85.12 | 5.99E-02 | 6.13E-02 |
| CE-141 | 0.939 | 145.44 | * | 48.40 | 6.29E-01 | 7.12E-01 |
| HG-203 | 0.972 | 279.19 | * | 77.30 | 2.30E-01 | 2.36E-01 |
| TL-208 | 0.979 | 583.14 | * | 30.22 | 1.11E+00 | 2.82E-01 |
| | | 860.37 | * | 4.48 | 1.29E+00 | 1.35E+00 |
| | | 2614.66 | * | 35.85 | 7.51E-01 | 2.33E-01 |
| PB-210 | 0.999 | 46.50 | * | 4.25 | 1.16E+00 | 1.37E+00 |
| BI-212 | 0.765 | 727.17 | * | 11.80 | 5.88E-01 | 5.72E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.980 | 238.63 | * | 44.60 | 1.20E+00 | 1.51E-01 |
| | | 300.09 | * | 3.41 | 1.13E+00 | 1.10E+00 |
| BI-214 | 0.972 | 609.31 | * | 46.30 | 9.92E-01 | 2.18E-01 |
| | | 1120.29 | * | 15.10 | 1.43E+00 | 6.80E-01 |
| | | 1764.49 | * | 15.80 | 1.20E+00 | 4.61E-01 |
| | | 2204.22 | * | 4.98 | 1.40E+00 | 1.18E+00 |
| PB-214 | 0.974 | 295.21 | * | 19.19 | 1.03E+00 | 2.39E-01 |
| | | 351.92 | * | 37.19 | 9.64E-01 | 1.96E-01 |
| RA-225 | 0.742 | 40.00 | * | 31.00 | 2.71E+01 | 2.16E+01 |
| RA-226 | 0.972 | 186.21 | * | 3.28 | 2.57E+00 | 4.90E+00 |
| AC-228 | 0.979 | 338.32 | * | 11.40 | 1.30E+00 | 5.63E-01 |
| | | 911.07 | * | 27.70 | 1.03E+00 | 2.69E-01 |
| | | 969.11 | * | 16.60 | 8.12E-01 | 4.56E-01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| TH-234 | 0.978 | 63.29 | * | 3.80 | 1.99E+00 | 1.65E+00 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 12:07:28PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 4 | 76.25 | 3.14610E-01 | 6.52 | | |
| | 5 | 92.98 | 6.19527E-02 | 24.75 | Sum | |
| | 6 | 129.88 | 1.97543E-02 | 54.25 | | |
| m | 10 | 242.05 | 4.16151E-02 | 24.43 | | |
| | 11 | 270.24 | 2.00648E-02 | 39.13 | | |
| | 17 | 463.50 | 1.37310E-02 | 36.39 | Tol. | SB-125 |
| | 18 | 511.17 | 1.82112E-02 | 39.15 | | |
| | 19 | 536.44 | 1.16667E-02 | 55.63 | Tol. | BA-140 |
| m | 23 | 665.70 | 5.35955E-03 | 56.76 | | |
| | 25 | 769.09 | 1.90278E-02 | 27.57 | | |
| | 26 | 851.81 | 7.66584E-03 | 43.93 | | |
| M | 28 | 903.84 | 6.59423E-03 | 58.29 | | |
| | 32 | 1216.60 | 5.14918E-03 | 56.06 | | |
| | 33 | 1238.58 | 5.08499E-03 | 64.92 | | |
| | 34 | 1402.56 | 4.83586E-03 | 47.52 | | |
| | 36 | 1508.63 | 3.69883E-03 | 41.81 | | |
| | 37 | 1644.83 | 2.79762E-03 | 46.57 | | |
| M | 38 | 1727.06 | 1.73560E-03 | 60.94 | | |
| m | 39 | 1730.01 | 3.19150E-03 | 45.23 | Sum | |
| | 41 | 1776.27 | 1.52778E-03 | 70.71 | | |
| | 42 | 1940.07 | 1.22685E-03 | 62.26 | Sum | |
| | 44 | 2340.40 | 1.25000E-03 | 63.83 | | |
| | 45 | 2373.57 | 2.77778E-03 | 31.62 | | |
| | 46 | 2405.49 | 2.51263E-03 | 42.82 | | |
| | 47 | 2413.44 | 2.63889E-03 | 51.70 | | |
| | 49 | 2738.02 | 1.94444E-03 | 37.80 | | |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.99 | 1460.81 | * | 10.67 | 2.13E+01 | 2.47E+00 |
| CS-137 | 0.99 | 661.65 | * | 85.12 | 5.99E-02 | 6.13E-02 |
| CE-141 | 0.93 | 145.44 | * | 48.40 | 6.29E-01 | 7.12E-01 |
| HG-203 | 0.97 | 279.19 | * | 77.30 | 2.30E-01 | 2.36E-01 |
| TL-208 | 0.97 | 583.14 | * | 30.22 | 1.11E+00 | 2.82E-01 |
| | | 860.37 | * | 4.48 | 1.29E+00 | 1.35E+00 |
| | | 2614.66 | * | 35.85 | 7.51E-01 | 2.33E-01 |
| PB-210 | 0.99 | 46.50 | * | 4.25 | 1.16E+00 | 1.37E+00 |
| BI-212 | 0.76 | 727.17 | * | 11.80 | 5.88E-01 | 5.72E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.98 | 238.63 | * | 44.60 | 1.20E+00 | 1.51E-01 |
| | | 300.09 | * | 3.41 | 1.13E+00 | 1.10E+00 |
| BI-214 | 0.97 | 609.31 | * | 46.30 | 9.92E-01 | 2.18E-01 |
| | | 1120.29 | * | 15.10 | 1.43E+00 | 6.80E-01 |
| | | 1764.49 | * | 15.80 | 1.20E+00 | 4.61E-01 |
| | | 2204.22 | * | 4.98 | 1.40E+00 | 1.18E+00 |
| PB-214 | 0.97 | 295.21 | * | 19.19 | 1.03E+00 | 2.39E-01 |
| | | 351.92 | * | 37.19 | 9.64E-01 | 1.96E-01 |
| RA-225 | 0.74 | 40.00 | * | 31.00 | 2.71E+01 | 2.16E+01 |
| RA-226 | 0.97 | 186.21 | * | 3.28 | 2.57E+00 | 4.90E+00 |
| AC-228 | 0.97 | 338.32 | * | 11.40 | 1.30E+00 | 5.63E-01 |
| | | 911.07 | * | 27.70 | 1.03E+00 | 2.69E-01 |
| | | 969.11 | * | 16.60 | 8.12E-01 | 4.56E-01 |
| TH-234 | 0.97 | 63.29 | * | 3.80 | 1.99E+00 | 1.65E+00 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| K-40 | 0.999 | 2.13E+01 | 2.47E+00 | |
| CS-137 | 0.998 | 5.99E-02 | 6.13E-02 | |
| CE-141 | 0.939 | 6.29E-01 | 7.12E-01 | |
| HG-203 | 0.972 | 2.30E-01 | 2.36E-01 | |
| TL-208 | 0.979 | 9.04E-01 | 1.78E-01 | |
| PB-210 | 0.999 | 1.16E+00 | 1.37E+00 | |
| BI-212 | 0.765 | 5.88E-01 | 5.72E-01 | |
| PB-212 | 0.980 | 1.20E+00 | 1.50E-01 | |
| BI-214 | 0.972 | 1.07E+00 | 1.87E-01 | |
| PB-214 | 0.974 | 9.89E-01 | 1.51E-01 | |
| RA-225 | 0.742 | 2.71E+01 | 2.16E+01 | |
| RA-226 | 0.972 | 2.57E+00 | 4.90E+00 | |
| AC-228 | 0.979 | 1.02E+00 | 2.14E-01 | |
| TH-234 | 0.978 | 1.99E+00 | 1.65E+00 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 12:07:28PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 4 | 76.25 | 3.14610E-01 | 6.52 | | |
| | 5 | 92.98 | 6.19527E-02 | 24.75 | Sum | |
| | 6 | 129.88 | 1.97543E-02 | 54.25 | | |
| m | 10 | 242.05 | 4.16151E-02 | 24.43 | | |
| | 11 | 270.24 | 2.00648E-02 | 39.13 | | |
| | 17 | 463.50 | 1.37310E-02 | 36.39 | Tol. | SB-125 |
| | 18 | 511.17 | 1.82112E-02 | 39.15 | | |
| | 19 | 536.44 | 1.16667E-02 | 55.63 | Tol. | BA-140 |
| m | 23 | 665.70 | 5.35955E-03 | 56.76 | | |
| | 25 | 769.09 | 1.90278E-02 | 27.57 | | |
| | 26 | 851.81 | 7.66584E-03 | 43.93 | | |
| M | 28 | 903.84 | 6.59423E-03 | 58.29 | | |
| | 32 | 1216.60 | 5.14918E-03 | 56.06 | | |
| | 33 | 1238.58 | 5.08499E-03 | 64.92 | | |
| | 34 | 1402.56 | 4.83586E-03 | 47.52 | | |
| | 36 | 1508.63 | 3.69883E-03 | 41.81 | | |
| | 37 | 1644.83 | 2.79762E-03 | 46.57 | | |
| M | 38 | 1727.06 | 1.73560E-03 | 60.94 | | |
| m | 39 | 1730.01 | 3.19150E-03 | 45.23 | Sum | |
| | 41 | 1776.27 | 1.52778E-03 | 70.71 | | |
| | 42 | 1940.07 | 1.22685E-03 | 62.26 | Sum | |
| | 44 | 2340.40 | 1.25000E-03 | 63.83 | | |
| | 45 | 2373.57 | 2.77778E-03 | 31.62 | | |
| | 46 | 2405.49 | 2.51263E-03 | 42.82 | | |
| | 47 | 2413.44 | 2.63889E-03 | 51.70 | | |
| | 49 | 2738.02 | 1.94444E-03 | 37.80 | | |

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

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | -1.56E+00 | 2.05E+00 | 2.05E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | 8.33E-03 | 1.09E-01 | 1.09E-01 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | -5.56E-03 | 6.91E-02 | 6.91E-02 |
| + | | K-40 | 1460.81 | * | 10.67 | 2.13E+01 | 4.45E-01 | 4.45E-01 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | 1.05E-02 | 5.68E-02 | 5.68E-02 |
| | | | 78.34 | | 96.00 | 1.53E-01 | | 7.16E-02 |
| + | | SC-46 | 889.25 | | 99.98 | -9.02E-02 | 1.76E-01 | 1.76E-01 |
| | | | 1120.51 | | 99.99 | 4.38E-01 | | 3.33E-01 |
| + | | V-48 | 983.52 | | 99.98 | -7.41E-01 | 6.11E+00 | 6.52E+00 |
| | | | 1312.10 | | 97.50 | -2.59E+00 | | 6.11E+00 |
| + | | CR-51 | 320.08 | | 9.83 | -7.97E-01 | 7.16E+00 | 7.16E+00 |
| + | | MN-54 | 834.83 | | 99.97 | 3.98E-02 | 1.05E-01 | 1.05E-01 |
| + | | CO-56 | 846.75 | | 99.96 | 3.63E-03 | 1.78E-01 | 1.78E-01 |
| | | | 1037.75 | | 14.03 | 8.65E-02 | | 1.51E+00 |
| | | | 1238.25 | | 67.00 | 9.98E-02 | | 4.58E-01 |
| | | | 1771.40 | | 15.51 | -3.62E+00 | | 1.00E+00 |
| | | | 2598.48 | | 16.90 | 1.76E-01 | | 8.45E-01 |
| + | | CO-57 | 122.06 | | 85.51 | 4.02E-03 | 6.41E-02 | 6.41E-02 |
| | | | 136.48 | | 10.60 | 1.42E-01 | | 5.35E-01 |
| + | | CO-58 | 810.76 | | 99.40 | -1.18E-01 | 2.02E-01 | 2.02E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | 1.87E-01 | 8.60E-01 | 8.60E-01 |
| | | | 1291.56 | | 43.20 | -3.52E-01 | | 1.05E+00 |
| + | | CO-60 | 1173.22 | | 100.00 | -4.32E-02 | 9.14E-02 | 1.07E-01 |
| | | | 1332.49 | | 100.00 | -3.78E-03 | | 9.14E-02 |
| + | | ZN-65 | 1115.52 | | 50.75 | -1.07E-02 | 2.55E-01 | 2.55E-01 |
| + | | GA-67 | 93.31 | | 35.70 | 4.48E+08 | 2.26E+08 | 2.26E+08 |
| | | | 208.95 | | 2.24 | 3.46E+09 | | 4.04E+09 |
| | | | 300.22 | | 16.00 | -1.19E+09 | | 6.33E+08 |
| + | | SE-75 | 121.11 | | 16.70 | 9.26E-03 | 1.31E-01 | 4.48E-01 |
| | | | 136.00 | | 59.20 | 7.66E-03 | | 1.31E-01 |
| | | | 264.65 | | 59.80 | -2.09E-02 | | 1.59E-01 |
| | | | 279.53 | | 25.20 | 3.95E-01 | | 4.20E-01 |
| | | | 400.65 | | 11.40 | 1.21E-01 | | 1.04E+00 |
| + | | RB-82 | 776.52 | | 13.00 | -3.01E+00 | 8.45E+00 | 8.45E+00 |
| + | | RB-83 | 520.41 | | 46.00 | -1.11E-01 | 3.06E-01 | 3.06E-01 |
| | | | 529.64 | | 30.30 | -8.17E-02 | | 4.74E-01 |
| | | | 552.65 | | 16.40 | -6.79E-01 | | 8.85E-01 |
| + | | KR-85 | 513.99 | | 0.43 | -1.10E+00 | 2.03E+01 | 2.03E+01 |
| + | | SR-85 | 513.99 | | 99.27 | -1.37E-02 | 2.52E-01 | 2.52E-01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | Y-88 | 898.02 | 93.40 | 1.94E-02 | 1.15E-01 | 1.53E-01 |
| | | 1836.01 | 99.38 | 1.92E-02 | | 1.15E-01 |
| + | MO-93 | 263.06 | 56.72 | 8.94E-03 | 7.52E-02 | 9.87E-02 |
| | | 684.67 | 99.68 | 2.03E-03 | | 7.52E-02 |
| | | 1477.11 | 99.08 | 2.69E-02 | | 8.02E-02 |
| + | NB-93M | 16.57 | 9.43 | -1.41E+01 | 6.15E+01 | 6.15E+01 |
| + | NB-94 | 702.63 | 100.00 | -1.22E-02 | 7.68E-02 | 7.92E-02 |
| | | 871.10 | 100.00 | -1.52E-02 | | 7.68E-02 |
| + | NB-95 | 765.79 | 99.81 | 2.44E-01 | 6.75E-01 | 6.75E-01 |
| + | NB-95M | 235.69 | 25.00 | 6.45E+07 | 6.82E+07 | 6.82E+07 |
| + | ZR-95 | 724.18 | 43.70 | -3.52E-02 | 4.48E-01 | 5.74E-01 |
| | | 756.72 | 55.30 | 5.22E-02 | | 4.48E-01 |
| + | MO-99 | 181.06 | 6.20 | 6.22E+09 | 4.26E+10 | 5.72E+10 |
| | | 739.58 | 12.80 | -1.36E+10 | | 4.26E+10 |
| | | 778.00 | 4.50 | -4.64E+10 | | 1.17E+11 |
| + | RU-103 | 497.08 | 89.00 | 5.66E-02 | 4.26E-01 | 4.26E-01 |
| + | RU-106 | 621.84 | 9.80 | -4.10E-01 | 8.25E-01 | 8.25E-01 |
| + | AG-108M | 433.93 | 89.90 | -1.03E-02 | 7.05E-02 | 7.05E-02 |
| | | 614.37 | 90.40 | 7.88E-03 | | 1.02E-01 |
| | | 722.95 | 90.50 | 2.51E-03 | | 9.05E-02 |
| + | CD-109 | 88.03 | 3.72 | 7.56E-01 | 1.68E+00 | 1.68E+00 |
| + | AG-110M | 657.75 | 93.14 | -3.99E-04 | 1.07E-01 | 1.07E-01 |
| | | 677.61 | 10.53 | -1.04E-01 | | 9.18E-01 |
| | | 706.67 | 16.46 | 5.48E-01 | | 6.63E-01 |
| | | 763.93 | 21.98 | -1.31E-02 | | 4.90E-01 |
| | | 884.67 | 71.63 | 1.84E-02 | | 1.50E-01 |
| | | 1384.27 | 23.94 | -4.77E-02 | | 3.78E-01 |
| + | CD-113M | 263.70 | 0.02 | -4.88E+01 | 2.35E+02 | 2.35E+02 |
| + | SN-113 | 255.12 | 1.93 | -1.72E+00 | 1.65E-01 | 5.19E+00 |
| | | 391.69 | 64.90 | -9.73E-02 | | 1.65E-01 |
| + | TE123M | 159.00 | 84.10 | -3.73E-02 | 9.12E-02 | 9.12E-02 |
| + | SB-124 | 602.71 | 97.87 | -7.86E-02 | 2.44E-01 | 2.44E-01 |
| | | 645.85 | 7.26 | 5.44E-01 | | 3.23E+00 |
| | | 722.78 | 11.10 | 6.39E-02 | | 2.31E+00 |
| | | 1691.02 | 49.00 | -1.77E-01 | | 4.02E-01 |
| + | I-125 | 35.49 | 6.49 | 1.54E+00 | 5.60E+00 | 5.60E+00 |
| + | SB-125 | 176.33 | 6.89 | 1.38E-01 | 2.29E-01 | 7.42E-01 |
| | | 427.89 | 29.33 | -1.13E-01 | | 2.29E-01 |
| | | 463.38 | 10.35 | 3.15E-01 | | 7.33E-01 |
| | | 600.56 | 17.80 | -4.25E-02 | | 4.49E-01 |
| | | 635.90 | 11.32 | 0.00E+00 | | 6.16E-01 |
| + | SB-126 | 414.70 | 83.30 | -1.53E+01 | 1.93E+01 | 1.93E+01 |
| | | 666.33 | 99.60 | 4.86E+00 | | 2.05E+01 |
| | | 695.00 | 99.60 | 1.85E+01 | | 2.24E+01 |
| | | 720.50 | 53.80 | 5.09E-01 | | 3.72E+01 |
| + | SN-126 | 87.57 | 37.00 | 6.55E-02 | 1.46E-01 | 1.46E-01 |
| + | SB-127 | 473.00 | 25.00 | 5.46E+06 | 1.19E+07 | 1.42E+07 |
| | | 685.20 | 35.70 | 3.21E+05 | | 1.19E+07 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | SB-127 | 783.80 | | 14.70 | -6.21E+06 | 1.19E+07 | 2.89E+07 |
| + | I-129 | 29.78 | | 57.00 | 1.72E-02 | 3.69E-01 | 3.69E-01 |
| | | 33.60 | | 13.20 | 5.52E-01 | | 1.06E+00 |
| | | 39.58 | | 7.52 | 1.07E+00 | | 1.22E+00 |
| + | I-131 | 284.30 | | 6.05 | -1.02E+03 | 4.06E+02 | 4.97E+03 |
| | | 364.48 | | 81.20 | 4.57E+01 | | 4.06E+02 |
| | | 636.97 | | 7.26 | -1.77E+02 | | 4.74E+03 |
| | | 722.89 | | 1.80 | 6.54E+02 | | 2.36E+04 |
| + | TE-132 | 49.72 | | 13.10 | -1.21E+08 | 1.04E+08 | 7.27E+08 |
| | | 228.16 | | 88.00 | 1.02E+08 | | 1.04E+08 |
| + | BA-133 | 81.00 | | 33.00 | -1.01E-01 | 1.47E-01 | 1.59E-01 |
| | | 302.84 | | 17.80 | 6.56E-02 | | 3.70E-01 |
| | | 356.01 | | 60.00 | -2.48E-03 | | 1.47E-01 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -4.28E+04 | 6.77E+04 | 6.77E+04 |
| + | CS-134 | 563.23 | | 8.38 | -3.76E-01 | 9.32E-02 | 9.17E-01 |
| | | 569.32 | | 15.43 | 3.13E-01 | | 5.51E-01 |
| | | 604.70 | | 97.60 | -1.73E-02 | | 9.32E-02 |
| | | 795.84 | | 85.40 | -1.64E-02 | | 1.01E-01 |
| | | 801.93 | | 8.73 | -5.08E-02 | | 1.08E+00 |
| + | CS-135 | 268.24 | | 16.00 | 2.27E-02 | 3.84E-01 | 3.84E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | 5.84E+01 | 1.40E+01 | 1.15E+02 |
| | | 163.89 | | 4.61 | -2.06E+01 | | 1.83E+02 |
| | | 176.55 | | 13.56 | 1.22E+01 | | 6.56E+01 |
| | | 273.65 | | 12.66 | -8.00E+01 | | 8.63E+01 |
| | | 340.57 | | 48.50 | 4.86E+01 | | 3.05E+01 |
| | | 818.50 | | 99.70 | -4.85E+00 | | 1.40E+01 |
| | | 1048.07 | | 79.60 | -8.19E+00 | | 2.05E+01 |
| | | 1235.34 | | 19.70 | 4.23E+01 | | 1.19E+02 |
| + | CS-137 | 661.65 | * | 85.12 | 5.99E-02 | 1.32E-01 | 1.32E-01 |
| + | LA-138 | 788.74 | | 34.00 | 1.16E-01 | 1.01E-01 | 2.25E-01 |
| | | 1435.80 | | 66.00 | -7.55E-03 | | 1.01E-01 |
| + | CE-139 | 165.85 | | 80.35 | 9.49E-03 | 9.69E-02 | 9.69E-02 |
| + | BA-140 | 162.64 | | 6.70 | -5.25E+01 | 6.06E+01 | 1.44E+02 |
| | | 304.84 | | 4.50 | -4.89E+01 | | 2.87E+02 |
| | | 423.70 | | 3.20 | -8.91E+01 | | 4.26E+02 |
| | | 437.55 | | 2.00 | 5.22E+01 | | 7.01E+02 |
| | | 537.32 | | 25.00 | 6.92E+00 | | 6.06E+01 |
| + | LA-140 | 328.77 | | 20.50 | 1.42E+01 | 1.97E+01 | 6.86E+01 |
| | | 487.03 | | 45.50 | -1.00E+01 | | 2.97E+01 |
| | | 815.85 | | 23.50 | 1.70E+01 | | 7.22E+01 |
| | | 1596.49 | | 95.49 | 8.64E+00 | | 1.97E+01 |
| + | CE-141 | 145.44 | * | 48.40 | 6.29E-01 | 1.02E+00 | 1.02E+00 |
| + | @ CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | CE-144 | 133.54 | 10.80 | -8.84E-02 | 5.04E-01 | 5.04E-01 |
| + | PM-144 | 476.78 | 42.00 | -1.79E-01 | 8.81E-02 | 1.67E-01 |
| | | 618.01 | 98.60 | 1.24E-02 | | 8.81E-02 |
| | | 696.49 | 99.49 | 1.68E-02 | | 1.00E-01 |
| + | PM-145 | 36.85 | 21.70 | -1.15E-03 | 2.63E-01 | 4.87E-01 |
| | | 37.36 | 39.70 | -3.09E-02 | | 2.63E-01 |
| | | 42.30 | 15.10 | -4.51E-01 | | 5.17E-01 |
| | | 72.40 | 2.31 | -5.09E+00 | | 2.72E+00 |
| + | PM-146 | 453.90 | 39.94 | -7.63E-03 | 1.75E-01 | 1.75E-01 |
| | | 735.90 | 14.01 | -5.62E-02 | | 5.53E-01 |
| | | 747.13 | 13.10 | 1.37E-01 | | 6.25E-01 |
| + | ND-147 | 91.11 | 28.90 | -3.47E+01 | 1.02E+02 | 1.02E+02 |
| | | 531.02 | 13.10 | -2.69E+01 | | 2.71E+02 |
| + | PM-149 | 285.90 | 3.10 | 6.18E+12 | 6.15E+13 | 6.15E+13 |
| + | EU-152 | 121.78 | 20.50 | 1.32E-02 | 2.10E-01 | 2.10E-01 |
| | | 244.69 | 5.40 | -2.40E+00 | | 1.25E+00 |
| | | 344.27 | 19.13 | -2.71E-02 | | 3.07E-01 |
| | | 778.89 | 9.20 | 3.59E-01 | | 8.55E-01 |
| | | 964.01 | 10.40 | 2.11E-01 | | 9.84E-01 |
| | | 1085.78 | 7.22 | 3.54E-01 | | 1.34E+00 |
| | | 1112.02 | 9.60 | -6.30E-02 | | 9.92E-01 |
| | | 1407.95 | 14.94 | -8.11E-02 | | 5.10E-01 |
| + | GD-153 | 97.43 | 31.30 | 8.10E-02 | 1.82E-01 | 1.82E-01 |
| | | 103.18 | 22.20 | -1.27E-01 | | 2.53E-01 |
| + | EU-154 | 123.07 | 40.50 | 2.24E-02 | 1.07E-01 | 1.07E-01 |
| | | 723.30 | 19.70 | 1.17E-02 | | 4.24E-01 |
| | | 873.19 | 11.50 | 8.86E-02 | | 6.83E-01 |
| | | 996.32 | 10.30 | -1.61E-01 | | 8.40E-01 |
| | | 1004.76 | 17.90 | -1.05E-01 | | 5.15E-01 |
| | | 1274.45 | 35.50 | 2.23E-02 | | 2.91E-01 |
| + | EU-155 | 86.50 | 30.90 | 1.29E-01 | 1.84E-01 | 1.84E-01 |
| | | 105.30 | 20.70 | 1.93E-02 | | 2.13E-01 |
| + | EU-156 | 811.77 | 10.40 | -8.54E+00 | 6.84E+01 | 6.84E+01 |
| | | 1153.47 | 7.20 | 2.72E+00 | | 1.22E+02 |
| | | 1230.71 | 8.90 | -2.37E+01 | | 1.21E+02 |
| + | HO-166M | 184.41 | 72.60 | 6.72E-02 | 7.90E-02 | 7.90E-02 |
| | | 280.45 | 29.60 | 9.87E-02 | | 2.00E-01 |
| | | 410.94 | 11.10 | 4.08E-02 | | 6.08E-01 |
| | | 711.69 | 54.10 | -5.95E-04 | | 1.35E-01 |
| + | TM-171 | 66.72 | 0.14 | -4.77E+01 | 4.39E+01 | 4.39E+01 |
| + | HF-172 | 67.35 | 5.31 | 2.06E-01 | 4.13E-01 | 1.12E+00 |
| | | 125.81 | 11.30 | 1.75E-02 | | 4.13E-01 |
| + | LU-172 | 181.53 | 20.60 | -2.97E+01 | 4.58E+03 | 6.76E+03 |
| | | 900.72 | 29.81 | -2.47E+03 | | 7.77E+03 |
| | | 1093.66 | 62.50 | -1.00E+02 | | 4.58E+03 |
| + | LU-173 | 100.72 | 5.24 | 4.19E-01 | 3.42E-01 | 9.54E-01 |
| | | 272.11 | 21.20 | 4.52E-01 | | 3.42E-01 |
| + | HF-175 | 343.40 | 84.00 | -1.62E-02 | 1.84E-01 | 1.84E-01 |
| + | LU-176 | 88.34 | 13.30 | 2.23E-01 | 5.90E-02 | 4.15E-01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | LU-176 | 201.83 | | 86.00 | -2.04E-03 | 5.90E-02 | 5.90E-02 |
| | | 306.78 | | 94.00 | 3.39E-02 | | 6.53E-02 |
| + | HF-181 | 133.02 | | 41.70 | 6.12E-02 | 4.11E-01 | 5.36E-01 |
| | | 345.85 | | 17.20 | -1.51E-01 | | 1.75E+00 |
| | | 482.03 | | 82.80 | 2.79E-01 | | 4.11E-01 |
| + | TA-182 | 67.75 | | 41.20 | 4.37E-02 | 2.37E-01 | 2.37E-01 |
| | | 1121.30 | | 34.90 | 1.13E+00 | | 7.72E-01 |
| | | 1189.05 | | 16.23 | -6.99E-01 | | 1.27E+00 |
| | | 1221.41 | | 26.98 | -1.12E-01 | | 6.74E-01 |
| | | 1231.02 | | 11.44 | -3.63E-01 | | 1.85E+00 |
| + | IR-192 | 308.46 | | 29.68 | 2.70E-02 | 3.06E-01 | 5.06E-01 |
| | | 468.07 | | 48.10 | -1.84E-01 | | 3.06E-01 |
| + | HG-203 | 279.19 | * | 77.30 | 2.30E-01 | 3.84E-01 | 3.84E-01 |
| + | TL-204 | 374.74 | | 94.11 | -1.54E-02 | 6.72E-02 | 6.72E-02 |
| | | 899.15 | | 99.16 | 4.22E-03 | | 7.79E-02 |
| | | 911.74 | | 91.10 | 3.54E-01 | | 1.64E-01 |
| + | BI-207 | 569.67 | | 97.72 | 4.25E-02 | 7.83E-02 | 7.83E-02 |
| | | 1063.62 | | 74.90 | -2.97E-02 | | 1.17E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 1.11E+00 | 1.77E-01 | 3.66E-01 |
| | | 860.37 | * | 4.48 | 1.29E+00 | | 2.18E+00 |
| | | 2614.66 | * | 35.85 | 7.51E-01 | | 1.77E-01 |
| + | BI-210M | 262.00 | | 45.00 | 2.58E-02 | 1.23E-01 | 1.23E-01 |
| | | 300.00 | | 23.00 | -5.70E-01 | | 3.03E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 1.16E+00 | 2.24E+00 | 2.24E+00 |
| + | PB-211 | 404.84 | | 2.90 | 5.74E-02 | 2.32E+00 | 2.32E+00 |
| | | 831.96 | | 2.90 | -7.65E-01 | | 2.57E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 5.88E-01 | 9.25E-01 | 9.25E-01 |
| | | 1620.62 | | 2.75 | 3.98E-01 | | 2.75E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.20E+00 | 2.27E-01 | 2.27E-01 |
| | | 300.09 | * | 3.41 | 1.13E+00 | | 2.71E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 9.92E-01 | 2.71E-01 | 2.71E-01 |
| | | 1120.29 | * | 15.10 | 1.43E+00 | | 1.01E+00 |
| | | 1764.49 | * | 15.80 | 1.20E+00 | | 5.48E-01 |
| | | 2204.22 | * | 4.98 | 1.40E+00 | | 1.78E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 1.03E+00 | 2.44E-01 | 4.71E-01 |
| | | 351.92 | * | 37.19 | 9.64E-01 | | 2.44E-01 |
| + | RN-219 | 401.80 | | 6.50 | 8.52E-02 | 1.02E+00 | 1.02E+00 |
| + | RA-223 | 323.87 | | 3.88 | -8.27E-01 | 1.60E+00 | 1.60E+00 |
| + | RA-224 | 240.98 | | 3.95 | 1.58E+01 | 2.88E+00 | 2.88E+00 |
| + | RA-225 | 40.00 | * | 31.00 | 2.71E+01 | 3.45E+01 | 3.45E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.57E+00 | 2.23E+00 | 2.23E+00 |
| + | TH-227 | 50.10 | | 8.40 | -1.26E-01 | 7.61E-01 | 7.61E-01 |
| | | 236.00 | | 11.50 | 7.44E-01 | | 7.87E-01 |
| | | 256.20 | | 6.30 | -1.97E-01 | | 8.82E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.30E+00 | 5.63E-01 | 8.63E-01 |
| | | 911.07 | * | 27.70 | 1.03E+00 | | 5.63E-01 |
| | | 969.11 | * | 16.60 | 8.12E-01 | | 6.90E-01 |
| + | TH-230 | 48.44 | | 16.90 | 2.76E-01 | 4.18E-01 | 4.18E-01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | TH-230 | 62.85 | | 4.60 | 1.98E+00 | 4.18E-01 | 1.37E+00 |
| | | 67.67 | | 0.37 | 2.67E+00 | | 1.45E+01 |
| + | PA-231 | 283.67 | | 1.60 | -4.15E-01 | 2.81E+00 | 3.61E+00 |
| | | 302.67 | | 2.30 | 4.98E-01 | | 2.81E+00 |
| + | TH-231 | 25.64 | | 14.70 | -1.61E+00 | 8.02E-01 | 2.57E+00 |
| | | 84.21 | | 6.40 | -4.80E-01 | | 8.02E-01 |
| + | PA-233 | 311.98 | | 38.60 | -1.53E-01 | 1.91E+00 | 1.91E+00 |
| + | PA-234 | 131.20 | | 20.40 | 1.10E-01 | 2.24E-01 | 2.24E-01 |
| | | 733.99 | | 8.80 | 6.05E-02 | | 8.48E-01 |
| | | 946.00 | | 12.00 | -1.10E-01 | | 7.07E-01 |
| + | PA-234M | 1001.03 | | 0.92 | -6.82E-01 | 9.94E+00 | 9.94E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 1.99E+00 | 2.68E+00 | 2.68E+00 |
| + | U-235 | 143.76 | | 10.50 | 8.78E-02 | 4.44E-01 | 4.44E-01 |
| | | 163.35 | | 4.70 | -1.08E-01 | | 9.60E-01 |
| | | 205.31 | | 4.70 | -4.13E-01 | | 1.28E+00 |
| + | NP-237 | 86.50 | | 12.60 | 3.05E-01 | 4.35E-01 | 4.35E-01 |
| + | NP-239 | 106.10 | | 22.70 | 8.24E+10 | 9.11E+11 | 9.11E+11 |
| | | 228.18 | | 10.70 | 2.75E+12 | | 2.82E+12 |
| | | 277.60 | | 14.10 | 7.81E+11 | | 2.01E+12 |
| + | AM-241 | 59.54 | | 35.90 | -1.48E-01 | 1.63E-01 | 1.63E-01 |
| + | AM-243 | 74.67 | | 66.00 | 1.10E-01 | 1.10E-01 | 1.10E-01 |
| + | CM-243 | 209.75 | | 3.29 | 7.23E-01 | 4.20E-01 | 1.86E+00 |
| | | 228.14 | | 10.60 | 5.76E-01 | | 5.91E-01 |
| | | 277.60 | | 14.00 | 1.63E-01 | | 4.20E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 2.05E+00 | 2.05E+00 | -1.56E+00 | 9.64E-01 |
| | NA-22 | 1274.54 | | 99.94 | 1.09E-01 | 1.09E-01 | 8.33E-03 | 5.00E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 6.91E-02 | 6.91E-02 | -5.56E-03 | 2.92E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 4.45E-01 | 4.45E-01 | 2.13E+01 | 1.80E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 5.68E-02 | 5.68E-02 | 1.05E-02 | 2.78E-02 |
| | | 78.34 | | 96.00 | 7.16E-02 | | 1.53E-01 | 3.52E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.76E-01 | 1.76E-01 | -9.02E-02 | 8.12E-02 |
| | | 1120.51 | | 99.99 | 3.33E-01 | | 4.38E-01 | 1.58E-01 |
| | V-48 | 983.52 | | 99.98 | 6.52E+00 | 6.11E+00 | -7.41E-01 | 3.01E+00 |
| | | 1312.10 | | 97.50 | 6.11E+00 | | -2.59E+00 | 2.74E+00 |
| | CR-51 | 320.08 | | 9.83 | 7.16E+00 | 7.16E+00 | -7.97E-01 | 3.43E+00 |
| | MN-54 | 834.83 | | 99.97 | 1.05E-01 | 1.05E-01 | 3.98E-02 | 4.90E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.78E-01 | 1.78E-01 | 3.63E-03 | 8.20E-02 |
| | | 1037.75 | | 14.03 | 1.51E+00 | | 8.65E-02 | 6.97E-01 |
| | | 1238.25 | | 67.00 | 4.58E-01 | | 9.98E-02 | 2.15E-01 |
| | | 1771.40 | | 15.51 | 1.00E+00 | | -3.62E+00 | 4.20E-01 |
| | | 2598.48 | | 16.90 | 8.45E-01 | | 1.76E-01 | 3.27E-01 |
| | CO-57 | 122.06 | | 85.51 | 6.41E-02 | 6.41E-02 | 4.02E-03 | 3.12E-02 |
| | | 136.48 | | 10.60 | 5.35E-01 | | 1.42E-01 | 2.60E-01 |
| | CO-58 | 810.76 | | 99.40 | 2.02E-01 | 2.02E-01 | -1.18E-01 | 9.37E-02 |
| | FE-59 | 1099.22 | | 56.50 | 8.60E-01 | 8.60E-01 | 1.87E-01 | 4.00E-01 |
| | | 1291.56 | | 43.20 | 1.05E+00 | | -3.52E-01 | 4.79E-01 |
| | CO-60 | 1173.22 | | 100.00 | 1.07E-01 | 9.14E-02 | -4.32E-02 | 4.94E-02 |
| | | 1332.49 | | 100.00 | 9.14E-02 | | -3.78E-03 | 4.13E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 2.55E-01 | 2.55E-01 | -1.07E-02 | 1.18E-01 |
| | GA-67 | 93.31 | | 35.70 | 2.26E+08 | 2.26E+08 | 4.48E+08 | 1.11E+08 |
| | | 208.95 | | 2.24 | 4.04E+09 | | 3.46E+09 | 1.97E+09 |
| | | 300.22 | | 16.00 | 6.33E+08 | | -1.19E+09 | 3.06E+08 |
| | SE-75 | 121.11 | | 16.70 | 4.48E-01 | 1.31E-01 | 9.26E-03 | 2.17E-01 |
| | | 136.00 | | 59.20 | 1.31E-01 | | 7.66E-03 | 6.37E-02 |
| | | 264.65 | | 59.80 | 1.59E-01 | | -2.09E-02 | 7.65E-02 |
| | | 279.53 | | 25.20 | 4.20E-01 | | 3.95E-01 | 2.03E-01 |
| | | 400.65 | | 11.40 | 1.04E+00 | | 1.21E-01 | 4.97E-01 |
| | RB-82 | 776.52 | | 13.00 | 8.45E+00 | 8.45E+00 | -3.01E+00 | 3.92E+00 |
| | RB-83 | 520.41 | | 46.00 | 3.06E-01 | 3.06E-01 | -1.11E-01 | 1.44E-01 |
| | | 529.64 | | 30.30 | 4.74E-01 | | -8.17E-02 | 2.23E-01 |
| | | 552.65 | | 16.40 | 8.85E-01 | | -6.79E-01 | 4.16E-01 |
| | KR-85 | 513.99 | | 0.43 | 2.03E+01 | 2.03E+01 | -1.10E+00 | 9.74E+00 |
| | SR-85 | 513.99 | | 99.27 | 2.52E-01 | 2.52E-01 | -1.37E-02 | 1.21E-01 |
| | Y-88 | 898.02 | | 93.40 | 1.53E-01 | 1.15E-01 | 1.94E-02 | 7.04E-02 |
| | | 1836.01 | | 99.38 | 1.15E-01 | | 1.92E-02 | 4.73E-02 |
| | MO-93 | 263.06 | | 56.72 | 9.87E-02 | 7.52E-02 | 8.94E-03 | 4.75E-02 |
| | | 684.67 | | 99.68 | 7.52E-02 | | 2.03E-03 | 3.52E-02 |
| | | 1477.11 | | 99.08 | 8.02E-02 | | 2.69E-02 | 3.54E-02 |
| | NB-93M | 16.57 | | 9.43 | 6.15E+01 | 6.15E+01 | -1.41E+01 | 2.99E+01 |
| | NB-94 | 702.63 | | 100.00 | 7.92E-02 | 7.68E-02 | -1.22E-02 | 3.72E-02 |
| | | 871.10 | | 100.00 | 7.68E-02 | | -1.52E-02 | 3.54E-02 |
| | NB-95 | 765.79 | | 99.81 | 6.75E-01 | 6.75E-01 | 2.44E-01 | 3.19E-01 |
| | NB-95M | 235.69 | | 25.00 | 6.82E+07 | 6.82E+07 | 6.45E+07 | 3.34E+07 |
| | ZR-95 | 724.18 | | 43.70 | 5.74E-01 | 4.48E-01 | -3.52E-02 | 2.70E-01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| ZR-95 | 756.72 | 55.30 | 4.48E-01 | 4.48E-01 | 5.22E-02 | 2.10E-01 |
| MO-99 | 181.06 | 6.20 | 5.72E+10 | 4.26E+10 | 6.22E+09 | 2.77E+10 |
| | 739.58 | 12.80 | 4.26E+10 | | -1.36E+10 | 1.99E+10 |
| | 778.00 | 4.50 | 1.17E+11 | | -4.64E+10 | 5.43E+10 |
| RU-103 | 497.08 | 89.00 | 4.26E-01 | 4.26E-01 | 5.66E-02 | 2.02E-01 |
| RU-106 | 621.84 | 9.80 | 8.25E-01 | 8.25E-01 | -4.10E-01 | 3.86E-01 |
| AG-108M | 433.93 | 89.90 | 7.05E-02 | 7.05E-02 | -1.03E-02 | 3.35E-02 |
| | 614.37 | 90.40 | 1.02E-01 | | 7.88E-03 | 4.88E-02 |
| | 722.95 | 90.50 | 9.05E-02 | | 2.51E-03 | 4.25E-02 |
| CD-109 | 88.03 | 3.72 | 1.68E+00 | 1.68E+00 | 7.56E-01 | 8.22E-01 |
| AG-110M | 657.75 | 93.14 | 1.07E-01 | 1.07E-01 | -3.99E-04 | 5.05E-02 |
| | 677.61 | 10.53 | 9.18E-01 | | -1.04E-01 | 4.30E-01 |
| | 706.67 | 16.46 | 6.63E-01 | | 5.48E-01 | 3.12E-01 |
| | 763.93 | 21.98 | 4.90E-01 | | -1.31E-02 | 2.29E-01 |
| | 884.67 | 71.63 | 1.50E-01 | | 1.84E-02 | 6.93E-02 |
| | 1384.27 | 23.94 | 3.78E-01 | | -4.77E-02 | 1.65E-01 |
| CD-113M | 263.70 | 0.02 | 2.35E+02 | 2.35E+02 | -4.88E+01 | 1.13E+02 |
| SN-113 | 255.12 | 1.93 | 5.19E+00 | 1.65E-01 | -1.72E+00 | 2.50E+00 |
| | 391.69 | 64.90 | 1.65E-01 | | -9.73E-02 | 7.83E-02 |
| TE123M | 159.00 | 84.10 | 9.12E-02 | 9.12E-02 | -3.73E-02 | 4.42E-02 |
| SB-124 | 602.71 | 97.87 | 2.44E-01 | 2.44E-01 | -7.86E-02 | 1.15E-01 |
| | 645.85 | 7.26 | 3.23E+00 | | 5.44E-01 | 1.52E+00 |
| | 722.78 | 11.10 | 2.31E+00 | | 6.39E-02 | 1.08E+00 |
| | 1691.02 | 49.00 | 4.02E-01 | | -1.77E-01 | 1.68E-01 |
| I-125 | 35.49 | 6.49 | 5.60E+00 | 5.60E+00 | 1.54E+00 | 2.72E+00 |
| SB-125 | 176.33 | 6.89 | 7.42E-01 | 2.29E-01 | 1.38E-01 | 3.59E-01 |
| | 427.89 | 29.33 | 2.29E-01 | | -1.13E-01 | 1.09E-01 |
| | 463.38 | 10.35 | 7.33E-01 | | 3.15E-01 | 3.49E-01 |
| | 600.56 | 17.80 | 4.49E-01 | | -4.25E-02 | 2.12E-01 |
| | 635.90 | 11.32 | 6.16E-01 | | 0.00E+00 | 2.87E-01 |
| SB-126 | 414.70 | 83.30 | 1.93E+01 | 1.93E+01 | -1.53E+01 | 9.17E+00 |
| | 666.33 | 99.60 | 2.05E+01 | | 4.86E+00 | 9.64E+00 |
| | 695.00 | 99.60 | 2.24E+01 | | 1.85E+01 | 1.06E+01 |
| | 720.50 | 53.80 | 3.72E+01 | | 5.09E-01 | 1.74E+01 |
| SN-126 | 87.57 | 37.00 | 1.46E-01 | 1.46E-01 | 6.55E-02 | 7.13E-02 |
| SB-127 | 473.00 | 25.00 | 1.42E+07 | 1.19E+07 | 5.46E+06 | 6.71E+06 |
| | 685.20 | 35.70 | 1.19E+07 | | 3.21E+05 | 5.55E+06 |
| | 783.80 | 14.70 | 2.89E+07 | | -6.21E+06 | 1.34E+07 |
| I-129 | 29.78 | 57.00 | 3.69E-01 | 3.69E-01 | 1.72E-02 | 1.80E-01 |
| | 33.60 | 13.20 | 1.06E+00 | | 5.52E-01 | 5.14E-01 |
| | 39.58 | 7.52 | 1.22E+00 | | 1.07E+00 | 5.94E-01 |
| I-131 | 284.30 | 6.05 | 4.97E+03 | 4.06E+02 | -1.02E+03 | 2.39E+03 |
| | 364.48 | 81.20 | 4.06E+02 | | 4.57E+01 | 1.95E+02 |
| | 636.97 | 7.26 | 4.74E+03 | | -1.77E+02 | 2.21E+03 |
| | 722.89 | 1.80 | 2.36E+04 | | 6.54E+02 | 1.11E+04 |
| TE-132 | 49.72 | 13.10 | 7.27E+08 | 1.04E+08 | -1.21E+08 | 3.55E+08 |
| | 228.16 | 88.00 | 1.04E+08 | | 1.02E+08 | 5.07E+07 |
| BA-133 | 81.00 | 33.00 | 1.59E-01 | 1.47E-01 | -1.01E-01 | 7.77E-02 |
| | 302.84 | 17.80 | 3.70E-01 | | 6.56E-02 | 1.79E-01 |
| | 356.01 | 60.00 | 1.47E-01 | | -2.48E-03 | 7.14E-02 |
| @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| XE-133 | 81.00 | 38.00 | 6.77E+04 | 6.77E+04 | -4.28E+04 | 3.31E+04 |
| CS-134 | 563.23 | 8.38 | 9.17E-01 | 9.32E-02 | -3.76E-01 | 4.32E-01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | CS-134 | 569.32 | | 15.43 | 5.51E-01 | 9.32E-02 | 3.13E-01 | 2.61E-01 |
| | | 604.70 | | 97.60 | 9.32E-02 | | -1.73E-02 | 4.42E-02 |
| | | 795.84 | | 85.40 | 1.01E-01 | | -1.64E-02 | 4.72E-02 |
| | | 801.93 | | 8.73 | 1.08E+00 | | -5.08E-02 | 5.05E-01 |
| | CS-135 | 268.24 | | 16.00 | 3.84E-01 | 3.84E-01 | 2.27E-02 | 1.86E-01 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CS-136 | 153.22 | | 7.46 | 1.15E+02 | 1.40E+01 | 5.84E+01 | 5.59E+01 |
| | | 163.89 | | 4.61 | 1.83E+02 | | -2.06E+01 | 8.85E+01 |
| | | 176.55 | | 13.56 | 6.56E+01 | | 1.22E+01 | 3.18E+01 |
| | | 273.65 | | 12.66 | 8.63E+01 | | -8.00E+01 | 4.16E+01 |
| | | 340.57 | | 48.50 | 3.05E+01 | | 4.86E+01 | 1.48E+01 |
| | | 818.50 | | 99.70 | 1.40E+01 | | -4.85E+00 | 6.46E+00 |
| | | 1048.07 | | 79.60 | 2.05E+01 | | -8.19E+00 | 9.44E+00 |
| | | 1235.34 | | 19.70 | 1.19E+02 | | 4.23E+01 | 5.56E+01 |
| + | CS-137 | 661.65 | * | 85.12 | 1.32E-01 | 1.32E-01 | 5.99E-02 | 6.32E-02 |
| | LA-138 | 788.74 | | 34.00 | 2.25E-01 | 1.01E-01 | 1.16E-01 | 1.05E-01 |
| | | 1435.80 | | 66.00 | 1.01E-01 | | -7.55E-03 | 4.38E-02 |
| | CE-139 | 165.85 | | 80.35 | 9.69E-02 | 9.69E-02 | 9.49E-03 | 4.70E-02 |
| | BA-140 | 162.64 | | 6.70 | 1.44E+02 | 6.06E+01 | -5.25E+01 | 6.95E+01 |
| | | 304.84 | | 4.50 | 2.87E+02 | | -4.89E+01 | 1.38E+02 |
| | | 423.70 | | 3.20 | 4.26E+02 | | -8.91E+01 | 2.02E+02 |
| | | 437.55 | | 2.00 | 7.01E+02 | | 5.22E+01 | 3.33E+02 |
| | | 537.32 | | 25.00 | 6.06E+01 | | 6.92E+00 | 2.86E+01 |
| | LA-140 | 328.77 | | 20.50 | 6.86E+01 | 1.97E+01 | 1.42E+01 | 3.30E+01 |
| | | 487.03 | | 45.50 | 2.97E+01 | | -1.00E+01 | 1.40E+01 |
| | | 815.85 | | 23.50 | 7.22E+01 | | 1.70E+01 | 3.36E+01 |
| | | 1596.49 | | 95.49 | 1.97E+01 | | 8.64E+00 | 8.73E+00 |
| + | CE-141 | 145.44 | * | 48.40 | 1.02E+00 | 1.02E+00 | 6.29E-01 | 4.97E-01 |
| @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-144 | 133.54 | | 10.80 | 5.04E-01 | 5.04E-01 | -8.84E-02 | 2.45E-01 |
| | PM-144 | 476.78 | | 42.00 | 1.67E-01 | 8.81E-02 | -1.79E-01 | 7.87E-02 |
| | | 618.01 | | 98.60 | 8.81E-02 | | 1.24E-02 | 4.14E-02 |
| | | 696.49 | | 99.49 | 1.00E-01 | | 1.68E-02 | 4.73E-02 |
| | PM-145 | 36.85 | | 21.70 | 4.87E-01 | 2.63E-01 | -1.15E-03 | 2.37E-01 |
| | | 37.36 | | 39.70 | 2.63E-01 | | -3.09E-02 | 1.28E-01 |
| | | 42.30 | | 15.10 | 5.17E-01 | | -4.51E-01 | 2.52E-01 |
| | | 72.40 | | 2.31 | 2.72E+00 | | -5.09E+00 | 1.34E+00 |
| | PM-146 | 453.90 | | 39.94 | 1.75E-01 | 1.75E-01 | -7.63E-03 | 8.33E-02 |
| | | 735.90 | | 14.01 | 5.53E-01 | | -5.62E-02 | 2.58E-01 |
| | | 747.13 | | 13.10 | 6.25E-01 | | 1.37E-01 | 2.92E-01 |
| | ND-147 | 91.11 | | 28.90 | 1.02E+02 | 1.02E+02 | -3.47E+01 | 5.00E+01 |
| | | 531.02 | | 13.10 | 2.71E+02 | | -2.69E+01 | 1.28E+02 |
| | PM-149 | 285.90 | | 3.10 | 6.15E+13 | 6.15E+13 | 6.18E+12 | 2.96E+13 |
| | EU-152 | 121.78 | | 20.50 | 2.10E-01 | 2.10E-01 | 1.32E-02 | 1.02E-01 |
| | | 244.69 | | 5.40 | 1.25E+00 | | -2.40E+00 | 6.08E-01 |
| | | 344.27 | | 19.13 | 3.07E-01 | | -2.71E-02 | 1.47E-01 |
| | | 778.89 | | 9.20 | 8.55E-01 | | 3.59E-01 | 3.98E-01 |
| | | 964.01 | | 10.40 | 9.84E-01 | | 2.11E-01 | 4.61E-01 |
| | | 1085.78 | | 7.22 | 1.34E+00 | | 3.54E-01 | 6.21E-01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | EU-152 | 1112.02 | | 9.60 | 9.92E-01 | 2.10E-01 | -6.30E-02 | 4.58E-01 |
| | | 1407.95 | | 14.94 | 5.10E-01 | | -8.11E-02 | 2.25E-01 |
| | GD-153 | 97.43 | | 31.30 | 1.82E-01 | 1.82E-01 | 8.10E-02 | 8.87E-02 |
| | | 103.18 | | 22.20 | 2.53E-01 | | -1.27E-01 | 1.23E-01 |
| | EU-154 | 123.07 | | 40.50 | 1.07E-01 | 1.07E-01 | 2.24E-02 | 5.22E-02 |
| | | 723.30 | | 19.70 | 4.24E-01 | | 1.17E-02 | 1.99E-01 |
| | | 873.19 | | 11.50 | 6.83E-01 | | 8.86E-02 | 3.16E-01 |
| | | 996.32 | | 10.30 | 8.40E-01 | | -1.61E-01 | 3.87E-01 |
| | | 1004.76 | | 17.90 | 5.15E-01 | | -1.05E-01 | 2.38E-01 |
| | | 1274.45 | | 35.50 | 2.91E-01 | | 2.23E-02 | 1.34E-01 |
| | EU-155 | 86.50 | | 30.90 | 1.84E-01 | 1.84E-01 | 1.29E-01 | 9.02E-02 |
| | | 105.30 | | 20.70 | 2.13E-01 | | 1.93E-02 | 1.04E-01 |
| | EU-156 | 811.77 | | 10.40 | 6.84E+01 | 6.84E+01 | -8.54E+00 | 3.17E+01 |
| | | 1153.47 | | 7.20 | 1.22E+02 | | 2.72E+00 | 5.63E+01 |
| | | 1230.71 | | 8.90 | 1.21E+02 | | -2.37E+01 | 5.63E+01 |
| | HO-166M | 184.41 | | 72.60 | 7.90E-02 | 7.90E-02 | 6.72E-02 | 3.85E-02 |
| | | 280.45 | | 29.60 | 2.00E-01 | | 9.87E-02 | 9.66E-02 |
| | | 410.94 | | 11.10 | 6.08E-01 | | 4.08E-02 | 2.90E-01 |
| | | 711.69 | | 54.10 | 1.35E-01 | | -5.95E-04 | 6.31E-02 |
| | TM-171 | 66.72 | | 0.14 | 4.39E+01 | 4.39E+01 | -4.77E+01 | 2.15E+01 |
| | HF-172 | 67.35 | | 5.31 | 1.12E+00 | 4.13E-01 | 2.06E-01 | 5.47E-01 |
| | | 125.81 | | 11.30 | 4.13E-01 | | 1.75E-02 | 2.00E-01 |
| | LU-172 | 181.53 | | 20.60 | 6.76E+03 | 4.58E+03 | -2.97E+01 | 3.27E+03 |
| | | 900.72 | | 29.81 | 7.77E+03 | | -2.47E+03 | 3.59E+03 |
| | | 1093.66 | | 62.50 | 4.58E+03 | | -1.00E+02 | 2.12E+03 |
| | LU-173 | 100.72 | | 5.24 | 9.54E-01 | 3.42E-01 | 4.19E-01 | 4.65E-01 |
| | | 272.11 | | 21.20 | 3.42E-01 | | 4.52E-01 | 1.65E-01 |
| | HF-175 | 343.40 | | 84.00 | 1.84E-01 | 1.84E-01 | -1.62E-02 | 8.79E-02 |
| | LU-176 | 88.34 | | 13.30 | 4.15E-01 | 5.90E-02 | 2.23E-01 | 2.03E-01 |
| | | 201.83 | | 86.00 | 5.90E-02 | | -2.04E-03 | 2.86E-02 |
| | | 306.78 | | 94.00 | 6.53E-02 | | 3.39E-02 | 3.14E-02 |
| | HF-181 | 133.02 | | 41.70 | 5.36E-01 | 4.11E-01 | 6.12E-02 | 2.60E-01 |
| | | 345.85 | | 17.20 | 1.75E+00 | | -1.51E-01 | 8.39E-01 |
| | | 482.03 | | 82.80 | 4.11E-01 | | 2.79E-01 | 1.95E-01 |
| | TA-182 | 67.75 | | 41.20 | 2.37E-01 | 2.37E-01 | 4.37E-02 | 1.16E-01 |
| | | 1121.30 | | 34.90 | 7.72E-01 | | 1.13E+00 | 3.67E-01 |
| | | 1189.05 | | 16.23 | 1.27E+00 | | -6.99E-01 | 5.91E-01 |
| | | 1221.41 | | 26.98 | 6.74E-01 | | -1.12E-01 | 3.10E-01 |
| | | 1231.02 | | 11.44 | 1.85E+00 | | -3.63E-01 | 8.63E-01 |
| | IR-192 | 308.46 | | 29.68 | 5.06E-01 | 3.06E-01 | 2.70E-02 | 2.43E-01 |
| | | 468.07 | | 48.10 | 3.06E-01 | | -1.84E-01 | 1.44E-01 |
| + | HG-203 | 279.19 | * | 77.30 | 3.84E-01 | 3.84E-01 | 2.30E-01 | 1.86E-01 |
| | TL-204 | 374.74 | | 94.11 | 6.72E-02 | 6.72E-02 | -1.54E-02 | 3.21E-02 |
| | | 899.15 | | 99.16 | 7.79E-02 | | 4.22E-03 | 3.58E-02 |
| | | 911.74 | | 91.10 | 1.64E-01 | | 3.54E-01 | 7.83E-02 |
| | BI-207 | 569.67 | | 97.72 | 7.83E-02 | 7.83E-02 | 4.25E-02 | 3.71E-02 |
| | | 1063.62 | | 74.90 | 1.17E-01 | | -2.97E-02 | 5.36E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 3.66E-01 | 1.77E-01 | 1.11E+00 | 1.76E-01 |
| | | 860.37 | * | 4.48 | 2.18E+00 | | 1.29E+00 | 1.03E+00 |
| | | 2614.66 | * | 35.85 | 1.77E-01 | | 7.51E-01 | 6.96E-02 |
| | BI-210M | 262.00 | | 45.00 | 1.23E-01 | 1.23E-01 | 2.58E-02 | 5.92E-02 |
| | | 300.00 | | 23.00 | 3.03E-01 | | -5.70E-01 | 1.47E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 2.24E+00 | 2.24E+00 | 1.16E+00 | 1.10E+00 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | PB-211 | 404.84 | | 2.90 | 2.32E+00 | 2.32E+00 | 5.74E-02 | 1.11E+00 |
| | | 831.96 | | 2.90 | 2.57E+00 | | -7.65E-01 | 1.19E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 9.25E-01 | 9.25E-01 | 5.88E-01 | 4.41E-01 |
| | | 1620.62 | | 2.75 | 2.75E+00 | | 3.98E-01 | 1.20E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 2.27E-01 | 2.27E-01 | 1.20E+00 | 1.11E-01 |
| | | 300.09 | * | 3.41 | 2.71E+00 | | 1.13E+00 | 1.32E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 2.71E-01 | 2.71E-01 | 9.92E-01 | 1.31E-01 |
| | | 1120.29 | * | 15.10 | 1.01E+00 | | 1.43E+00 | 4.83E-01 |
| | | 1764.49 | * | 15.80 | 5.48E-01 | | 1.20E+00 | 2.41E-01 |
| | | 2204.22 | * | 4.98 | 1.78E+00 | | 1.40E+00 | 7.67E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 4.71E-01 | 2.44E-01 | 1.03E+00 | 2.30E-01 |
| | | 351.92 | * | 37.19 | 2.44E-01 | | 9.64E-01 | 1.19E-01 |
| | RN-219 | 401.80 | | 6.50 | 1.02E+00 | 1.02E+00 | 8.52E-02 | 4.86E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.60E+00 | 1.60E+00 | -8.27E-01 | 7.66E-01 |
| | RA-224 | 240.98 | | 3.95 | 2.88E+00 | 2.88E+00 | 1.58E+01 | 1.42E+00 |
| + | RA-225 | 40.00 | * | 31.00 | 3.45E+01 | 3.45E+01 | 2.71E+01 | 1.68E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.23E+00 | 2.23E+00 | 2.57E+00 | 1.09E+00 |
| | TH-227 | 50.10 | | 8.40 | 7.61E-01 | 7.61E-01 | -1.26E-01 | 3.71E-01 |
| | | 236.00 | | 11.50 | 7.87E-01 | | 7.44E-01 | 3.85E-01 |
| | | 256.20 | | 6.30 | 8.82E-01 | | -1.97E-01 | 4.25E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 8.63E-01 | 5.63E-01 | 1.30E+00 | 4.20E-01 |
| | | 911.07 | * | 27.70 | 5.63E-01 | | 1.03E+00 | 2.70E-01 |
| | | 969.11 | * | 16.60 | 6.90E-01 | | 8.12E-01 | 3.26E-01 |
| | TH-230 | 48.44 | | 16.90 | 4.18E-01 | 4.18E-01 | 2.76E-01 | 2.04E-01 |
| | | 62.85 | | 4.60 | 1.37E+00 | | 1.98E+00 | 6.73E-01 |
| | | 67.67 | | 0.37 | 1.45E+01 | | 2.67E+00 | 7.08E+00 |
| | PA-231 | 283.67 | | 1.60 | 3.61E+00 | 2.81E+00 | -4.15E-01 | 1.74E+00 |
| | | 302.67 | | 2.30 | 2.81E+00 | | 4.98E-01 | 1.36E+00 |
| | TH-231 | 25.64 | | 14.70 | 2.57E+00 | 8.02E-01 | -1.61E+00 | 1.25E+00 |
| | | 84.21 | | 6.40 | 8.02E-01 | | -4.80E-01 | 3.93E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.91E+00 | 1.91E+00 | -1.53E-01 | 9.17E-01 |
| | PA-234 | 131.20 | | 20.40 | 2.24E-01 | 2.24E-01 | 1.10E-01 | 1.09E-01 |
| | | 733.99 | | 8.80 | 8.48E-01 | | 6.05E-02 | 3.95E-01 |
| | | 946.00 | | 12.00 | 7.07E-01 | | -1.10E-01 | 3.27E-01 |
| | PA-234M | 1001.03 | | 0.92 | 9.94E+00 | 9.94E+00 | -6.82E-01 | 4.61E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 2.68E+00 | 2.68E+00 | 1.99E+00 | 1.32E+00 |
| | U-235 | 143.76 | | 10.50 | 4.44E-01 | 4.44E-01 | 8.78E-02 | 2.16E-01 |
| | | 163.35 | | 4.70 | 9.60E-01 | | -1.08E-01 | 4.65E-01 |
| | | 205.31 | | 4.70 | 1.28E+00 | | -4.13E-01 | 6.24E-01 |
| | NP-237 | 86.50 | | 12.60 | 4.35E-01 | 4.35E-01 | 3.05E-01 | 2.13E-01 |
| | NP-239 | 106.10 | | 22.70 | 9.11E+11 | 9.11E+11 | 8.24E+10 | 4.43E+11 |
| | | 228.18 | | 10.70 | 2.82E+12 | | 2.75E+12 | 1.37E+12 |
| | | 277.60 | | 14.10 | 2.01E+12 | | 7.81E+11 | 9.69E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.63E-01 | 1.63E-01 | -1.48E-01 | 7.98E-02 |
| | AM-243 | 74.67 | | 66.00 | 1.10E-01 | 1.10E-01 | 1.10E-01 | 5.43E-02 |
| | CM-243 | 209.75 | | 3.29 | 1.86E+00 | 4.20E-01 | 7.23E-01 | 9.06E-01 |
| | | 228.14 | | 10.60 | 5.91E-01 | | 5.76E-01 | 2.87E-01 |
| | | 277.60 | | 14.00 | 4.20E-01 | | 1.63E-01 | 2.02E-01 |

Analysis Report for 1707087-14

HTC-A03-S002-4248-01

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

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***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S002-4248-01

Elapsed Live time: 3600
Elapsed Real Time: 3608

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 2 | 176 | 175 | 142 | 153 | 118 | 93 | 105 |
| 17: | 105 | 71 | 87 | 84 | 74 | 66 | 101 | 88 |
| 25: | 87 | 82 | 96 | 89 | 101 | 87 | 91 | 102 |
| 33: | 91 | 104 | 87 | 78 | 76 | 91 | 103 | 106 |
| 41: | 98 | 76 | 77 | 96 | 98 | 107 | 165 | 119 |
| 49: | 109 | 97 | 109 | 103 | 121 | 113 | 128 | 109 |
| 57: | 113 | 137 | 122 | 141 | 137 | 125 | 182 | 215 |
| 65: | 183 | 119 | 148 | 114 | 139 | 140 | 133 | 161 |
| 73: | 169 | 197 | 292 | 311 | 370 | 408 | 216 | 108 |
| 81: | 113 | 122 | 129 | 127 | 153 | 129 | 152 | 193 |
| 89: | 163 | 126 | 169 | 159 | 209 | 206 | 146 | 89 |
| 97: | 77 | 97 | 103 | 105 | 77 | 99 | 97 | 85 |
| 105: | 89 | 100 | 93 | 81 | 94 | 68 | 81 | 82 |
| 113: | 92 | 92 | 76 | 79 | 70 | 89 | 72 | 82 |
| 121: | 80 | 83 | 81 | 78 | 80 | 78 | 74 | 76 |
| 129: | 103 | 89 | 91 | 85 | 67 | 76 | 81 | 65 |
| 137: | 79 | 83 | 79 | 72 | 74 | 81 | 70 | 86 |
| 145: | 87 | 88 | 87 | 78 | 57 | 69 | 57 | 66 |
| 153: | 79 | 81 | 90 | 72 | 62 | 62 | 68 | 56 |
| 161: | 62 | 58 | 64 | 58 | 76 | 71 | 80 | 67 |
| 169: | 80 | 68 | 57 | 65 | 66 | 56 | 65 | 59 |
| 177: | 58 | 79 | 69 | 48 | 80 | 72 | 65 | 60 |
| 185: | 76 | 108 | 142 | 78 | 62 | 54 | 47 | 70 |
| 193: | 67 | 53 | 57 | 67 | 59 | 66 | 59 | 61 |
| 201: | 67 | 64 | 57 | 56 | 52 | 70 | 50 | 60 |
| 209: | 78 | 64 | 65 | 55 | 46 | 51 | 48 | 60 |
| 217: | 42 | 46 | 45 | 45 | 47 | 47 | 43 | 47 |
| 225: | 67 | 60 | 42 | 56 | 63 | 45 | 48 | 41 |
| 233: | 37 | 38 | 47 | 45 | 48 | 161 | 399 | 282 |
| 241: | 104 | 109 | 88 | 49 | 46 | 36 | 29 | 33 |
| 249: | 36 | 33 | 43 | 33 | 43 | 34 | 38 | 29 |
| 257: | 33 | 35 | 35 | 43 | 32 | 30 | 29 | 32 |
| 265: | 34 | 31 | 28 | 32 | 45 | 46 | 65 | 42 |
| 273: | 30 | 27 | 35 | 20 | 27 | 43 | 47 | 33 |
| 281: | 33 | 33 | 29 | 23 | 23 | 42 | 41 | 32 |
| 289: | 42 | 35 | 33 | 28 | 25 | 30 | 99 | 143 |
| 297: | 70 | 38 | 36 | 40 | 56 | 31 | 28 | 35 |
| 305: | 29 | 33 | 22 | 32 | 34 | 35 | 24 | 23 |
| 313: | 27 | 25 | 20 | 28 | 28 | 24 | 25 | 22 |
| 321: | 29 | 28 | 30 | 32 | 29 | 24 | 31 | 40 |
| 329: | 44 | 33 | 25 | 21 | 35 | 21 | 24 | 31 |
| 337: | 28 | 68 | 94 | 61 | 24 | 23 | 24 | 17 |
| 345: | 22 | 25 | 23 | 24 | 31 | 20 | 54 | 168 |
| 353: | 173 | 51 | 33 | 23 | 16 | 24 | 24 | 34 |
| 361: | 19 | 28 | 29 | 22 | 27 | 21 | 15 | 30 |

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|---|---|---|---|---|---|---|---|---|
| 369: | 24 | 19 | 26 | 17 | 20 | 23 | 26 | 18 |

Sample Title: HTC-A03-S002-4248-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 19 | 23 | 26 | 20 | 16 | 23 | 22 | 17 |
| 385: | 18 | 25 | 21 | 22 | 23 | 10 | 23 | 21 |
| 393: | 20 | 11 | 20 | 28 | 20 | 22 | 21 | 21 |
| 401: | 19 | 20 | 29 | 28 | 18 | 22 | 22 | 21 |
| 409: | 20 | 29 | 32 | 17 | 22 | 15 | 24 | 19 |
| 417: | 13 | 21 | 25 | 17 | 21 | 12 | 35 | 13 |
| 425: | 14 | 17 | 15 | 23 | 15 | 20 | 20 | 23 |
| 433: | 16 | 14 | 19 | 15 | 16 | 23 | 16 | 24 |
| 441: | 14 | 20 | 19 | 22 | 17 | 27 | 21 | 18 |
| 449: | 14 | 22 | 16 | 22 | 25 | 21 | 23 | 12 |
| 457: | 11 | 19 | 20 | 18 | 17 | 18 | 34 | 29 |
| 465: | 20 | 10 | 10 | 11 | 18 | 10 | 10 | 24 |
| 473: | 14 | 13 | 11 | 17 | 7 | 11 | 10 | 17 |
| 481: | 15 | 24 | 18 | 13 | 17 | 13 | 13 | 16 |
| 489: | 10 | 14 | 13 | 12 | 10 | 19 | 9 | 18 |
| 497: | 14 | 14 | 18 | 12 | 14 | 18 | 10 | 20 |
| 505: | 13 | 11 | 18 | 14 | 20 | 37 | 56 | 40 |
| 513: | 30 | 16 | 5 | 14 | 12 | 17 | 15 | 9 |
| 521: | 9 | 13 | 15 | 9 | 14 | 18 | 12 | 12 |
| 529: | 14 | 9 | 12 | 13 | 16 | 20 | 16 | 12 |
| 537: | 9 | 12 | 14 | 18 | 19 | 7 | 14 | 14 |
| 545: | 16 | 12 | 7 | 23 | 22 | 11 | 12 | 10 |
| 553: | 16 | 9 | 16 | 9 | 14 | 11 | 20 | 14 |
| 561: | 16 | 10 | 13 | 13 | 13 | 14 | 14 | 19 |
| 569: | 15 | 12 | 17 | 22 | 9 | 13 | 7 | 8 |
| 577: | 15 | 12 | 11 | 14 | 16 | 28 | 74 | 106 |
| 585: | 40 | 19 | 12 | 14 | 7 | 14 | 12 | 11 |
| 593: | 10 | 9 | 14 | 15 | 6 | 13 | 17 | 13 |
| 601: | 14 | 17 | 7 | 13 | 15 | 18 | 10 | 36 |
| 609: | 113 | 128 | 56 | 22 | 14 | 11 | 12 | 12 |
| 617: | 14 | 15 | 6 | 6 | 17 | 2 | 18 | 6 |
| 625: | 15 | 10 | 13 | 11 | 17 | 12 | 9 | 9 |
| 633: | 10 | 11 | 10 | 7 | 8 | 11 | 6 | 12 |
| 641: | 6 | 13 | 12 | 13 | 10 | 11 | 11 | 12 |
| 649: | 13 | 14 | 9 | 12 | 12 | 11 | 6 | 10 |
| 657: | 14 | 8 | 10 | 16 | 18 | 24 | 17 | 14 |
| 665: | 11 | 18 | 11 | 5 | 12 | 5 | 5 | 9 |
| 673: | 12 | 11 | 9 | 9 | 9 | 8 | 14 | 10 |
| 681: | 13 | 11 | 10 | 14 | 8 | 13 | 9 | 6 |
| 689: | 6 | 12 | 5 | 10 | 16 | 10 | 20 | 12 |
| 697: | 13 | 17 | 9 | 7 | 12 | 9 | 6 | 12 |
| 705: | 17 | 16 | 15 | 8 | 11 | 7 | 7 | 6 |
| 713: | 12 | 13 | 9 | 6 | 9 | 12 | 5 | 14 |
| 721: | 8 | 11 | 12 | 11 | 8 | 16 | 22 | 25 |
| 729: | 14 | 9 | 9 | 8 | 16 | 5 | 11 | 7 |
| 737: | 8 | 8 | 9 | 12 | 9 | 10 | 8 | 13 |
| 745: | 12 | 8 | 10 | 12 | 5 | 10 | 6 | 11 |
| 753: | 4 | 12 | 8 | 13 | 9 | 12 | 13 | 12 |
| 761: | 12 | 14 | 6 | 9 | 12 | 10 | 9 | 23 |
| 769: | 29 | 9 | 10 | 11 | 13 | 10 | 3 | 9 |
| 777: | 12 | 9 | 8 | 6 | 7 | 11 | 6 | 7 |
| 785: | 6 | 11 | 7 | 11 | 10 | 5 | 3 | 12 |
| 793: | 5 | 5 | 15 | 15 | 10 | 4 | 8 | 13 |

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|---|---|---|---|---|---|---|---|---|
| 801: | 10 | 7 | 18 | 9 | 8 | 15 | 12 | 10 |

Sample Title: HTC-A03-S002-4248-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 7 | 6 | 5 | 9 | 10 | 8 | 11 | 7 |
| 817: | 6 | 7 | 9 | 5 | 9 | 9 | 8 | 10 |
| 825: | 13 | 8 | 10 | 3 | 7 | 6 | 5 | 8 |
| 833: | 7 | 9 | 8 | 15 | 6 | 12 | 8 | 9 |
| 841: | 11 | 7 | 8 | 6 | 11 | 8 | 3 | 8 |
| 849: | 5 | 7 | 12 | 14 | 10 | 10 | 1 | 8 |
| 857: | 3 | 5 | 8 | 15 | 16 | 8 | 7 | 9 |
| 865: | 5 | 7 | 9 | 9 | 7 | 5 | 7 | 6 |
| 873: | 10 | 5 | 11 | 5 | 4 | 6 | 12 | 7 |
| 881: | 9 | 9 | 6 | 10 | 11 | 10 | 4 | 4 |
| 889: | 7 | 6 | 5 | 12 | 10 | 7 | 9 | 8 |
| 897: | 6 | 4 | 6 | 3 | 8 | 7 | 16 | 7 |
| 905: | 12 | 10 | 4 | 6 | 9 | 19 | 62 | 47 |
| 913: | 20 | 5 | 4 | 1 | 7 | 12 | 6 | 4 |
| 921: | 4 | 11 | 7 | 10 | 6 | 11 | 10 | 9 |
| 929: | 5 | 9 | 3 | 4 | 2 | 12 | 6 | 5 |
| 937: | 5 | 6 | 7 | 6 | 13 | 10 | 8 | 10 |
| 945: | 6 | 8 | 6 | 6 | 8 | 5 | 7 | 11 |
| 953: | 5 | 7 | 14 | 11 | 7 | 4 | 8 | 9 |
| 961: | 5 | 9 | 8 | 13 | 19 | 9 | 10 | 18 |
| 969: | 33 | 35 | 15 | 3 | 9 | 6 | 6 | 7 |
| 977: | 6 | 5 | 4 | 4 | 6 | 12 | 11 | 6 |
| 985: | 7 | 1 | 9 | 6 | 15 | 4 | 5 | 6 |
| 993: | 7 | 7 | 5 | 4 | 9 | 4 | 11 | 10 |
| 1001: | 9 | 6 | 8 | 7 | 11 | 8 | 8 | 5 |
| 1009: | 8 | 8 | 7 | 10 | 6 | 8 | 7 | 8 |
| 1017: | 9 | 13 | 7 | 4 | 3 | 6 | 13 | 8 |
| 1025: | 11 | 5 | 6 | 11 | 8 | 4 | 7 | 11 |
| 1033: | 8 | 8 | 8 | 3 | 10 | 6 | 8 | 7 |
| 1041: | 6 | 5 | 6 | 5 | 10 | 4 | 6 | 7 |
| 1049: | 9 | 6 | 4 | 9 | 12 | 10 | 7 | 6 |
| 1057: | 9 | 6 | 7 | 7 | 4 | 3 | 5 | 9 |
| 1065: | 10 | 6 | 7 | 8 | 8 | 3 | 7 | 3 |
| 1073: | 7 | 10 | 4 | 7 | 8 | 5 | 7 | 10 |
| 1081: | 6 | 5 | 8 | 6 | 5 | 10 | 10 | 5 |
| 1089: | 8 | 6 | 7 | 6 | 11 | 7 | 8 | 10 |
| 1097: | 7 | 8 | 10 | 9 | 11 | 6 | 8 | 7 |
| 1105: | 6 | 8 | 8 | 7 | 6 | 11 | 4 | 7 |
| 1113: | 5 | 8 | 7 | 7 | 8 | 10 | 10 | 31 |
| 1121: | 33 | 22 | 8 | 10 | 5 | 6 | 11 | 11 |
| 1129: | 4 | 6 | 6 | 6 | 8 | 9 | 9 | 8 |
| 1137: | 12 | 6 | 9 | 6 | 7 | 9 | 6 | 6 |
| 1145: | 7 | 7 | 8 | 6 | 1 | 2 | 8 | 5 |
| 1153: | 5 | 6 | 14 | 6 | 5 | 14 | 6 | 10 |
| 1161: | 8 | 6 | 9 | 9 | 6 | 6 | 4 | 10 |
| 1169: | 3 | 7 | 4 | 8 | 8 | 7 | 12 | 7 |
| 1177: | 11 | 14 | 6 | 11 | 7 | 8 | 8 | 17 |
| 1185: | 12 | 5 | 13 | 7 | 4 | 12 | 11 | 11 |
| 1193: | 9 | 11 | 12 | 4 | 5 | 7 | 6 | 6 |
| 1201: | 13 | 8 | 8 | 5 | 9 | 9 | 8 | 5 |
| 1209: | 11 | 16 | 4 | 11 | 7 | 6 | 9 | 11 |
| 1217: | 16 | 6 | 6 | 5 | 4 | 10 | 8 | 7 |
| 1225: | 9 | 10 | 13 | 10 | 10 | 4 | 9 | 9 |

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|---|---|---|---|---|---|---|---|---|
| 1233: | 11 | 10 | 10 | 8 | 4 | 22 | 20 | 8 |

Sample Title: HTC-A03-S002-4248-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 5 | 10 | 8 | 8 | 7 | 4 | 9 | 10 |
| 1249: | 5 | 10 | 7 | 9 | 10 | 9 | 8 | 4 |
| 1257: | 3 | 5 | 6 | 7 | 2 | 7 | 9 | 6 |
| 1265: | 6 | 6 | 5 | 6 | 8 | 5 | 6 | 7 |
| 1273: | 7 | 6 | 6 | 6 | 6 | 6 | 5 | 7 |
| 1281: | 4 | 4 | 6 | 5 | 6 | 8 | 9 | 7 |
| 1289: | 3 | 5 | 7 | 6 | 4 | 7 | 7 | 5 |
| 1297: | 3 | 2 | 6 | 6 | 7 | 3 | 6 | 4 |
| 1305: | 3 | 6 | 7 | 6 | 3 | 3 | 5 | 1 |
| 1313: | 5 | 4 | 4 | 2 | 6 | 4 | 6 | 5 |
| 1321: | 4 | 5 | 3 | 8 | 4 | 6 | 2 | 4 |
| 1329: | 3 | 7 | 5 | 3 | 3 | 4 | 5 | 6 |
| 1337: | 5 | 4 | 4 | 7 | 6 | 3 | 3 | 1 |
| 1345: | 3 | 7 | 4 | 6 | 3 | 2 | 6 | 5 |
| 1353: | 4 | 2 | 3 | 4 | 2 | 5 | 7 | 3 |
| 1361: | 4 | 3 | 3 | 4 | 4 | 1 | 1 | 3 |
| 1369: | 1 | 4 | 1 | 2 | 4 | 6 | 4 | 3 |
| 1377: | 11 | 2 | 4 | 2 | 4 | 2 | 2 | 2 |
| 1385: | 4 | 2 | 0 | 3 | 2 | 4 | 3 | 0 |
| 1393: | 1 | 4 | 4 | 1 | 0 | 2 | 1 | 4 |
| 1401: | 1 | 5 | 9 | 5 | 3 | 3 | 2 | 4 |
| 1409: | 4 | 2 | 1 | 5 | 2 | 2 | 6 | 0 |
| 1417: | 0 | 3 | 4 | 1 | 4 | 2 | 3 | 1 |
| 1425: | 0 | 2 | 2 | 5 | 2 | 0 | 4 | 3 |
| 1433: | 4 | 1 | 3 | 0 | 4 | 0 | 2 | 3 |
| 1441: | 0 | 5 | 8 | 3 | 1 | 1 | 3 | 1 |
| 1449: | 2 | 0 | 1 | 1 | 3 | 0 | 0 | 5 |
| 1457: | 4 | 12 | 59 | 195 | 238 | 140 | 25 | 2 |
| 1465: | 0 | 1 | 2 | 2 | 1 | 2 | 3 | 0 |
| 1473: | 1 | 3 | 1 | 2 | 1 | 2 | 4 | 2 |
| 1481: | 3 | 0 | 2 | 1 | 1 | 1 | 1 | 3 |
| 1489: | 2 | 0 | 2 | 0 | 0 | 2 | 1 | 4 |
| 1497: | 3 | 1 | 2 | 1 | 0 | 1 | 1 | 2 |
| 1505: | 0 | 2 | 3 | 5 | 5 | 3 | 1 | 0 |
| 1513: | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 2 |
| 1521: | 0 | 0 | 3 | 2 | 4 | 1 | 3 | 2 |
| 1529: | 1 | 2 | 0 | 1 | 1 | 1 | 2 | 0 |
| 1537: | 0 | 2 | 1 | 0 | 2 | 1 | 1 | 1 |
| 1545: | 1 | 0 | 2 | 1 | 0 | 2 | 1 | 1 |
| 1553: | 2 | 2 | 0 | 4 | 0 | 1 | 3 | 2 |
| 1561: | 3 | 0 | 1 | 3 | 1 | 4 | 1 | 1 |
| 1569: | 1 | 1 | 0 | 3 | 1 | 1 | 1 | 0 |
| 1577: | 1 | 0 | 3 | 1 | 3 | 2 | 3 | 1 |
| 1585: | 0 | 3 | 4 | 3 | 7 | 2 | 4 | 7 |
| 1593: | 3 | 3 | 3 | 1 | 1 | 0 | 1 | 2 |
| 1601: | 0 | 1 | 1 | 1 | 4 | 1 | 2 | 3 |
| 1609: | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 1617: | 1 | 3 | 3 | 2 | 3 | 1 | 1 | 1 |
| 1625: | 2 | 2 | 2 | 1 | 0 | 3 | 4 | 3 |
| 1633: | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 1641: | 1 | 2 | 0 | 3 | 4 | 3 | 0 | 0 |
| 1649: | 1 | 3 | 1 | 0 | 2 | 2 | 0 | 2 |
| 1657: | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 2 |

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|---|---|---|---|---|---|---|---|---|
| 1665: | 3 | 2 | 2 | 1 | 1 | 0 | 2 | 1 |

Sample Title: HTC-A03-S002-4248-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 2 | 0 | 0 | 0 | 0 | 1 | 4 | 0 |
| 1681: | 1 | 0 | 1 | 1 | 3 | 2 | 0 | 0 |
| 1689: | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 2 |
| 1697: | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 1 |
| 1705: | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 |
| 1713: | 3 | 2 | 0 | 1 | 1 | 1 | 1 | 1 |
| 1721: | 1 | 1 | 1 | 0 | 1 | 3 | 0 | 3 |
| 1729: | 3 | 5 | 1 | 3 | 1 | 0 | 1 | 3 |
| 1737: | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 1 |
| 1745: | 0 | 0 | 3 | 1 | 1 | 2 | 0 | 2 |
| 1753: | 1 | 0 | 3 | 0 | 1 | 1 | 1 | 1 |
| 1761: | 2 | 0 | 6 | 14 | 20 | 9 | 1 | 2 |
| 1769: | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 3 |
| 1777: | 2 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 1785: | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 |
| 1793: | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1801: | 0 | 2 | 1 | 0 | 0 | 1 | 1 | 2 |
| 1809: | 3 | 1 | 2 | 0 | 1 | 1 | 0 | 0 |
| 1817: | 0 | 1 | 2 | 0 | 1 | 0 | 1 | 0 |
| 1825: | 0 | 1 | 2 | 2 | 0 | 0 | 1 | 2 |
| 1833: | 0 | 2 | 0 | 1 | 1 | 0 | 1 | 0 |
| 1841: | 0 | 1 | 1 | 0 | 3 | 1 | 1 | 3 |
| 1849: | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 1857: | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 2 |
| 1865: | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| 1873: | 1 | 2 | 1 | 3 | 0 | 1 | 1 | 0 |
| 1881: | 1 | 1 | 2 | 2 | 1 | 1 | 3 | 0 |
| 1889: | 0 | 0 | 2 | 1 | 1 | 2 | 2 | 2 |
| 1897: | 2 | 0 | 1 | 0 | 1 | 2 | 0 | 2 |
| 1905: | 0 | 2 | 3 | 0 | 3 | 0 | 0 | 2 |
| 1913: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 |
| 1921: | 2 | 0 | 1 | 0 | 0 | 4 | 0 | 0 |
| 1929: | 0 | 0 | 2 | 0 | 0 | 1 | 4 | 1 |
| 1937: | 0 | 0 | 3 | 1 | 2 | 0 | 1 | 0 |
| 1945: | 3 | 0 | 0 | 2 | 1 | 1 | 0 | 1 |
| 1953: | 0 | 3 | 1 | 1 | 0 | 1 | 0 | 1 |
| 1961: | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1969: | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 2 |
| 1977: | 1 | 2 | 0 | 0 | 2 | 1 | 0 | 1 |
| 1985: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1993: | 0 | 1 | 0 | 3 | 0 | 2 | 1 | 2 |
| 2001: | 1 | 2 | 2 | 0 | 2 | 3 | 0 | 1 |
| 2009: | 2 | 1 | 2 | 1 | 1 | 2 | 0 | 0 |
| 2017: | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 |
| 2025: | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2033: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| 2041: | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 2 |
| 2049: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2057: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2065: | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 1 |
| 2073: | 0 | 2 | 4 | 0 | 0 | 1 | 5 | 0 |
| 2081: | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 1 |
| 2089: | 1 | 1 | 0 | 1 | 2 | 2 | 0 | 1 |

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|---|---|---|---|---|---|---|---|---|
| 2097: | 1 | 0 | 0 | 3 | 2 | 2 | 2 | 3 |

Sample Title: HTC-A03-S002-4248-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 3 | 0 | 2 | 2 | 4 | 0 | 0 | 3 |
| 2113: | 0 | 1 | 0 | 0 | 2 | 1 | 1 | 0 |
| 2121: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 2129: | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 2 |
| 2137: | 1 | 0 | 1 | 2 | 0 | 1 | 0 | 0 |
| 2145: | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 2 |
| 2153: | 2 | 0 | 2 | 2 | 1 | 1 | 0 | 0 |
| 2161: | 0 | 0 | 2 | 0 | 3 | 0 | 1 | 1 |
| 2169: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2177: | 2 | 2 | 1 | 0 | 0 | 2 | 0 | 1 |
| 2185: | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2193: | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2201: | 1 | 1 | 6 | 7 | 5 | 1 | 1 | 0 |
| 2209: | 2 | 2 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2217: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2225: | 0 | 1 | 0 | 0 | 2 | 2 | 2 | 2 |
| 2233: | 3 | 2 | 1 | 1 | 2 | 0 | 2 | 1 |
| 2241: | 0 | 0 | 0 | 2 | 1 | 2 | 1 | 0 |
| 2249: | 0 | 3 | 2 | 2 | 0 | 1 | 3 | 0 |
| 2257: | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 4 |
| 2265: | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2273: | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 |
| 2281: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 2289: | 2 | 0 | 0 | 3 | 2 | 3 | 0 | 2 |
| 2297: | 0 | 1 | 2 | 2 | 1 | 2 | 2 | 1 |
| 2305: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2313: | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 2321: | 1 | 0 | 2 | 1 | 2 | 0 | 1 | 2 |
| 2329: | 1 | 1 | 0 | 1 | 0 | 0 | 2 | 0 |
| 2337: | 0 | 0 | 2 | 2 | 2 | 0 | 1 | 0 |
| 2345: | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 1 |
| 2353: | 1 | 0 | 2 | 0 | 2 | 2 | 2 | 0 |
| 2361: | 2 | 1 | 1 | 0 | 1 | 2 | 2 | 0 |
| 2369: | 0 | 0 | 1 | 2 | 3 | 3 | 1 | 0 |
| 2377: | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 0 |
| 2385: | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2393: | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 2401: | 0 | 1 | 1 | 1 | 3 | 3 | 2 | 0 |
| 2409: | 1 | 1 | 2 | 0 | 6 | 1 | 1 | 2 |
| 2417: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 2 |
| 2425: | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 |
| 2433: | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 2441: | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 |
| 2449: | 0 | 3 | 0 | 1 | 1 | 0 | 1 | 1 |
| 2457: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2465: | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 2473: | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 |
| 2481: | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| 2489: | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2497: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2505: | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2513: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2521: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |

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|---|---|---|---|---|---|---|---|---|
| 2529: | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-4248-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2545: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2553: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2569: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2577: | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 |
| 2585: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2593: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 2601: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2609: | 0 | 1 | 2 | 4 | 11 | 22 | 14 | 4 |
| 2617: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2625: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2633: | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| 2641: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2649: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2657: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2665: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2673: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2681: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2689: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2697: | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 |
| 2705: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2713: | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 1 |
| 2721: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2737: | 2 | 1 | 3 | 0 | 0 | 0 | 0 | 0 |
| 2745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2761: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2769: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2777: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2793: | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 2801: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2809: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2833: | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2841: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2865: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2873: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2881: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2889: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2905: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2913: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| 2921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2929: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2937: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2945: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

Sample Title: HTC-A03-S002-4248-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3009: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |
| 3033: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3057: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3073: | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 3081: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3177: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3193: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3217: | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3233: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3241: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3257: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3273: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 3281: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3297: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3385: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S002-4248-01

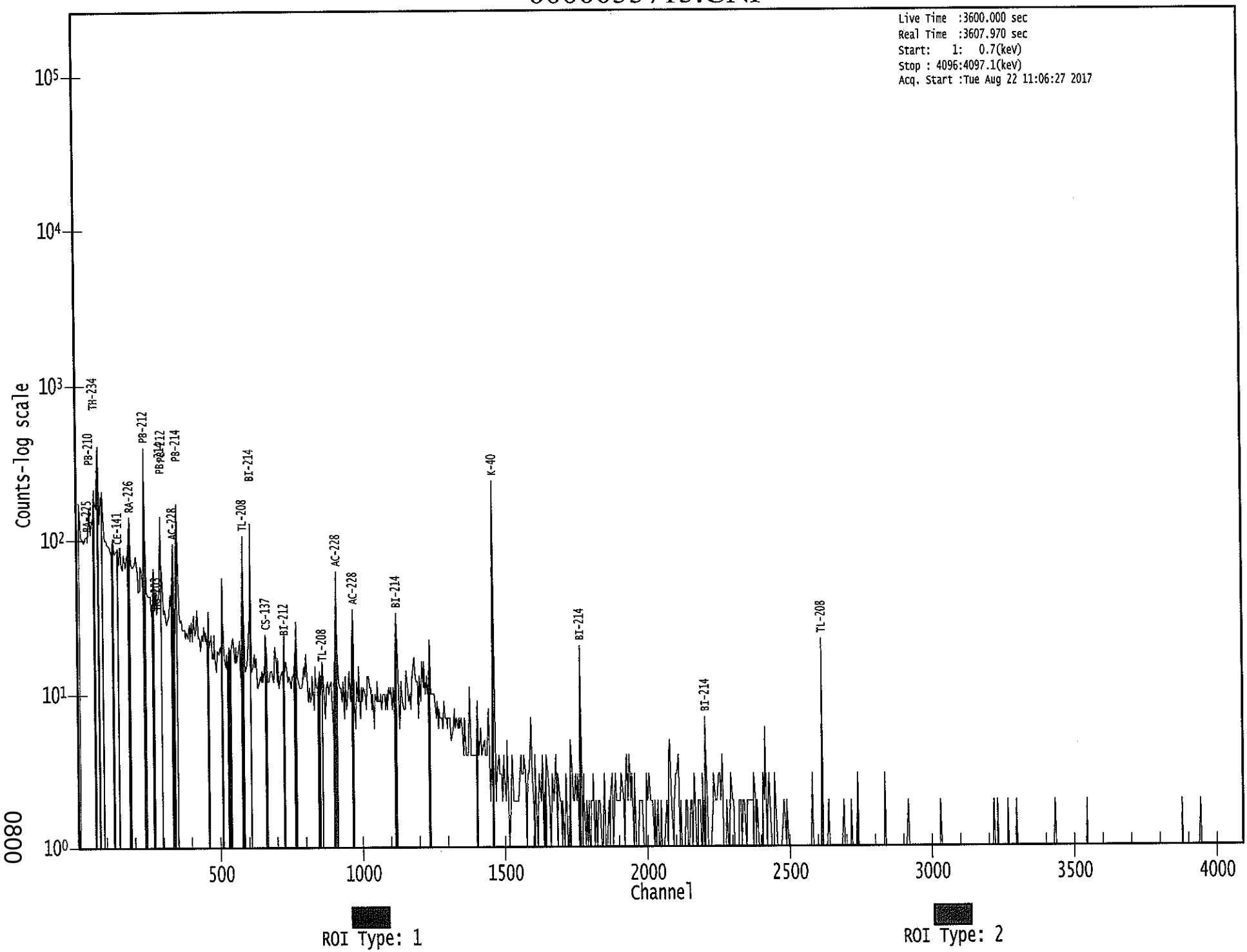
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3409: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3425: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3433: | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3457: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3545: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3601: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3617: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3753: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3769: | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Sample Title: HTC-A03-S002-4248-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 4033: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

# 0000055715.CNF




0080

Apex-Gamma

Analysis Report for 1707087-15
HTC-A03-S003-0006-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-15 |
| Sample Description | : HTC-A03-S003-0006-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.017E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:45:52AM |
| Acquisition Started | : 8/22/2017 11:21:35AM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE4 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3624.0 seconds |
| Dead Time | : 0.66 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 15 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55716 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG 8/23/17

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 12:22:01PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 46.39 | 45.44 | 0.0000 | 0.00 |
| 2 | 62.50 | 61.55 | 0.0000 | 0.00 |
| 3 | 76.20 | 75.25 | 0.0000 | 0.00 |
| 4 | 83.72 | 82.78 | 0.0000 | 0.00 |
| 5 | 87.62 | 86.68 | 0.0000 | 0.00 |
| 6 | 92.55 | 91.61 | 0.0000 | 0.00 |
| 7 | 130.06 | 129.13 | 0.0000 | 0.00 |
| 8 | 182.37 | 181.46 | 0.0000 | 0.00 |
| 9 | 186.32 | 185.42 | 0.0000 | 0.00 |
| 10 | 209.71 | 208.81 | 0.0000 | 0.00 |
| 11 | 238.75 | 237.86 | 0.0000 | 0.00 |
| 12 | 241.68 | 240.79 | 0.0000 | 0.00 |
| 13 | 271.03 | 270.15 | 0.0000 | 0.00 |
| 14 | 295.00 | 294.13 | 0.0000 | 0.00 |
| 15 | 300.34 | 299.47 | 0.0000 | 0.00 |
| 16 | 339.03 | 338.17 | 0.0000 | 0.00 |
| 17 | 351.41 | 350.56 | 0.0000 | 0.00 |
| 18 | 408.81 | 407.98 | 0.0000 | 0.00 |
| 19 | 462.17 | 461.35 | 0.0000 | 0.00 |
| 20 | 511.49 | 510.69 | 0.0000 | 0.00 |
| 21 | 577.77 | 577.00 | 0.0000 | 0.00 |
| 22 | 583.29 | 582.52 | 0.0000 | 0.00 |
| 23 | 609.51 | 608.75 | 0.0000 | 0.00 |
| 24 | 626.69 | 625.93 | 0.0000 | 0.00 |
| 25 | 661.86 | 661.12 | 0.0000 | 0.00 |
| 26 | 728.51 | 727.80 | 0.0000 | 0.00 |
| 27 | 768.96 | 768.27 | 0.0000 | 0.00 |
| 28 | 859.27 | 858.61 | 0.0000 | 0.00 |
| 29 | 911.41 | 910.78 | 0.0000 | 0.00 |
| 30 | 954.56 | 953.94 | 0.0000 | 0.00 |
| 31 | 964.61 | 964.00 | 0.0000 | 0.00 |
| 32 | 968.37 | 967.75 | 0.0000 | 0.00 |
| 33 | 1120.49 | 1119.95 | 0.0000 | 0.00 |
| 34 | 1272.39 | 1271.91 | 0.0000 | 0.00 |
| 35 | 1377.47 | 1377.05 | 0.0000 | 0.00 |
| 36 | 1460.54 | 1460.16 | 0.0000 | 0.00 |
| 37 | 1592.53 | 1592.22 | 0.0000 | 0.00 |
| 38 | 1629.29 | 1629.00 | 0.0000 | 0.00 |
| 39 | 2613.60 | 2613.91 | 0.0000 | 0.00 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 12:22:01PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 46.39 | 42 - | 49 | 45.44 | 1.05E+02 | 83.71 | 1.10E+03 | 2.74 |
| | 2 | 62.50 | 58 - | 65 | 61.55 | 1.44E+02 | 97.53 | 1.50E+03 | 2.58 |
| | 3 | 76.20 | 69 - | 80 | 75.25 | 9.21E+02 | 149.28 | 2.32E+03 | 4.07 |
| M | 4 | 83.72 | 81 - | 95 | 82.78 | 7.59E+01 | 54.55 | 6.80E+02 | 1.92 |
| m | 5 | 87.62 | 81 - | 95 | 86.68 | 2.52E+02 | 114.51 | 1.64E+03 | 3.20 |
| m | 6 | 92.55 | 81 - | 95 | 91.61 | 2.81E+02 | 95.04 | 1.25E+03 | 3.21 |
| | 7 | 130.06 | 127 - | 132 | 129.13 | 5.69E+01 | 62.72 | 7.28E+02 | 3.49 |
| M | 8 | 182.37 | 180 - | 189 | 181.46 | 2.95E+01 | 23.73 | 1.66E+02 | 1.48 |
| m | 9 | 186.32 | 180 - | 189 | 185.42 | 1.53E+02 | 70.46 | 7.20E+02 | 2.75 |
| | 10 | 209.71 | 205 - | 212 | 208.81 | 8.25E+01 | 62.86 | 5.95E+02 | 3.20 |
| M | 11 | 238.75 | 231 - | 246 | 237.86 | 5.18E+02 | 68.60 | 4.19E+02 | 2.33 |
| m | 12 | 241.68 | 231 - | 246 | 240.79 | 1.31E+02 | 69.84 | 4.23E+02 | 2.33 |
| | 13 | 271.03 | 267 - | 273 | 270.15 | 5.69E+01 | 45.30 | 3.30E+02 | 3.58 |
| | 14 | 295.00 | 288 - | 297 | 294.13 | 2.04E+02 | 62.15 | 4.37E+02 | 2.20 |
| | 15 | 300.34 | 298 - | 302 | 299.47 | 3.59E+01 | 32.15 | 1.98E+02 | 2.15 |
| | 16 | 339.03 | 332 - | 342 | 338.17 | 8.38E+01 | 57.46 | 3.94E+02 | 2.18 |
| | 17 | 351.41 | 344 - | 357 | 350.56 | 2.80E+02 | 74.83 | 5.00E+02 | 2.27 |
| | 18 | 408.81 | 404 - | 411 | 407.98 | 3.37E+01 | 39.19 | 2.29E+02 | 4.46 |
| | 19 | 462.17 | 459 - | 465 | 461.35 | 2.59E+01 | 32.38 | 1.72E+02 | 1.49 |
| | 20 | 511.49 | 506 - | 516 | 510.69 | 1.01E+02 | 44.88 | 1.99E+02 | 3.22 |
| M | 21 | 577.77 | 576 - | 594 | 577.00 | 2.04E+01 | 12.39 | 2.77E+01 | 2.30 |
| m | 22 | 583.29 | 576 - | 594 | 582.52 | 1.50E+02 | 34.12 | 8.46E+01 | 2.79 |
| | 23 | 609.51 | 604 - | 616 | 608.75 | 1.80E+02 | 48.39 | 1.98E+02 | 2.80 |
| | 24 | 626.69 | 622 - | 631 | 625.93 | 2.59E+01 | 30.94 | 1.14E+02 | 1.14 |
| | 25 | 661.86 | 656 - | 665 | 661.12 | 6.07E+01 | 40.95 | 2.05E+02 | 1.57 |
| | 26 | 728.51 | 724 - | 731 | 727.80 | 3.06E+01 | 26.61 | 9.29E+01 | 5.56 |
| | 27 | 768.96 | 763 - | 774 | 768.27 | 2.97E+01 | 35.61 | 1.43E+02 | 5.76 |
| | 28 | 859.27 | 854 - | 863 | 858.61 | 2.25E+01 | 26.80 | 8.89E+01 | 1.75 |
| | 29 | 911.41 | 906 - | 917 | 910.78 | 8.37E+01 | 34.00 | 1.05E+02 | 2.26 |
| | 30 | 954.56 | 949 - | 957 | 953.94 | 2.05E+01 | 22.17 | 6.30E+01 | 3.71 |
| M | 31 | 964.61 | 961 - | 972 | 964.00 | 1.74E+01 | 16.16 | 5.35E+01 | 2.45 |
| m | 32 | 968.37 | 961 - | 972 | 967.75 | 4.69E+01 | 26.61 | 7.84E+01 | 2.70 |
| | 33 | 1120.49 | 1114 - | 1125 | 1119.95 | 4.82E+01 | 28.57 | 7.76E+01 | 2.30 |
| | 34 | 1272.39 | 1267 - | 1275 | 1271.91 | 1.92E+01 | 21.34 | 5.76E+01 | 3.21 |
| | 35 | 1377.47 | 1372 - | 1382 | 1377.05 | 1.75E+01 | 17.82 | 3.30E+01 | 1.19 |
| | 36 | 1460.54 | 1453 - | 1466 | 1460.16 | 4.19E+02 | 43.21 | 2.11E+01 | 2.93 |
| | 37 | 1592.53 | 1590 - | 1595 | 1592.22 | 7.17E+00 | 6.71 | 3.67E+00 | 2.83 |
| | 38 | 1629.29 | 1626 - | 1633 | 1629.00 | 1.07E+01 | 8.25 | 4.69E+00 | 1.05 |
| | 39 | 2613.60 | 2609 - | 2617 | 2613.91 | 3.40E+01 | 13.87 | 8.05E+00 | 2.79 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 12:22:01PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 46.39 | 42 - | 49 | 1.05E+02 | 83.71 | 1.10E+03 | 6.67E+01 |
| | 2 | 62.50 | 58 - | 65 | 1.44E+02 | 97.53 | 1.50E+03 | 7.77E+01 |
| | 3 | 76.20 | 69 - | 80 | 9.21E+02 | 149.28 | 2.32E+03 | 1.12E+02 |
| M | 4 | 83.72 | 81 - | 95 | 7.59E+01 | 54.55 | 6.80E+02 | 4.29E+01 |
| m | 5 | 87.62 | 81 - | 95 | 2.52E+02 | 114.51 | 1.64E+03 | 6.66E+01 |
| m | 6 | 92.55 | 81 - | 95 | 2.81E+02 | 95.04 | 1.25E+03 | 5.82E+01 |
| | 7 | 130.06 | 127 - | 132 | 5.69E+01 | 62.72 | 7.28E+02 | 5.00E+01 |
| M | 8 | 182.37 | 180 - | 189 | 2.95E+01 | 23.73 | 1.66E+02 | 2.12E+01 |
| m | 9 | 186.32 | 180 - | 189 | 1.53E+02 | 70.46 | 7.20E+02 | 4.41E+01 |
| | 10 | 209.71 | 205 - | 212 | 8.25E+01 | 62.86 | 5.95E+02 | 4.95E+01 |
| M | 11 | 238.75 | 231 - | 246 | 5.18E+02 | 68.60 | 4.19E+02 | 3.36E+01 |
| m | 12 | 241.68 | 231 - | 246 | 1.31E+02 | 69.84 | 4.23E+02 | 3.38E+01 |
| | 13 | 271.03 | 267 - | 273 | 5.69E+01 | 45.30 | 3.30E+02 | 3.51E+01 |
| | 14 | 295.00 | 288 - | 297 | 2.04E+02 | 62.15 | 4.37E+02 | 4.54E+01 |
| | 15 | 300.34 | 298 - | 302 | 3.59E+01 | 32.15 | 1.98E+02 | 2.45E+01 |
| | 16 | 339.03 | 332 - | 342 | 8.38E+01 | 57.46 | 3.94E+02 | 4.48E+01 |
| | 17 | 351.41 | 344 - | 357 | 2.80E+02 | 74.83 | 5.00E+02 | 5.50E+01 |
| | 18 | 408.81 | 404 - | 411 | 3.37E+01 | 39.19 | 2.29E+02 | 3.08E+01 |
| | 19 | 462.17 | 459 - | 465 | 2.59E+01 | 32.38 | 1.72E+02 | 2.53E+01 |
| | 20 | 511.49 | 506 - | 516 | 1.01E+02 | 44.88 | 1.99E+02 | 3.30E+01 |
| M | 21 | 577.77 | 576 - | 594 | 2.04E+01 | 12.39 | 2.77E+01 | 8.66E+00 |
| m | 22 | 583.29 | 576 - | 594 | 1.50E+02 | 34.12 | 8.46E+01 | 1.51E+01 |
| | 23 | 609.51 | 604 - | 616 | 1.80E+02 | 48.39 | 1.98E+02 | 3.31E+01 |
| | 24 | 626.69 | 622 - | 631 | 2.59E+01 | 30.94 | 1.14E+02 | 2.40E+01 |
| | 25 | 661.86 | 656 - | 665 | 6.07E+01 | 40.95 | 2.05E+02 | 3.11E+01 |
| | 26 | 728.51 | 724 - | 731 | 3.06E+01 | 26.61 | 9.29E+01 | 1.99E+01 |
| | 27 | 768.96 | 763 - | 774 | 2.97E+01 | 35.61 | 1.43E+02 | 2.79E+01 |
| | 28 | 859.27 | 854 - | 863 | 2.25E+01 | 26.80 | 8.89E+01 | 2.06E+01 |
| | 29 | 911.41 | 906 - | 917 | 8.37E+01 | 34.00 | 1.05E+02 | 2.36E+01 |
| | 30 | 954.56 | 949 - | 957 | 2.05E+01 | 22.17 | 6.30E+01 | 1.66E+01 |
| M | 31 | 964.61 | 961 - | 972 | 1.74E+01 | 16.16 | 5.35E+01 | 1.20E+01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| m | 32 | 968.37 | 961 - | 972 | 4.69E+01 | 26.61 | 7.84E+01 | 1.46E+01 |
| | 33 | 1120.49 | 1114 - | 1125 | 4.82E+01 | 28.57 | 7.76E+01 | 2.05E+01 |
| | 34 | 1272.39 | 1267 - | 1275 | 1.92E+01 | 21.34 | 5.76E+01 | 1.60E+01 |
| | 35 | 1377.47 | 1372 - | 1382 | 1.75E+01 | 17.82 | 3.30E+01 | 1.29E+01 |
| | 36 | 1460.54 | 1453 - | 1466 | 4.19E+02 | 43.21 | 2.11E+01 | 1.13E+01 |
| | 37 | 1592.53 | 1590 - | 1595 | 7.17E+00 | 6.71 | 3.67E+00 | 3.32E+00 |
| | 38 | 1629.29 | 1626 - | 1633 | 1.07E+01 | 8.25 | 4.69E+00 | 4.14E+00 |
| | 39 | 2613.60 | 2609 - | 2617 | 3.40E+01 | 13.87 | 8.05E+00 | 6.18E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 12:22:01PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 46.39 | 42 - | 49 | 45.44 | 1.05E+02 | 83.71 | 1.10E+03 | PB-210 |
| | 2 | 62.50 | 58 - | 65 | 61.55 | 1.44E+02 | 97.53 | 1.50E+03 | TH-230 |
| | | | | | | | | | TH-234 |
| | 3 | 76.20 | 69 - | 80 | 75.25 | 9.21E+02 | 149.28 | 2.32E+03 | ..... |
| M | 4 | 83.72 | 81 - | 95 | 82.78 | 7.59E+01 | 54.55 | 6.80E+02 | TH-231 |
| m | 5 | 87.62 | 81 - | 95 | 86.68 | 2.52E+02 | 114.51 | 1.64E+03 | SN-126 |
| | | | | | | | | | CD-109 |
| | | | | | | | | | LU-176 |
| m | 6 | 92.55 | 81 - | 95 | 91.61 | 2.81E+02 | 95.04 | 1.25E+03 | GA-67 |
| | 7 | 130.06 | 127 - | 132 | 129.13 | 5.69E+01 | 62.72 | 7.28E+02 | ..... |
| M | 8 | 182.37 | 180 - | 189 | 181.46 | 2.95E+01 | 23.73 | 1.66E+02 | LU-172 |
| m | 9 | 186.32 | 180 - | 189 | 185.42 | 1.53E+02 | 70.46 | 7.20E+02 | RA-226 |
| | 10 | 209.71 | 205 - | 212 | 208.81 | 8.25E+01 | 62.86 | 5.95E+02 | CM-243 |
| | | | | | | | | | GA-67 |
| M | 11 | 238.75 | 231 - | 246 | 237.86 | 5.18E+02 | 68.60 | 4.19E+02 | PB-212 |
| m | 12 | 241.68 | 231 - | 246 | 240.79 | 1.31E+02 | 69.84 | 4.23E+02 | RA-224 |
| | 13 | 271.03 | 267 - | 273 | 270.15 | 5.69E+01 | 45.30 | 3.30E+02 | ..... |
| | 14 | 295.00 | 288 - | 297 | 294.13 | 2.04E+02 | 62.15 | 4.37E+02 | PB-214 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 15 | 300.34 | 298 - | 302 | 299.47 | 3.59E+01 | 32.15 | 1.98E+02 | GA-67<br>PB-212<br>BI-210M |
| | 16 | 339.03 | 332 - | 342 | 338.17 | 8.38E+01 | 57.46 | 3.94E+02 | AC-228 |
| | 17 | 351.41 | 344 - | 357 | 350.56 | 2.80E+02 | 74.83 | 5.00E+02 | PB-214 |
| | 18 | 408.81 | 404 - | 411 | 407.98 | 3.37E+01 | 39.19 | 2.29E+02 | ..... |
| | 19 | 462.17 | 459 - | 465 | 461.35 | 2.59E+01 | 32.38 | 1.72E+02 | ..... |
| | 20 | 511.49 | 506 - | 516 | 510.69 | 1.01E+02 | 44.88 | 1.99E+02 | ..... |
| M | 21 | 577.77 | 576 - | 594 | 577.00 | 2.04E+01 | 12.39 | 2.77E+01 | ..... |
| m | 22 | 583.29 | 576 - | 594 | 582.52 | 1.50E+02 | 34.12 | 8.46E+01 | TL-208 |
| | 23 | 609.51 | 604 - | 616 | 608.75 | 1.80E+02 | 48.39 | 1.98E+02 | BI-214 |
| | 24 | 626.69 | 622 - | 631 | 625.93 | 2.59E+01 | 30.94 | 1.14E+02 | ..... |
| | 25 | 661.86 | 656 - | 665 | 661.12 | 6.07E+01 | 40.95 | 2.05E+02 | CS-137 |
| | 26 | 728.51 | 724 - | 731 | 727.80 | 3.06E+01 | 26.61 | 9.29E+01 | ..... |
| | 27 | 768.96 | 763 - | 774 | 768.27 | 2.97E+01 | 35.61 | 1.43E+02 | ..... |
| | 28 | 859.27 | 854 - | 863 | 858.61 | 2.25E+01 | 26.80 | 8.89E+01 | ..... |
| | 29 | 911.41 | 906 - | 917 | 910.78 | 8.37E+01 | 34.00 | 1.05E+02 | TL-204<br>AC-228 |
| | 30 | 954.56 | 949 - | 957 | 953.94 | 2.05E+01 | 22.17 | 6.30E+01 | ..... |
| M | 31 | 964.61 | 961 - | 972 | 964.00 | 1.74E+01 | 16.16 | 5.35E+01 | EU-152 |
| m | 32 | 968.37 | 961 - | 972 | 967.75 | 4.69E+01 | 26.61 | 7.84E+01 | AC-228 |
| | 33 | 1120.49 | 1114 - | 1125 | 1119.95 | 4.82E+01 | 28.57 | 7.76E+01 | SC-46<br>BI-214<br>TA-182 |
| | 34 | 1272.39 | 1267 - | 1275 | 1271.91 | 1.92E+01 | 21.34 | 5.76E+01 | ..... |
| | 35 | 1377.47 | 1372 - | 1382 | 1377.05 | 1.75E+01 | 17.82 | 3.30E+01 | ..... |
| | 36 | 1460.54 | 1453 - | 1466 | 1460.16 | 4.19E+02 | 43.21 | 2.11E+01 | K-40 |
| | 37 | 1592.53 | 1590 - | 1595 | 1592.22 | 7.17E+00 | 6.71 | 3.67E+00 | ..... |
| | 38 | 1629.29 | 1626 - | 1633 | 1629.00 | 1.07E+01 | 8.25 | 4.69E+00 | ..... |
| | 39 | 2613.60 | 2609 - | 2617 | 2613.91 | 3.40E+01 | 13.87 | 8.05E+00 | ..... |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 12:22:01PM

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 46.39 | 1.05E+02 | 83.71 | 1.64E-02 | 1.56E-03 |
| | 2 | 62.50 | 1.44E+02 | 97.53 | 2.14E-02 | 1.62E-03 |
| | 3 | 76.20 | 9.21E+02 | 149.28 | 2.32E-02 | 1.91E-03 |
| M | 4 | 83.72 | 7.59E+01 | 54.55 | 2.36E-02 | 2.07E-03 |
| m | 5 | 87.62 | 2.52E+02 | 114.51 | 2.37E-02 | 2.16E-03 |
| m | 6 | 92.55 | 2.81E+02 | 95.04 | 2.37E-02 | 2.10E-03 |
| | 7 | 130.06 | 5.69E+01 | 62.72 | 2.15E-02 | 1.62E-03 |
| M | 8 | 182.37 | 2.95E+01 | 23.73 | 1.72E-02 | 1.41E-03 |
| m | 9 | 186.32 | 1.53E+02 | 70.46 | 1.69E-02 | 1.40E-03 |
| | 10 | 209.71 | 8.25E+01 | 62.86 | 1.53E-02 | 1.28E-03 |
| M | 11 | 238.75 | 5.18E+02 | 68.60 | 1.36E-02 | 1.14E-03 |
| m | 12 | 241.68 | 1.31E+02 | 69.84 | 1.34E-02 | 1.13E-03 |
| | 13 | 271.03 | 5.69E+01 | 45.30 | 1.20E-02 | 9.86E-04 |
| | 14 | 295.00 | 2.04E+02 | 62.15 | 1.10E-02 | 9.14E-04 |
| | 15 | 300.34 | 3.59E+01 | 32.15 | 1.08E-02 | 9.02E-04 |
| | 16 | 339.03 | 8.38E+01 | 57.46 | 9.58E-03 | 8.21E-04 |
| | 17 | 351.41 | 2.80E+02 | 74.83 | 9.23E-03 | 7.95E-04 |
| | 18 | 408.81 | 3.37E+01 | 39.19 | 7.89E-03 | 7.03E-04 |
| | 19 | 462.17 | 2.59E+01 | 32.38 | 6.96E-03 | 6.81E-04 |
| | 20 | 511.49 | 1.01E+02 | 44.88 | 6.28E-03 | 6.61E-04 |
| M | 21 | 577.77 | 2.04E+01 | 12.39 | 5.56E-03 | 6.33E-04 |
| m | 22 | 583.29 | 1.50E+02 | 34.12 | 5.50E-03 | 6.31E-04 |
| | 23 | 609.51 | 1.80E+02 | 48.39 | 5.27E-03 | 6.20E-04 |
| | 24 | 626.69 | 2.59E+01 | 30.94 | 5.13E-03 | 6.13E-04 |
| | 25 | 661.86 | 6.07E+01 | 40.95 | 4.87E-03 | 5.98E-04 |
| | 26 | 728.51 | 3.06E+01 | 26.61 | 4.44E-03 | 5.15E-04 |
| | 27 | 768.96 | 2.97E+01 | 35.61 | 4.22E-03 | 4.64E-04 |
| | 28 | 859.27 | 2.25E+01 | 26.80 | 3.82E-03 | 3.51E-04 |
| | 29 | 911.41 | 8.37E+01 | 34.00 | 3.62E-03 | 2.99E-04 |
| | 30 | 954.56 | 2.05E+01 | 22.17 | 3.47E-03 | 2.89E-04 |
| M | 31 | 964.61 | 1.74E+01 | 16.16 | 3.44E-03 | 2.86E-04 |
| m | 32 | 968.37 | 4.69E+01 | 26.61 | 3.43E-03 | 2.85E-04 |
| | 33 | 1120.49 | 4.82E+01 | 28.57 | 3.01E-03 | 2.50E-04 |
| | 34 | 1272.39 | 1.92E+01 | 21.34 | 2.70E-03 | 2.31E-04 |
| | 35 | 1377.47 | 1.75E+01 | 17.82 | 2.51E-03 | 2.20E-04 |
| | 36 | 1460.54 | 4.19E+02 | 43.21 | 2.39E-03 | 2.08E-04 |
| | 37 | 1592.53 | 7.17E+00 | 6.71 | 2.20E-03 | 1.88E-04 |
| | 38 | 1629.29 | 1.07E+01 | 8.25 | 2.16E-03 | 1.82E-04 |
| | 39 | 2613.60 | 3.40E+01 | 13.87 | 1.28E-03 | 1.51E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 12:22:01PM

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 46.39 | 1.05E+02 | 83.71 | 2.81E+01 | 8.29E+00 | 7.65E+01 | 8.41E+01 |
| | 2 | 62.50 | 1.44E+02 | 97.53 | 5.67E+01 | 8.57E+00 | 8.72E+01 | 9.79E+01 |
| | 3 | 76.20 | 9.21E+02 | 149.28 | | | 9.21E+02 | 1.49E+02 |
| M | 4 | 83.72 | 7.59E+01 | 54.55 | | | 7.59E+01 | 5.46E+01 |
| m | 5 | 87.62 | 2.52E+02 | 114.51 | | | 2.52E+02 | 1.15E+02 |
| m | 6 | 92.55 | 2.81E+02 | 95.04 | 5.99E+01 | 8.61E+00 | 2.21E+02 | 9.54E+01 |
| | 7 | 130.06 | 5.69E+01 | 62.72 | | | 5.69E+01 | 6.27E+01 |
| M | 8 | 182.37 | 2.95E+01 | 23.73 | | | 2.95E+01 | 2.37E+01 |
| m | 9 | 186.32 | 1.53E+02 | 70.46 | 2.43E+01 | 7.50E+00 | 1.28E+02 | 7.09E+01 |
| | 10 | 209.71 | 8.25E+01 | 62.86 | | | 8.25E+01 | 6.29E+01 |
| M | 11 | 238.75 | 5.18E+02 | 68.60 | 1.06E+01 | 6.01E+00 | 5.07E+02 | 6.89E+01 |
| m | 12 | 241.68 | 1.31E+02 | 69.84 | | | 1.31E+02 | 6.98E+01 |
| | 13 | 271.03 | 5.69E+01 | 45.30 | | | 5.69E+01 | 4.53E+01 |
| | 14 | 295.00 | 2.04E+02 | 62.15 | | | 2.04E+02 | 6.22E+01 |
| | 15 | 300.34 | 3.59E+01 | 32.15 | | | 3.59E+01 | 3.22E+01 |
| | 16 | 339.03 | 8.38E+01 | 57.46 | | | 8.38E+01 | 5.75E+01 |
| | 17 | 351.41 | 2.80E+02 | 74.83 | | | 2.80E+02 | 7.48E+01 |
| | 18 | 408.81 | 3.37E+01 | 39.19 | | | 3.37E+01 | 3.92E+01 |
| | 19 | 462.17 | 2.59E+01 | 32.38 | | | 2.59E+01 | 3.24E+01 |
| | 20 | 511.49 | 1.01E+02 | 44.88 | 4.55E+01 | 4.99E+00 | 5.58E+01 | 4.52E+01 |
| M | 21 | 577.77 | 2.04E+01 | 12.39 | | | 2.04E+01 | 1.24E+01 |
| m | 22 | 583.29 | 1.50E+02 | 34.12 | | | 1.50E+02 | 3.41E+01 |
| | 23 | 609.51 | 1.80E+02 | 48.39 | | | 1.80E+02 | 4.84E+01 |
| | 24 | 626.69 | 2.59E+01 | 30.94 | | | 2.59E+01 | 3.09E+01 |
| | 25 | 661.86 | 6.07E+01 | 40.95 | | | 6.07E+01 | 4.10E+01 |
| | 26 | 728.51 | 3.06E+01 | 26.61 | | | 3.06E+01 | 2.66E+01 |
| | 27 | 768.96 | 2.97E+01 | 35.61 | | | 2.97E+01 | 3.56E+01 |
| | 28 | 859.27 | 2.25E+01 | 26.80 | | | 2.25E+01 | 2.68E+01 |
| | 29 | 911.41 | 8.37E+01 | 34.00 | | | 8.37E+01 | 3.40E+01 |
| | 30 | 954.56 | 2.05E+01 | 22.17 | | | 2.05E+01 | 2.22E+01 |
| M | 31 | 964.61 | 1.74E+01 | 16.16 | | | 1.74E+01 | 1.62E+01 |
| m | 32 | 968.37 | 4.69E+01 | 26.61 | | | 4.69E+01 | 2.66E+01 |
| | 33 | 1120.49 | 4.82E+01 | 28.57 | | | 4.82E+01 | 2.86E+01 |
| | 34 | 1272.39 | 1.92E+01 | 21.34 | | | 1.92E+01 | 2.13E+01 |
| | 35 | 1377.47 | 1.75E+01 | 17.82 | | | 1.75E+01 | 1.78E+01 |
| | 36 | 1460.54 | 4.19E+02 | 43.21 | | | 4.19E+02 | 4.32E+01 |
| | 37 | 1592.53 | 7.17E+00 | 6.71 | | | 7.17E+00 | 6.71E+00 |
| | 38 | 1629.29 | 1.07E+01 | 8.25 | | | 1.07E+01 | 8.25E+00 |
| | 39 | 2613.60 | 3.40E+01 | 13.87 | | | 3.40E+01 | 1.39E+01 |

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

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 12:22:01PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 46.39 | 1.05E+02 | 83.71 | 2.81E+01 | 8.29E+00 | 7.65E+01 | 8.41E+01 |
| | 2 | 62.50 | 1.44E+02 | 97.53 | 5.67E+01 | 8.57E+00 | 8.72E+01 | 9.79E+01 |
| | 3 | 76.20 | 9.21E+02 | 149.28 | | | 9.21E+02 | 1.49E+02 |
| M | 4 | 83.72 | 7.59E+01 | 54.55 | | | 7.59E+01 | 5.46E+01 |
| m | 5 | 87.62 | 2.52E+02 | 114.51 | | | 2.52E+02 | 1.15E+02 |
| m | 6 | 92.55 | 2.81E+02 | 95.04 | 5.99E+01 | 8.61E+00 | 2.21E+02 | 9.54E+01 |
| | 7 | 130.06 | 5.69E+01 | 62.72 | | | 5.69E+01 | 6.27E+01 |
| M | 8 | 182.37 | 2.95E+01 | 23.73 | | | 2.95E+01 | 2.37E+01 |
| m | 9 | 186.32 | 1.53E+02 | 70.46 | 2.43E+01 | 7.50E+00 | 1.28E+02 | 7.09E+01 |
| | 10 | 209.71 | 8.25E+01 | 62.86 | | | 8.25E+01 | 6.29E+01 |
| M | 11 | 238.75 | 5.18E+02 | 68.60 | 1.06E+01 | 6.01E+00 | 5.07E+02 | 6.89E+01 |
| m | 12 | 241.68 | 1.31E+02 | 69.84 | | | 1.31E+02 | 6.98E+01 |
| | 13 | 271.03 | 5.69E+01 | 45.30 | | | 5.69E+01 | 4.53E+01 |
| | 14 | 295.00 | 2.04E+02 | 62.15 | | | 2.04E+02 | 6.22E+01 |
| | 15 | 300.34 | 3.59E+01 | 32.15 | | | 3.59E+01 | 3.22E+01 |
| | 16 | 339.03 | 8.38E+01 | 57.46 | | | 8.38E+01 | 5.75E+01 |
| | 17 | 351.41 | 2.80E+02 | 74.83 | | | 2.80E+02 | 7.48E+01 |
| | 18 | 408.81 | 3.37E+01 | 39.19 | | | 3.37E+01 | 3.92E+01 |
| | 19 | 462.17 | 2.59E+01 | 32.38 | | | 2.59E+01 | 3.24E+01 |
| | 20 | 511.49 | 1.01E+02 | 44.88 | 4.55E+01 | 4.99E+00 | 5.58E+01 | 4.52E+01 |
| M | 21 | 577.77 | 2.04E+01 | 12.39 | | | 2.04E+01 | 1.24E+01 |
| m | 22 | 583.29 | 1.50E+02 | 34.12 | | | 1.50E+02 | 3.41E+01 |
| | 23 | 609.51 | 1.80E+02 | 48.39 | | | 1.80E+02 | 4.84E+01 |
| | 24 | 626.69 | 2.59E+01 | 30.94 | | | 2.59E+01 | 3.09E+01 |
| | 25 | 661.86 | 6.07E+01 | 40.95 | | | 6.07E+01 | 4.10E+01 |
| | 26 | 728.51 | 3.06E+01 | 26.61 | | | 3.06E+01 | 2.66E+01 |
| | 27 | 768.96 | 2.97E+01 | 35.61 | | | 2.97E+01 | 3.56E+01 |
| | 28 | 859.27 | 2.25E+01 | 26.80 | | | 2.25E+01 | 2.68E+01 |
| | 29 | 911.41 | 8.37E+01 | 34.00 | | | 8.37E+01 | 3.40E+01 |
| | 30 | 954.56 | 2.05E+01 | 22.17 | | | 2.05E+01 | 2.22E+01 |
| M | 31 | 964.61 | 1.74E+01 | 16.16 | | | 1.74E+01 | 1.62E+01 |
| m | 32 | 968.37 | 4.69E+01 | 26.61 | | | 4.69E+01 | 2.66E+01 |
| | 33 | 1120.49 | 4.82E+01 | 28.57 | | | 4.82E+01 | 2.86E+01 |
| | 34 | 1272.39 | 1.92E+01 | 21.34 | | | 1.92E+01 | 2.13E+01 |
| | 35 | 1377.47 | 1.75E+01 | 17.82 | | | 1.75E+01 | 1.78E+01 |
| | 36 | 1460.54 | 4.19E+02 | 43.21 | | | 4.19E+02 | 4.32E+01 |
| | 37 | 1592.53 | 7.17E+00 | 6.71 | | | 7.17E+00 | 6.71E+00 |
| | 38 | 1629.29 | 1.07E+01 | 8.25 | | | 1.07E+01 | 8.25E+00 |
| | 39 | 2613.60 | 3.40E+01 | 13.87 | | | 3.40E+01 | 1.39E+01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.989 | 1460.81 | * | 10.67 | 2.06E+01 | 2.81E+00 |
| CD-109 | 0.973 | 88.03 | * | 3.72 | 4.15E+00 | 1.93E+00 |
| SN-126 | 1.000 | 87.57 | * | 37.00 | 3.60E-01 | 1.66E-01 |
| CS-137 | 0.993 | 661.65 | * | 85.12 | 1.84E-01 | 1.26E-01 |
| TL-208 | 0.342 | 583.14 | * | 30.22 | 1.12E+00 | 2.86E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | | 35.85 | | |
| PB-210 | 0.998 | 46.50 | * | 4.25 | 1.38E+00 | 1.52E+00 |
| PB-212 | 0.997 | 238.63 | * | 44.60 | 1.04E+00 | 1.67E-01 |
| | | 300.09 | * | 3.41 | 1.21E+00 | 1.09E+00 |
| BI-214 | 0.711 | 609.31 | * | 46.30 | 9.20E-01 | 2.70E-01 |
| | | 1120.29 | * | 15.10 | 1.32E+00 | 7.91E-01 |
| | | 1764.49 | | 15.80 | | |
| | | 2204.22 | | 4.98 | | |
| PB-214 | 0.971 | 295.21 | * | 19.19 | 1.20E+00 | 3.79E-01 |
| | | 351.92 | * | 37.19 | 1.02E+00 | 2.86E-01 |
| RA-224 | 0.925 | 240.98 | * | 3.95 | 3.07E+00 | 1.66E+00 |
| RA-226 | 0.998 | 186.21 | * | 3.28 | 2.89E+00 | 5.52E+00 |
| AC-228 | 0.949 | 338.32 | * | 11.40 | 9.57E-01 | 6.62E-01 |
| | | 911.07 | * | 27.70 | 1.04E+00 | 4.32E-01 |
| | | 969.11 | * | 16.60 | 1.03E+00 | 5.90E-01 |
| TH-234 | 0.904 | 63.29 | * | 3.80 | 1.34E+00 | 1.51E+00 |

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 12:22:01PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 3 | 76.20 | 2.55842E-01 | 8.10 | | |
| M | 4 | 83.72 | 2.10758E-02 | 35.95 | Tol. | TH-231 |
| m | 6 | 92.55 | 6.15199E-02 | 21.54 | Sum | |
| | 7 | 130.06 | 1.58182E-02 | 55.07 | | |
| M | 8 | 182.37 | 8.19021E-03 | 40.24 | Tol. | LU-172 |
| | 10 | 209.71 | 2.29203E-02 | 38.09 | Tol. | GA-67 |
| | | | | | | CM-243 |
| | 13 | 271.03 | 1.58177E-02 | 39.77 | | |
| | 18 | 408.81 | 9.35529E-03 | 58.18 | | |
| | 19 | 462.17 | 7.20734E-03 | 62.39 | | |
| | 20 | 511.49 | 1.55060E-02 | 40.45 | | |
| M | 21 | 577.77 | 5.66783E-03 | 30.36 | Sum | |
| | 24 | 626.69 | 7.20047E-03 | 59.67 | | |
| | 26 | 728.51 | 8.49026E-03 | 43.53 | | |
| | 27 | 768.96 | 8.25082E-03 | 59.94 | Sum | |
| | 28 | 859.27 | 6.26037E-03 | 59.45 | | |
| | 30 | 954.56 | 5.69444E-03 | 54.07 | | |
| M | 31 | 964.61 | 4.84647E-03 | 46.30 | Tol. | EU-152 |
| | 34 | 1272.39 | 5.33854E-03 | 55.51 | | |
| | 35 | 1377.47 | 4.86111E-03 | 50.91 | | |
| | 37 | 1592.53 | 1.99074E-03 | 46.80 | | |
| | 38 | 1629.29 | 2.95940E-03 | 38.70 | Sum | |
| | 39 | 2613.60 | 9.43714E-03 | 20.42 | | |

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

# *NUCLIDE IDENTIFICATION REPORT*

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.98 | 1460.81 | * | 10.67 | 2.06E+01 | 2.81E+00 |
| CD-109 | 0.97 | 88.03 | * | 3.72 | 4.15E+00 | 1.93E+00 |
| SN-126 | 1.00 | 87.57 | * | 37.00 | 3.60E-01 | 1.66E-01 |
| CS-137 | 0.99 | 661.65 | * | 85.12 | 1.84E-01 | 1.26E-01 |
| TL-208 | 0.34 | 583.14 | * | 30.22 | 1.12E+00 | 2.86E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | | 35.85 | | |
| PB-210 | 0.99 | 46.50 | * | 4.25 | 1.38E+00 | 1.52E+00 |
| PB-212 | 0.99 | 238.63 | * | 44.60 | 1.04E+00 | 1.67E-01 |
| | | 300.09 | * | 3.41 | 1.21E+00 | 1.09E+00 |
| BI-214 | 0.71 | 609.31 | * | 46.30 | 9.20E-01 | 2.70E-01 |
| | | 1120.29 | * | 15.10 | 1.32E+00 | 7.91E-01 |
| | | 1764.49 | | 15.80 | | |
| | | 2204.22 | | 4.98 | | |
| PB-214 | 0.97 | 295.21 | * | 19.19 | 1.20E+00 | 3.79E-01 |
| | | 351.92 | * | 37.19 | 1.02E+00 | 2.86E-01 |
| RA-224 | 0.92 | 240.98 | * | 3.95 | 3.07E+00 | 1.66E+00 |
| RA-226 | 0.99 | 186.21 | * | 3.28 | 2.89E+00 | 5.52E+00 |
| AC-228 | 0.94 | 338.32 | * | 11.40 | 9.57E-01 | 6.62E-01 |
| | | 911.07 | * | 27.70 | 1.04E+00 | 4.32E-01 |
| | | 969.11 | * | 16.60 | 1.03E+00 | 5.90E-01 |
| TH-234 | 0.90 | 63.29 | * | 3.80 | 1.34E+00 | 1.51E+00 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.989 | 2.06E+01 | 2.81E+00 | |
| ? | CD-109 | 0.973 | 4.15E+00 | 1.93E+00 | |
| ? | SN-126 | 1.000 | 3.60E-01 | 1.66E-01 | |
| | CS-137 | 0.993 | 1.84E-01 | 1.26E-01 | |
| | TL-208 | 0.342 | 1.12E+00 | 2.86E-01 | |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| PB-210 | 0.998 | 1.38E+00 | 1.52E+00 | |
| PB-212 | 0.997 | 1.05E+00 | 1.65E-01 | |
| BI-214 | 0.711 | 9.62E-01 | 2.56E-01 | |
| PB-214 | 0.971 | 1.08E+00 | 2.28E-01 | |
| RA-224 | 0.925 | 3.07E+00 | 1.66E+00 | |
| RA-226 | 0.998 | 2.89E+00 | 5.52E+00 | |
| AC-228 | 0.949 | 1.02E+00 | 3.08E-01 | |
| TH-234 | 0.904 | 1.34E+00 | 1.51E+00 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 12:22:01PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 3 | 76.20 | 2.55842E-01 | 8.10 | | |
| M | 4 | 83.72 | 2.10758E-02 | 35.95 | Tol. | TH-231 |
| m | 6 | 92.55 | 6.15199E-02 | 21.54 | Sum | |
| | 7 | 130.06 | 1.58182E-02 | 55.07 | | |
| M | 8 | 182.37 | 8.19021E-03 | 40.24 | Tol. | LU-172 |
| | 10 | 209.71 | 2.29203E-02 | 38.09 | Tol. | GA-67<br>CM-243 |
| | 13 | 271.03 | 1.58177E-02 | 39.77 | | |
| | 18 | 408.81 | 9.35529E-03 | 58.18 | | |
| | 19 | 462.17 | 7.20734E-03 | 62.39 | | |
| | 20 | 511.49 | 1.55060E-02 | 40.45 | | |
| M | 21 | 577.77 | 5.66783E-03 | 30.36 | Sum | |
| | 24 | 626.69 | 7.20047E-03 | 59.67 | | |
| | 26 | 728.51 | 8.49026E-03 | 43.53 | | |
| | 27 | 768.96 | 8.25082E-03 | 59.94 | Sum | |
| | 28 | 859.27 | 6.26037E-03 | 59.45 | | |
| | 30 | 954.56 | 5.69444E-03 | 54.07 | | |
| M | 31 | 964.61 | 4.84647E-03 | 46.30 | Tol. | EU-152 |
| | 34 | 1272.39 | 5.33854E-03 | 55.51 | | |
| | 35 | 1377.47 | 4.86111E-03 | 50.91 | | |
| | 37 | 1592.53 | 1.99074E-03 | 46.80 | | |
| | 38 | 1629.29 | 2.95940E-03 | 38.70 | Sum | |
| | 39 | 2613.60 | 9.43714E-03 | 20.42 | | |

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

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | 4.56E-02 | 3.01E+00 | 3.01E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | -2.16E-02 | 1.67E-01 | 1.67E-01 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | 3.08E-02 | 9.63E-02 | 9.63E-02 |
| + | | K-40 | 1460.81 | * | 10.67 | 2.06E+01 | 1.24E+00 | 1.24E+00 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | 1.90E-02 | 7.76E-02 | 7.76E-02 |
| | | | 78.34 | | 96.00 | 3.45E-01 | | 9.97E-02 |
| + | | SC-46 | 889.25 | | 99.98 | 9.67E-02 | 2.83E-01 | 2.83E-01 |
| | | | 1120.51 | | 99.99 | 4.34E-01 | | 4.09E-01 |
| + | | V-48 | 983.52 | | 99.98 | -6.71E+00 | 9.49E+00 | 9.49E+00 |
| | | | 1312.10 | | 97.50 | 1.64E+00 | | 1.08E+01 |
| + | | CR-51 | 320.08 | | 9.83 | 8.16E-01 | 9.13E+00 | 9.13E+00 |
| + | | MN-54 | 834.83 | | 99.97 | 2.94E-02 | 1.62E-01 | 1.62E-01 |
| + | | CO-56 | 846.75 | | 99.96 | -4.38E-02 | 2.62E-01 | 2.62E-01 |
| | | | 1037.75 | | 14.03 | -1.23E+00 | | 2.00E+00 |
| | | | 1238.25 | | 67.00 | 1.53E-01 | | 6.45E-01 |
| | | | 1771.40 | | 15.51 | -1.43E-01 | | 1.61E+00 |
| | | | 2598.48 | | 16.90 | 1.07E-01 | | 1.48E+00 |
| + | | CO-57 | 122.06 | | 85.51 | -5.31E-02 | 8.69E-02 | 8.69E-02 |
| | | | 136.48 | | 10.60 | -4.07E-01 | | 6.84E-01 |
| + | | CO-58 | 810.76 | | 99.40 | -1.71E-01 | 3.02E-01 | 3.02E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | 2.02E-01 | 1.26E+00 | 1.26E+00 |
| | | | 1291.56 | | 43.20 | 4.00E-01 | | 1.59E+00 |
| + | | CO-60 | 1173.22 | | 100.00 | -1.66E-02 | 1.32E-01 | 1.51E-01 |
| | | | 1332.49 | | 100.00 | 3.78E-03 | | 1.32E-01 |
| + | | ZN-65 | 1115.52 | | 50.75 | 1.53E-02 | 4.11E-01 | 4.11E-01 |
| + | | GA-67 | 93.31 | | 35.70 | 3.06E+08 | 2.95E+08 | 2.95E+08 |
| | | | 208.95 | | 2.24 | 4.59E+09 | | 4.70E+09 |
| | | | 300.22 | | 16.00 | -1.66E+09 | | 6.97E+08 |
| + | | SE-75 | 121.11 | | 16.70 | -4.98E-01 | 1.67E-01 | 6.02E-01 |
| | | | 136.00 | | 59.20 | -5.53E-02 | | 1.67E-01 |
| | | | 264.65 | | 59.80 | -2.86E-02 | | 1.97E-01 |
| | | | 279.53 | | 25.20 | 4.46E-01 | | 5.41E-01 |
| | | | 400.65 | | 11.40 | 2.98E-02 | | 1.17E+00 |
| + | | RB-82 | 776.52 | | 13.00 | -7.60E-01 | 1.35E+01 | 1.35E+01 |
| + | | RB-83 | 520.41 | | 46.00 | 1.42E-01 | 4.38E-01 | 4.38E-01 |
| | | | 529.64 | | 30.30 | -1.28E-01 | | 6.07E-01 |
| | | | 552.65 | | 16.40 | -3.10E-01 | | 1.15E+00 |
| + | | KR-85 | 513.99 | | 0.43 | 1.07E+01 | 2.56E+01 | 2.56E+01 |
| + | | SR-85 | 513.99 | | 99.27 | 1.33E-01 | 3.18E-01 | 3.18E-01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | Y-88 | 898.02 | | 93.40 | 4.43E-02 | 1.63E-01 | 2.56E-01 |
| | | 1836.01 | | 99.38 | -8.30E-03 | | 1.63E-01 |
| + | MO-93 | 263.06 | | 56.72 | 9.65E-03 | 9.84E-02 | 1.22E-01 |
| | | 684.67 | | 99.68 | -1.63E-02 | | 1.13E-01 |
| | | 1477.11 | | 99.08 | -5.59E-03 | | 9.84E-02 |
| + | NB-93M | 16.57 | | 9.43 | 1.60E+01 | 8.24E+00 | 8.24E+00 |
| + | NB-94 | 702.63 | | 100.00 | -3.20E-02 | 1.26E-01 | 1.26E-01 |
| | | 871.10 | | 100.00 | -6.29E-02 | | 1.27E-01 |
| + | NB-95 | 765.79 | | 99.81 | 2.84E-02 | 9.19E-01 | 9.19E-01 |
| + | NB-95M | 235.69 | | 25.00 | 1.61E+08 | 8.41E+07 | 8.41E+07 |
| + | ZR-95 | 724.18 | | 43.70 | -2.40E-01 | 5.83E-01 | 8.05E-01 |
| | | 756.72 | | 55.30 | -2.68E-01 | | 5.83E-01 |
| + | MO-99 | 181.06 | | 6.20 | -7.15E+09 | 6.12E+10 | 7.41E+10 |
| | | 739.58 | | 12.80 | -2.27E+10 | | 6.12E+10 |
| | | 778.00 | | 4.50 | 7.24E+09 | | 1.91E+11 |
| + | RU-103 | 497.08 | | 89.00 | -2.15E-02 | 5.26E-01 | 5.26E-01 |
| + | RU-106 | 621.84 | | 9.80 | 3.95E-02 | 1.19E+00 | 1.19E+00 |
| + | AG-108M | 433.93 | | 89.90 | -1.08E-02 | 8.77E-02 | 8.77E-02 |
| | | 614.37 | | 90.40 | -3.95E-01 | | 1.09E-01 |
| | | 722.95 | | 90.50 | -3.45E-02 | | 1.28E-01 |
| + | CD-109 | 88.03 | * | 3.72 | 4.15E+00 | 4.01E+00 | 4.01E+00 |
| + | AG-110M | 657.75 | | 93.14 | 1.28E-02 | 2.07E-01 | 2.07E-01 |
| | | 677.61 | | 10.53 | -8.36E-02 | | 1.36E+00 |
| | | 706.67 | | 16.46 | -5.28E-02 | | 9.56E-01 |
| | | 763.93 | | 21.98 | 2.24E-02 | | 7.80E-01 |
| | | 884.67 | | 71.63 | -1.15E-01 | | 2.14E-01 |
| | | 1384.27 | | 23.94 | -1.37E-01 | | 5.85E-01 |
| + | CD-113M | 263.70 | | 0.02 | -5.36E+01 | 2.97E+02 | 2.97E+02 |
| + | SN-113 | 255.12 | | 1.93 | -1.13E+00 | 2.22E-01 | 6.15E+00 |
| | | 391.69 | | 64.90 | 5.95E-02 | | 2.22E-01 |
| + | TE123M | 159.00 | | 84.10 | -6.93E-02 | 1.24E-01 | 1.24E-01 |
| + | SB-124 | 602.71 | | 97.87 | 3.63E-02 | 2.91E-01 | 2.91E-01 |
| | | 645.85 | | 7.26 | -4.03E-01 | | 4.12E+00 |
| | | 722.78 | | 11.10 | -8.80E-01 | | 3.26E+00 |
| | | 1691.02 | | 49.00 | 1.15E-01 | | 6.39E-01 |
| + | I-125 | 35.49 | | 6.49 | 4.02E-02 | 5.60E+00 | 5.60E+00 |
| + | SB-125 | 176.33 | | 6.89 | 4.51E-01 | 3.02E-01 | 9.60E-01 |
| | | 427.89 | | 29.33 | 1.84E-02 | | 3.02E-01 |
| | | 463.38 | | 10.35 | 3.61E-01 | | 9.94E-01 |
| | | 600.56 | | 17.80 | 8.01E-02 | | 5.72E-01 |
| | | 635.90 | | 11.32 | 3.32E-01 | | 9.24E-01 |
| + | SB-126 | 414.70 | | 83.30 | 1.78E+00 | 2.50E+01 | 2.50E+01 |
| | | 666.33 | | 99.60 | -1.48E+00 | | 3.29E+01 |
| | | 695.00 | | 99.60 | 6.34E+00 | | 3.46E+01 |
| | | 720.50 | | 53.80 | -3.48E+01 | | 5.26E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 3.60E-01 | 3.48E-01 | 3.48E-01 |
| + | SB-127 | 473.00 | | 25.00 | -6.73E+06 | 1.79E+07 | 1.92E+07 |
| | | 685.20 | | 35.70 | -2.59E+06 | | 1.79E+07 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | | SB-127 | 783.80 | | 14.70 | 2.81E+07 | 1.79E+07 | 4.94E+07 |
| + | | I-129 | 29.78 | | 57.00 | -6.76E-02 | 2.75E-01 | 2.75E-01 |
| | | | 33.60 | | 13.20 | 1.32E-01 | | 9.55E-01 |
| | | | 39.58 | | 7.52 | 4.00E-01 | | 1.31E+00 |
| + | | I-131 | 284.30 | | 6.05 | -9.51E+02 | 4.77E+02 | 6.02E+03 |
| | | | 364.48 | | 81.20 | -2.36E+01 | | 4.77E+02 |
| | | | 636.97 | | 7.26 | 2.62E+03 | | 7.22E+03 |
| | | | 722.89 | | 1.80 | -9.00E+03 | | 3.33E+04 |
| + | | TE-132 | 49.72 | | 13.10 | 1.15E+07 | 1.18E+08 | 9.04E+08 |
| | | | 228.16 | | 88.00 | -6.46E+06 | | 1.18E+08 |
| + | | BA-133 | 81.00 | | 33.00 | -4.95E-01 | 1.61E-01 | 2.32E-01 |
| | | | 302.84 | | 17.80 | -4.82E-03 | | 4.24E-01 |
| | | | 356.01 | | 60.00 | -1.80E-01 | | 1.61E-01 |
| + | @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | XE-133 | 81.00 | | 38.00 | -2.11E+05 | 9.89E+04 | 9.89E+04 |
| + | | CS-134 | 563.23 | | 8.38 | 6.26E-02 | 1.06E-01 | 1.27E+00 |
| | | | 569.32 | | 15.43 | -1.10E-01 | | 6.37E-01 |
| | | | 604.70 | | 97.60 | 0.00E+00 | | 1.06E-01 |
| | | | 795.84 | | 85.40 | 9.86E-02 | | 1.58E-01 |
| | | | 801.93 | | 8.73 | -5.72E-01 | | 1.50E+00 |
| + | | CS-135 | 268.24 | | 16.00 | 7.41E-02 | 4.62E-01 | 4.62E-01 |
| + | @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | | CS-136 | 153.22 | | 7.46 | 6.50E+01 | 2.28E+01 | 1.55E+02 |
| | | | 163.89 | | 4.61 | 1.10E+02 | | 2.47E+02 |
| | | | 176.55 | | 13.56 | -2.04E+01 | | 8.40E+01 |
| | | | 273.65 | | 12.66 | -1.75E+00 | | 1.11E+02 |
| | | | 340.57 | | 48.50 | 3.87E+01 | | 3.53E+01 |
| | | | 818.50 | | 99.70 | -6.74E+00 | | 2.28E+01 |
| | | | 1048.07 | | 79.60 | 9.90E+00 | | 3.40E+01 |
| | | | 1235.34 | | 19.70 | 2.58E+01 | | 1.65E+02 |
| + | | CS-137 | 661.65 | * | 85.12 | 1.84E-01 | 1.97E-01 | 1.97E-01 |
| + | | LA-138 | 788.74 | | 34.00 | 1.84E-02 | 1.84E-01 | 3.50E-01 |
| | | | 1435.80 | | 66.00 | 5.15E-02 | | 1.84E-01 |
| + | | CE-139 | 165.85 | | 80.35 | 1.95E-02 | 1.24E-01 | 1.24E-01 |
| + | | BA-140 | 162.64 | | 6.70 | 2.96E+01 | 7.84E+01 | 1.95E+02 |
| | | | 304.84 | | 4.50 | 5.07E+01 | | 3.30E+02 |
| | | | 423.70 | | 3.20 | -4.00E+02 | | 5.21E+02 |
| | | | 437.55 | | 2.00 | -3.57E+02 | | 8.57E+02 |
| | | | 537.32 | | 25.00 | -4.96E+00 | | 7.84E+01 |
| + | | LA-140 | 328.77 | | 20.50 | 6.02E+01 | 2.43E+01 | 8.58E+01 |
| | | | 487.03 | | 45.50 | -9.99E+00 | | 4.20E+01 |
| | | | 815.85 | | 23.50 | 6.27E+01 | | 1.16E+02 |
| | | | 1596.49 | | 95.49 | -8.59E-02 | | 2.43E+01 |
| + | | CE-141 | 145.44 | | 48.40 | -6.90E-02 | 1.04E+00 | 1.04E+00 |
| + | @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | CE-144 | 133.54 | 10.80 | 1.32E-01 | 6.78E-01 | 6.78E-01 |
| + | PM-144 | 476.78 | 42.00 | -6.78E-02 | 1.22E-01 | 2.43E-01 |
| | | 618.01 | 98.60 | 1.90E-02 | | 1.22E-01 |
| | | 696.49 | 99.49 | 7.67E-02 | | 1.69E-01 |
| + | PM-145 | 36.85 | 21.70 | -8.65E-02 | 2.69E-01 | 5.05E-01 |
| | | 37.36 | 39.70 | -4.62E-02 | | 2.69E-01 |
| | | 42.30 | 15.10 | -3.44E-03 | | 6.07E-01 |
| | | 72.40 | 2.31 | -8.66E+00 | | 3.63E+00 |
| + | PM-146 | 453.90 | 39.94 | -2.46E-02 | 2.28E-01 | 2.28E-01 |
| | | 735.90 | 14.01 | 3.94E-01 | | 8.30E-01 |
| | | 747.13 | 13.10 | 4.87E-01 | | 8.93E-01 |
| + | ND-147 | 91.11 | 28.90 | 2.50E+02 | 1.41E+02 | 1.41E+02 |
| | | 531.02 | 13.10 | -9.40E+01 | | 3.41E+02 |
| + | PM-149 | 285.90 | 3.10 | -1.76E+13 | 7.09E+13 | 7.09E+13 |
| + | EU-152 | 121.78 | 20.50 | -1.74E-01 | 2.85E-01 | 2.85E-01 |
| | | 244.69 | 5.40 | -1.42E+00 | | 1.45E+00 |
| | | 344.27 | 19.13 | -4.04E-01 | | 4.12E-01 |
| | | 778.89 | 9.20 | -3.13E-01 | | 1.29E+00 |
| | | 964.01 | 10.40 | 9.64E-02 | | 1.44E+00 |
| | | 1085.78 | 7.22 | 3.05E-02 | | 1.77E+00 |
| | | 1112.02 | 9.60 | 4.43E-01 | | 1.50E+00 |
| | | 1407.95 | 14.94 | 2.06E-01 | | 8.76E-01 |
| + | GD-153 | 97.43 | 31.30 | 4.05E-02 | 2.60E-01 | 2.60E-01 |
| | | 103.18 | 22.20 | 9.71E-02 | | 3.46E-01 |
| + | EU-154 | 123.07 | 40.50 | 3.04E-02 | 1.49E-01 | 1.49E-01 |
| | | 723.30 | 19.70 | -1.86E-01 | | 6.22E-01 |
| | | 873.19 | 11.50 | 6.23E-01 | | 1.25E+00 |
| | | 996.32 | 10.30 | -1.05E+00 | | 1.27E+00 |
| | | 1004.76 | 17.90 | 1.95E-01 | | 7.50E-01 |
| | | 1274.45 | 35.50 | -5.78E-02 | | 4.48E-01 |
| + | EU-155 | 86.50 | 30.90 | 2.52E-01 | 2.53E-01 | 2.53E-01 |
| | | 105.30 | 20.70 | 1.18E-01 | | 2.86E-01 |
| + | EU-156 | 811.77 | 10.40 | -1.31E+02 | 9.57E+01 | 9.57E+01 |
| | | 1153.47 | 7.20 | -1.92E+01 | | 2.00E+02 |
| | | 1230.71 | 8.90 | -5.02E+01 | | 1.68E+02 |
| + | HO-166M | 184.41 | 72.60 | 1.59E-01 | 1.05E-01 | 1.05E-01 |
| | | 280.45 | 29.60 | 3.13E-02 | | 2.51E-01 |
| | | 410.94 | 11.10 | -8.81E-02 | | 7.84E-01 |
| | | 711.69 | 54.10 | 7.37E-02 | | 2.24E-01 |
| + | TM-171 | 66.72 | 0.14 | 1.42E+01 | 5.87E+01 | 5.87E+01 |
| + | HF-172 | 67.35 | 5.31 | 3.75E-01 | 6.02E-01 | 1.55E+00 |
| | | 125.81 | 11.30 | -6.96E-02 | | 6.02E-01 |
| + | LU-172 | 181.53 | 20.60 | -8.32E+02 | 7.01E+03 | 9.13E+03 |
| | | 900.72 | 29.81 | 6.84E+03 | | 1.26E+04 |
| | | 1093.66 | 62.50 | -1.31E+03 | | 7.01E+03 |
| + | LU-173 | 100.72 | 5.24 | -2.10E-01 | 4.07E-01 | 1.26E+00 |
| | | 272.11 | 21.20 | 7.81E-02 | | 4.07E-01 |
| + | HF-175 | 343.40 | 84.00 | -2.42E-01 | 2.47E-01 | 2.47E-01 |
| + | LU-176 | 88.34 | 13.30 | -8.83E-02 | 7.30E-02 | 5.65E-01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | LU-176 | 201.83 | | 86.00 | -9.04E-03 | 7.30E-02 | 7.90E-02 |
| | | 306.78 | | 94.00 | -3.27E-02 | | 7.30E-02 |
| + | HF-181 | 133.02 | | 41.70 | 1.71E-01 | 5.56E-01 | 7.25E-01 |
| | | 345.85 | | 17.20 | -5.86E+00 | | 2.25E+00 |
| | | 482.03 | | 82.80 | -1.81E-02 | | 5.56E-01 |
| + | TA-182 | 67.75 | | 41.20 | 7.94E-02 | 3.24E-01 | 3.24E-01 |
| | | 1121.30 | | 34.90 | 7.91E-01 | | 9.19E-01 |
| | | 1189.05 | | 16.23 | -8.80E-01 | | 1.85E+00 |
| | | 1221.41 | | 26.98 | -1.74E-02 | | 1.16E+00 |
| | | 1231.02 | | 11.44 | -2.23E+00 | | 2.50E+00 |
| + | IR-192 | 308.46 | | 29.68 | 1.59E-01 | 4.55E-01 | 6.12E-01 |
| | | 468.07 | | 48.10 | 3.61E-02 | | 4.55E-01 |
| + | HG-203 | 279.19 | | 77.30 | 2.98E-01 | 4.33E-01 | 4.33E-01 |
| + | TL-204 | 374.74 | | 94.11 | -5.65E-03 | 8.73E-02 | 8.73E-02 |
| | | 899.15 | | 99.16 | 8.46E-02 | | 1.40E-01 |
| | | 911.74 | | 91.10 | 3.33E-01 | | 2.16E-01 |
| + | BI-207 | 569.67 | | 97.72 | -1.60E-02 | 9.23E-02 | 9.23E-02 |
| | | 1063.62 | | 74.90 | -3.35E-03 | | 1.82E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 1.12E+00 | 5.93E-01 | 5.93E-01 |
| | | 860.37 | | 4.48 | 1.04E+00 | | 2.85E+00 |
| | | 2614.66 | | 35.85 | 5.44E-02 | | 8.74E-01 |
| + | BI-210M | 262.00 | | 45.00 | 9.77E-03 | 1.54E-01 | 1.54E-01 |
| | | 300.00 | | 23.00 | -7.95E-01 | | 3.33E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 1.38E+00 | 2.49E+00 | 2.49E+00 |
| + | PB-211 | 404.84 | | 2.90 | 1.99E-01 | 2.93E+00 | 2.93E+00 |
| | | 831.96 | | 2.90 | -1.02E+00 | | 4.31E+00 |
| + | BI-212 | 727.17 | | 11.80 | -1.19E-01 | 1.11E+00 | 1.11E+00 |
| | | 1620.62 | | 2.75 | 1.25E+00 | | 3.49E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.04E+00 | 3.20E-01 | 3.20E-01 |
| | | 300.09 | * | 3.41 | 1.21E+00 | | 1.75E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 9.20E-01 | 3.52E-01 | 3.52E-01 |
| | | 1120.29 | * | 15.10 | 1.32E+00 | | 1.20E+00 |
| | | 1764.49 | | 15.80 | 4.74E-01 | | 8.87E-01 |
| | | 2204.22 | | 4.98 | 7.92E-01 | | 2.87E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 1.20E+00 | 4.10E-01 | 5.51E-01 |
| | | 351.92 | * | 37.19 | 1.02E+00 | | 4.10E-01 |
| + | RN-219 | 401.80 | | 6.50 | 7.46E-02 | 1.16E+00 | 1.16E+00 |
| + | RA-223 | 323.87 | | 3.88 | -6.38E-01 | 1.95E+00 | 1.95E+00 |
| + | RA-224 | 240.98 | * | 3.95 | 3.07E+00 | 3.64E+00 | 3.64E+00 |
| + | RA-225 | 40.00 | | 31.00 | 9.97E+00 | 3.28E+01 | 3.28E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.89E+00 | 2.94E+00 | 2.94E+00 |
| + | TH-227 | 50.10 | | 8.40 | 1.20E-02 | 9.46E-01 | 9.46E-01 |
| | | 236.00 | | 11.50 | 1.85E+00 | | 9.69E-01 |
| | | 256.20 | | 6.30 | -1.09E-01 | | 1.06E+00 |
| + | AC-228 | 338.32 | * | 11.40 | 9.57E-01 | 6.21E-01 | 1.05E+00 |
| | | 911.07 | * | 27.70 | 1.04E+00 | | 6.21E-01 |
| | | 969.11 | * | 16.60 | 1.03E+00 | | 1.13E+00 |
| + | TH-230 | 48.44 | | 16.90 | 2.62E-01 | 4.99E-01 | 4.99E-01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | TH-230 | 62.85 | | 4.60 | 1.40E+00 | 4.99E-01 | 1.71E+00 |
| | | 67.67 | | 0.37 | 4.85E+00 | | 1.98E+01 |
| + | PA-231 | 283.67 | | 1.60 | -6.90E-01 | 3.22E+00 | 4.36E+00 |
| | | 302.67 | | 2.30 | -3.66E-02 | | 3.22E+00 |
| + | TH-231 | 25.64 | | 14.70 | -5.85E-01 | 1.08E+00 | 1.51E+00 |
| | | 84.21 | | 6.40 | -1.05E+00 | | 1.08E+00 |
| + | PA-233 | 311.98 | | 38.60 | 1.02E-01 | 2.36E+00 | 2.36E+00 |
| + | PA-234 | 131.20 | | 20.40 | 2.92E-02 | 3.00E-01 | 3.00E-01 |
| | | 733.99 | | 8.80 | -4.97E-01 | | 1.26E+00 |
| | | 946.00 | | 12.00 | -1.30E-01 | | 1.02E+00 |
| + | PA-234M | 1001.03 | | 0.92 | 2.04E-01 | 1.45E+01 | 1.45E+01 |
| + | TH-234 | 63.29 | * | 3.80 | 1.34E+00 | 2.47E+00 | 2.47E+00 |
| + | U-235 | 143.76 | | 10.50 | 2.47E-01 | 5.82E-01 | 5.82E-01 |
| | | 163.35 | | 4.70 | 1.95E-01 | | 1.28E+00 |
| | | 205.31 | | 4.70 | -1.13E-01 | | 1.45E+00 |
| + | NP-237 | 86.50 | | 12.60 | 5.96E-01 | 5.97E-01 | 5.97E-01 |
| + | NP-239 | 106.10 | | 22.70 | -2.48E+11 | 1.19E+12 | 1.19E+12 |
| | | 228.18 | | 10.70 | -1.75E+11 | | 3.20E+12 |
| | | 277.60 | | 14.10 | 6.06E+11 | | 2.61E+12 |
| + | AM-241 | 59.54 | | 35.90 | -1.66E-02 | 2.17E-01 | 2.17E-01 |
| + | AM-243 | 74.67 | | 66.00 | 6.37E-01 | 1.52E-01 | 1.52E-01 |
| + | CM-243 | 209.75 | | 3.29 | 1.56E+00 | 5.44E-01 | 2.19E+00 |
| | | 228.14 | | 10.60 | -3.65E-02 | | 6.68E-01 |
| | | 277.60 | | 14.00 | 1.26E-01 | | 5.44E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 3.01E+00 | 3.01E+00 | 4.56E-02 | 1.42E+00 |
| | NA-22 | 1274.54 | | 99.94 | 1.67E-01 | 1.67E-01 | -2.16E-02 | 7.69E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 9.63E-02 | 9.63E-02 | 3.08E-02 | 3.95E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.24E+00 | 1.24E+00 | 2.06E+01 | 5.55E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 7.76E-02 | 7.76E-02 | 1.90E-02 | 3.80E-02 |
| | | 78.34 | | 96.00 | 9.97E-02 | | 3.45E-01 | 4.91E-02 |
| | SC-46 | 889.25 | | 99.98 | 2.83E-01 | 2.83E-01 | 9.67E-02 | 1.31E-01 |
| | | 1120.51 | | 99.99 | 4.09E-01 | | 4.34E-01 | 1.92E-01 |
| | V-48 | 983.52 | | 99.98 | 9.49E+00 | 9.49E+00 | -6.71E+00 | 4.37E+00 |
| | | 1312.10 | | 97.50 | 1.08E+01 | | 1.64E+00 | 4.91E+00 |
| | CR-51 | 320.08 | | 9.83 | 9.13E+00 | 9.13E+00 | 8.16E-01 | 4.36E+00 |
| | MN-54 | 834.83 | | 99.97 | 1.62E-01 | 1.62E-01 | 2.94E-02 | 7.56E-02 |
| | CO-56 | 846.75 | | 99.96 | 2.62E-01 | 2.62E-01 | -4.38E-02 | 1.21E-01 |
| | | 1037.75 | | 14.03 | 2.00E+00 | | -1.23E+00 | 9.09E-01 |
| | | 1238.25 | | 67.00 | 6.45E-01 | | 1.53E-01 | 3.01E-01 |
| | | 1771.40 | | 15.51 | 1.61E+00 | | -1.43E-01 | 6.75E-01 |
| | | 2598.48 | | 16.90 | 1.48E+00 | | 1.07E-01 | 5.52E-01 |
| | CO-57 | 122.06 | | 85.51 | 8.69E-02 | 8.69E-02 | -5.31E-02 | 4.23E-02 |
| | | 136.48 | | 10.60 | 6.84E-01 | | -4.07E-01 | 3.32E-01 |
| | CO-58 | 810.76 | | 99.40 | 3.02E-01 | 3.02E-01 | -1.71E-01 | 1.40E-01 |
| | FE-59 | 1099.22 | | 56.50 | 1.26E+00 | 1.26E+00 | 2.02E-01 | 5.86E-01 |
| | | 1291.56 | | 43.20 | 1.59E+00 | | 4.00E-01 | 7.27E-01 |
| | CO-60 | 1173.22 | | 100.00 | 1.51E-01 | 1.32E-01 | -1.66E-02 | 6.97E-02 |
| | | 1332.49 | | 100.00 | 1.32E-01 | | 3.78E-03 | 5.93E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 4.11E-01 | 4.11E-01 | 1.53E-02 | 1.91E-01 |
| | GA-67 | 93.31 | | 35.70 | 2.95E+08 | 2.95E+08 | 3.06E+08 | 1.44E+08 |
| | | 208.95 | | 2.24 | 4.70E+09 | | 4.59E+09 | 2.28E+09 |
| | | 300.22 | | 16.00 | 6.97E+08 | | -1.66E+09 | 3.34E+08 |
| | SE-75 | 121.11 | | 16.70 | 6.02E-01 | 1.67E-01 | -4.98E-01 | 2.93E-01 |
| | | 136.00 | | 59.20 | 1.67E-01 | | -5.53E-02 | 8.10E-02 |
| | | 264.65 | | 59.80 | 1.97E-01 | | -2.86E-02 | 9.43E-02 |
| | | 279.53 | | 25.20 | 5.41E-01 | | 4.46E-01 | 2.60E-01 |
| | | 400.65 | | 11.40 | 1.17E+00 | | 2.98E-02 | 5.53E-01 |
| | RB-82 | 776.52 | | 13.00 | 1.35E+01 | 1.35E+01 | -7.60E-01 | 6.30E+00 |
| | RB-83 | 520.41 | | 46.00 | 4.38E-01 | 4.38E-01 | 1.42E-01 | 2.06E-01 |
| | | 529.64 | | 30.30 | 6.07E-01 | | -1.28E-01 | 2.83E-01 |
| | | 552.65 | | 16.40 | 1.15E+00 | | -3.10E-01 | 5.37E-01 |
| | KR-85 | 513.99 | | 0.43 | 2.56E+01 | 2.56E+01 | 1.07E+01 | 1.22E+01 |
| | SR-85 | 513.99 | | 99.27 | 3.18E-01 | 3.18E-01 | 1.33E-01 | 1.51E-01 |
| | Y-88 | 898.02 | | 93.40 | 2.56E-01 | 1.63E-01 | 4.43E-02 | 1.19E-01 |
| | | 1836.01 | | 99.38 | 1.63E-01 | | -8.30E-03 | 6.48E-02 |
| | MO-93 | 263.06 | | 56.72 | 1.22E-01 | 9.84E-02 | 9.65E-03 | 5.88E-02 |
| | | 684.67 | | 99.68 | 1.13E-01 | | -1.63E-02 | 5.30E-02 |
| | | 1477.11 | | 99.08 | 9.84E-02 | | -5.59E-03 | 4.19E-02 |
| | NB-93M | 16.57 | | 9.43 | 8.24E+00 | 8.24E+00 | 1.60E+01 | 4.00E+00 |
| | NB-94 | 702.63 | | 100.00 | 1.26E-01 | 1.26E-01 | -3.20E-02 | 5.96E-02 |
| | | 871.10 | | 100.00 | 1.27E-01 | | -6.29E-02 | 5.92E-02 |
| | NB-95 | 765.79 | | 99.81 | 9.19E-01 | 9.19E-01 | 2.84E-02 | 4.31E-01 |
| | NB-95M | 235.69 | | 25.00 | 8.41E+07 | 8.41E+07 | 1.61E+08 | 4.11E+07 |
| | ZR-95 | 724.18 | | 43.70 | 8.05E-01 | 5.83E-01 | -2.40E-01 | 3.77E-01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | ZR-95 | 756.72 | | 55.30 | 5.83E-01 | 5.83E-01 | -2.68E-01 | 2.71E-01 |
| | MO-99 | 181.06 | | 6.20 | 7.41E+10 | 6.12E+10 | -7.15E+09 | 3.59E+10 |
| | | 739.58 | | 12.80 | 6.12E+10 | | -2.27E+10 | 2.84E+10 |
| | | 778.00 | | 4.50 | 1.91E+11 | | 7.24E+09 | 8.91E+10 |
| | RU-103 | 497.08 | | 89.00 | 5.26E-01 | 5.26E-01 | -2.15E-02 | 2.46E-01 |
| | RU-106 | 621.84 | | 9.80 | 1.19E+00 | 1.19E+00 | 3.95E-02 | 5.57E-01 |
| | AG-108M | 433.93 | | 89.90 | 8.77E-02 | 8.77E-02 | -1.08E-02 | 4.13E-02 |
| | | 614.37 | | 90.40 | 1.09E-01 | | -3.95E-01 | 5.11E-02 |
| | | 722.95 | | 90.50 | 1.28E-01 | | -3.45E-02 | 5.96E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 4.01E+00 | 4.01E+00 | 4.15E+00 | 1.98E+00 |
| | AG-110M | 657.75 | | 93.14 | 2.07E-01 | 2.07E-01 | 1.28E-02 | 9.85E-02 |
| | | 677.61 | | 10.53 | 1.36E+00 | | -8.36E-02 | 6.34E-01 |
| | | 706.67 | | 16.46 | 9.56E-01 | | -5.28E-02 | 4.49E-01 |
| | | 763.93 | | 21.98 | 7.80E-01 | | 2.24E-02 | 3.66E-01 |
| | | 884.67 | | 71.63 | 2.14E-01 | | -1.15E-01 | 9.85E-02 |
| | | 1384.27 | | 23.94 | 5.85E-01 | | -1.37E-01 | 2.55E-01 |
| | CD-113M | 263.70 | | 0.02 | 2.97E+02 | 2.97E+02 | -5.36E+01 | 1.42E+02 |
| | SN-113 | 255.12 | | 1.93 | 6.15E+00 | 2.22E-01 | -1.13E+00 | 2.95E+00 |
| | | 391.69 | | 64.90 | 2.22E-01 | | 5.95E-02 | 1.05E-01 |
| | TE123M | 159.00 | | 84.10 | 1.24E-01 | 1.24E-01 | -6.93E-02 | 6.01E-02 |
| | SB-124 | 602.71 | | 97.87 | 2.91E-01 | 2.91E-01 | 3.63E-02 | 1.35E-01 |
| | | 645.85 | | 7.26 | 4.12E+00 | | -4.03E-01 | 1.92E+00 |
| | | 722.78 | | 11.10 | 3.26E+00 | | -8.80E-01 | 1.52E+00 |
| | | 1691.02 | | 49.00 | 6.39E-01 | | 1.15E-01 | 2.68E-01 |
| | I-125 | 35.49 | | 6.49 | 5.60E+00 | 5.60E+00 | 4.02E-02 | 2.73E+00 |
| | SB-125 | 176.33 | | 6.89 | 9.60E-01 | 3.02E-01 | 4.51E-01 | 4.65E-01 |
| | | 427.89 | | 29.33 | 3.02E-01 | | 1.84E-02 | 1.43E-01 |
| | | 463.38 | | 10.35 | 9.94E-01 | | 3.61E-01 | 4.72E-01 |
| | | 600.56 | | 17.80 | 5.72E-01 | | 8.01E-02 | 2.67E-01 |
| | | 635.90 | | 11.32 | 9.24E-01 | | 3.32E-01 | 4.31E-01 |
| | SB-126 | 414.70 | | 83.30 | 2.50E+01 | 2.50E+01 | 1.78E+00 | 1.18E+01 |
| | | 666.33 | | 99.60 | 3.29E+01 | | -1.48E+00 | 1.56E+01 |
| | | 695.00 | | 99.60 | 3.46E+01 | | 6.34E+00 | 1.63E+01 |
| | | 720.50 | | 53.80 | 5.26E+01 | | -3.48E+01 | 2.45E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 3.48E-01 | 3.48E-01 | 3.60E-01 | 1.72E-01 |
| | SB-127 | 473.00 | | 25.00 | 1.92E+07 | 1.79E+07 | -6.73E+06 | 9.03E+06 |
| | | 685.20 | | 35.70 | 1.79E+07 | | -2.59E+06 | 8.39E+06 |
| | | 783.80 | | 14.70 | 4.94E+07 | | 2.81E+07 | 2.31E+07 |
| | I-129 | 29.78 | | 57.00 | 2.75E-01 | 2.75E-01 | -6.76E-02 | 1.33E-01 |
| | | 33.60 | | 13.20 | 9.55E-01 | | 1.32E-01 | 4.64E-01 |
| | | 39.58 | | 7.52 | 1.31E+00 | | 4.00E-01 | 6.40E-01 |
| | I-131 | 284.30 | | 6.05 | 6.02E+03 | 4.77E+02 | -9.51E+02 | 2.88E+03 |
| | | 364.48 | | 81.20 | 4.77E+02 | | -2.36E+01 | 2.26E+02 |
| | | 636.97 | | 7.26 | 7.22E+03 | | 2.62E+03 | 3.37E+03 |
| | | 722.89 | | 1.80 | 3.33E+04 | | -9.00E+03 | 1.56E+04 |
| | TE-132 | 49.72 | | 13.10 | 9.04E+08 | 1.18E+08 | 1.15E+07 | 4.41E+08 |
| | | 228.16 | | 88.00 | 1.18E+08 | | -6.46E+06 | 5.71E+07 |
| | BA-133 | 81.00 | | 33.00 | 2.32E-01 | 1.61E-01 | -4.95E-01 | 1.14E-01 |
| | | 302.84 | | 17.80 | 4.24E-01 | | -4.82E-03 | 2.03E-01 |
| | | 356.01 | | 60.00 | 1.61E-01 | | -1.80E-01 | 7.74E-02 |
| @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | XE-133 | 81.00 | | 38.00 | 9.89E+04 | 9.89E+04 | -2.11E+05 | 4.85E+04 |
| | CS-134 | 563.23 | | 8.38 | 1.27E+00 | 1.06E-01 | 6.26E-02 | 5.96E-01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | CS-134 | 569.32 | | 15.43 | 6.37E-01 | 1.06E-01 | -1.10E-01 | 2.97E-01 |
| | | 604.70 | | 97.60 | 1.06E-01 | | 0.00E+00 | 4.94E-02 |
| | | 795.84 | | 85.40 | 1.58E-01 | | 9.86E-02 | 7.39E-02 |
| | | 801.93 | | 8.73 | 1.50E+00 | | -5.72E-01 | 7.00E-01 |
| | CS-135 | 268.24 | | 16.00 | 4.62E-01 | 4.62E-01 | 7.41E-02 | 2.22E-01 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CS-136 | 153.22 | | 7.46 | 1.55E+02 | 2.28E+01 | 6.50E+01 | 7.56E+01 |
| | | 163.89 | | 4.61 | 2.47E+02 | | 1.10E+02 | 1.20E+02 |
| | | 176.55 | | 13.56 | 8.40E+01 | | -2.04E+01 | 4.07E+01 |
| | | 273.65 | | 12.66 | 1.11E+02 | | -1.75E+00 | 5.34E+01 |
| | | 340.57 | | 48.50 | 3.53E+01 | | 3.87E+01 | 1.70E+01 |
| | | 818.50 | | 99.70 | 2.28E+01 | | -6.74E+00 | 1.06E+01 |
| | | 1048.07 | | 79.60 | 3.40E+01 | | 9.90E+00 | 1.58E+01 |
| | | 1235.34 | | 19.70 | 1.65E+02 | | 2.58E+01 | 7.69E+01 |
| + | CS-137 | 661.65 | * | 85.12 | 1.97E-01 | 1.97E-01 | 1.84E-01 | 9.44E-02 |
| | LA-138 | 788.74 | | 34.00 | 3.50E-01 | 1.84E-01 | 1.84E-02 | 1.63E-01 |
| | | 1435.80 | | 66.00 | 1.84E-01 | | 5.15E-02 | 8.12E-02 |
| | CE-139 | 165.85 | | 80.35 | 1.24E-01 | 1.24E-01 | 1.95E-02 | 6.02E-02 |
| | BA-140 | 162.64 | | 6.70 | 1.95E+02 | 7.84E+01 | 2.96E+01 | 9.44E+01 |
| | | 304.84 | | 4.50 | 3.30E+02 | | 5.07E+01 | 1.57E+02 |
| | | 423.70 | | 3.20 | 5.21E+02 | | -4.00E+02 | 2.45E+02 |
| | | 437.55 | | 2.00 | 8.57E+02 | | -3.57E+02 | 4.04E+02 |
| | | 537.32 | | 25.00 | 7.84E+01 | | -4.96E+00 | 3.68E+01 |
| | LA-140 | 328.77 | | 20.50 | 8.58E+01 | 2.43E+01 | 6.02E+01 | 4.11E+01 |
| | | 487.03 | | 45.50 | 4.20E+01 | | -9.99E+00 | 1.98E+01 |
| | | 815.85 | | 23.50 | 1.16E+02 | | 6.27E+01 | 5.40E+01 |
| | | 1596.49 | | 95.49 | 2.43E+01 | | -8.59E-02 | 1.04E+01 |
| | CE-141 | 145.44 | | 48.40 | 1.04E+00 | 1.04E+00 | -6.90E-02 | 5.06E-01 |
| @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-144 | 133.54 | | 10.80 | 6.78E-01 | 6.78E-01 | 1.32E-01 | 3.30E-01 |
| | PM-144 | 476.78 | | 42.00 | 2.43E-01 | 1.22E-01 | -6.78E-02 | 1.14E-01 |
| | | 618.01 | | 98.60 | 1.22E-01 | | 1.90E-02 | 5.72E-02 |
| | | 696.49 | | 99.49 | 1.69E-01 | | 7.67E-02 | 8.01E-02 |
| | PM-145 | 36.85 | | 21.70 | 5.05E-01 | 2.69E-01 | -8.65E-02 | 2.46E-01 |
| | | 37.36 | | 39.70 | 2.69E-01 | | -4.62E-02 | 1.31E-01 |
| | | 42.30 | | 15.10 | 6.07E-01 | | -3.44E-03 | 2.96E-01 |
| | | 72.40 | | 2.31 | 3.63E+00 | | -8.66E+00 | 1.78E+00 |
| | PM-146 | 453.90 | | 39.94 | 2.28E-01 | 2.28E-01 | -2.46E-02 | 1.08E-01 |
| | | 735.90 | | 14.01 | 8.30E-01 | | 3.94E-01 | 3.87E-01 |
| | | 747.13 | | 13.10 | 8.93E-01 | | 4.87E-01 | 4.16E-01 |
| | ND-147 | 91.11 | | 28.90 | 1.41E+02 | 1.41E+02 | 2.50E+02 | 6.91E+01 |
| | | 531.02 | | 13.10 | 3.41E+02 | | -9.40E+01 | 1.59E+02 |
| | PM-149 | 285.90 | | 3.10 | 7,09E+13 | 7.09E+13 | -1.76E+13 | 3.39E+13 |
| | EU-152 | 121.78 | | 20.50 | 2.85E-01 | 2.85E-01 | -1.74E-01 | 1.39E-01 |
| | | 244.69 | | 5.40 | 1.45E+00 | | -1.42E+00 | 7.01E-01 |
| | | 344.27 | | 19.13 | 4.12E-01 | | -4.04E-01 | 1.96E-01 |
| | | 778.89 | | 9.20 | 1.29E+00 | | -3.13E-01 | 5.99E-01 |
| | | 964.01 | | 10.40 | 1.44E+00 | | 9.64E-02 | 6.73E-01 |
| | | 1085.78 | | 7.22 | 1.77E+00 | | 3.05E-02 | 8.11E-01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | EU-152 | 1112.02 | | 9.60 | 1.50E+00 | 2.85E-01 | 4.43E-01 | 6.93E-01 |
| | | 1407.95 | | 14.94 | 8.76E-01 | | 2.06E-01 | 3.92E-01 |
| | GD-153 | 97.43 | | 31.30 | 2.60E-01 | 2.60E-01 | 4.05E-02 | 1.27E-01 |
| | | 103.18 | | 22.20 | 3.46E-01 | | 9.71E-02 | 1.69E-01 |
| | EU-154 | 123.07 | | 40.50 | 1.49E-01 | 1.49E-01 | 3.04E-02 | 7.26E-02 |
| | | 723.30 | | 19.70 | 6.22E-01 | | -1.86E-01 | 2.91E-01 |
| | | 873.19 | | 11.50 | 1.25E+00 | | 6.23E-01 | 5.86E-01 |
| | | 996.32 | | 10.30 | 1.27E+00 | | -1.05E+00 | 5.84E-01 |
| | | 1004.76 | | 17.90 | 7.50E-01 | | 1.95E-01 | 3.46E-01 |
| | | 1274.45 | | 35.50 | 4.48E-01 | | -5.78E-02 | 2.06E-01 |
| | EU-155 | 86.50 | | 30.90 | 2.53E-01 | 2.53E-01 | 2.52E-01 | 1.24E-01 |
| | | 105.30 | | 20.70 | 2.86E-01 | | 1.18E-01 | 1.39E-01 |
| | EU-156 | 811.77 | | 10.40 | 9.57E+01 | 9.57E+01 | -1.31E+02 | 4.41E+01 |
| | | 1153.47 | | 7.20 | 2.00E+02 | | -1.92E+01 | 9.26E+01 |
| | | 1230.71 | | 8.90 | 1.68E+02 | | -5.02E+01 | 7.77E+01 |
| | HO-166M | 184.41 | | 72.60 | 1.05E-01 | 1.05E-01 | 1.59E-01 | 5.11E-02 |
| | | 280.45 | | 29.60 | 2.51E-01 | | 3.13E-02 | 1.21E-01 |
| | | 410.94 | | 11.10 | 7.84E-01 | | -8.81E-02 | 3.72E-01 |
| | | 711.69 | | 54.10 | 2.24E-01 | | 7.37E-02 | 1.05E-01 |
| | TM-171 | 66.72 | | 0.14 | 5.87E+01 | 5.87E+01 | 1.42E+01 | 2.88E+01 |
| | HF-172 | 67.35 | | 5.31 | 1.55E+00 | 6.02E-01 | 3.75E-01 | 7.57E-01 |
| | | 125.81 | | 11.30 | 6.02E-01 | | -6.96E-02 | 2.94E-01 |
| | LU-172 | 181.53 | | 20.60 | 9.13E+03 | 7.01E+03 | -8.32E+02 | 4.43E+03 |
| | | 900.72 | | 29.81 | 1.26E+04 | | 6.84E+03 | 5.84E+03 |
| | | 1093.66 | | 62.50 | 7.01E+03 | | -1.31E+03 | 3.25E+03 |
| | LU-173 | 100.72 | | 5.24 | 1.26E+00 | 4.07E-01 | -2.10E-01 | 6.15E-01 |
| | | 272.11 | | 21.20 | 4.07E-01 | | 7.81E-02 | 1.96E-01 |
| | HF-175 | 343.40 | | 84.00 | 2.47E-01 | 2.47E-01 | -2.42E-01 | 1.18E-01 |
| | LU-176 | 88.34 | | 13.30 | 5.65E-01 | 7.30E-02 | -8.83E-02 | 2.77E-01 |
| | | 201.83 | | 86.00 | 7.90E-02 | | -9.04E-03 | 3.82E-02 |
| | | 306.78 | | 94.00 | 7.30E-02 | | -3.27E-02 | 3.48E-02 |
| | HF-181 | 133.02 | | 41.70 | 7.25E-01 | 5.56E-01 | 1.71E-01 | 3.53E-01 |
| | | 345.85 | | 17.20 | 2.25E+00 | | -5.86E+00 | 1.07E+00 |
| | | 482.03 | | 82.80 | 5.56E-01 | | -1.81E-02 | 2.63E-01 |
| | TA-182 | 67.75 | | 41.20 | 3.24E-01 | 3.24E-01 | 7.94E-02 | 1.59E-01 |
| | | 1121.30 | | 34.90 | 9.19E-01 | | 7.91E-01 | 4.30E-01 |
| | | 1189.05 | | 16.23 | 1.85E+00 | | -8.80E-01 | 8.61E-01 |
| | | 1221.41 | | 26.98 | 1.16E+00 | | -1.74E-02 | 5.39E-01 |
| | | 1231.02 | | 11.44 | 2.50E+00 | | -2.23E+00 | 1.16E+00 |
| | IR-192 | 308.46 | | 29.68 | 6.12E-01 | 4.55E-01 | 1.59E-01 | 2.92E-01 |
| | | 468.07 | | 48.10 | 4.55E-01 | | 3.61E-02 | 2.15E-01 |
| | HG-203 | 279.19 | | 77.30 | 4.33E-01 | 4.33E-01 | 2.98E-01 | 2.08E-01 |
| | TL-204 | 374.74 | | 94.11 | 8.73E-02 | 8.73E-02 | -5.65E-03 | 4.15E-02 |
| | | 899.15 | | 99.16 | 1.40E-01 | | 8.46E-02 | 6.51E-02 |
| | | 911.74 | | 91.10 | 2.16E-01 | | 3.33E-01 | 1.03E-01 |
| | BI-207 | 569.67 | | 97.72 | 9.23E-02 | 9.23E-02 | -1.60E-02 | 4.31E-02 |
| | | 1063.62 | | 74.90 | 1.82E-01 | | -3.35E-03 | 8.38E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 5.93E-01 | 5.93E-01 | 1.12E+00 | 2.86E-01 |
| | | 860.37 | | 4.48 | 2.85E+00 | | 1.04E+00 | 1.33E+00 |
| | | 2614.66 | | 35.85 | 8.74E-01 | | 5.44E-02 | 4.00E-01 |
| | BI-210M | 262.00 | | 45.00 | 1.54E-01 | 1.54E-01 | 9.77E-03 | 7.40E-02 |
| | | 300.00 | | 23.00 | 3.33E-01 | | -7.95E-01 | 1.60E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 2.49E+00 | 2.49E+00 | 1.38E+00 | 1.22E+00 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | PB-211 | 404.84 | | 2.90 | 2.93E+00 | 2.93E+00 | 1.99E-01 | 1.39E+00 |
| | | 831.96 | | 2.90 | 4.31E+00 | | -1.02E+00 | 2.01E+00 |
| | BI-212 | 727.17 | | 11.80 | 1.11E+00 | 1.11E+00 | -1.19E-01 | 5.21E-01 |
| | | 1620.62 | | 2.75 | 3.49E+00 | | 1.25E+00 | 1.46E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 3.20E-01 | 3.20E-01 | 1.04E+00 | 1.57E-01 |
| | | 300.09 | * | 3.41 | 1.75E+00 | | 1.21E+00 | 8.28E-01 |
| + | BI-214 | 609.31 | * | 46.30 | 3.52E-01 | 3.52E-01 | 9.20E-01 | 1.69E-01 |
| | | 1120.29 | * | 15.10 | 1.20E+00 | | 1.32E+00 | 5.63E-01 |
| | | 1764.49 | | 15.80 | 8.87E-01 | | 4.74E-01 | 3.90E-01 |
| | | 2204.22 | | 4.98 | 2.87E+00 | | 7.92E-01 | 1.22E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 5.51E-01 | 4.10E-01 | 1.20E+00 | 2.67E-01 |
| | | 351.92 | * | 37.19 | 4.10E-01 | | 1.02E+00 | 2.00E-01 |
| | RN-219 | 401.80 | | 6.50 | 1.16E+00 | 1.16E+00 | 7.46E-02 | 5.50E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.95E+00 | 1.95E+00 | -6.38E-01 | 9.34E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 3.64E+00 | 3.64E+00 | 3.07E+00 | 1.79E+00 |
| | RA-225 | 40.00 | | 31.00 | 3.28E+01 | 3.28E+01 | 9.97E+00 | 1.60E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.94E+00 | 2.94E+00 | 2.89E+00 | 1.44E+00 |
| | TH-227 | 50.10 | | 8.40 | 9.46E-01 | 9.46E-01 | 1.20E-02 | 4.62E-01 |
| | | 236.00 | | 11.50 | 9.69E-01 | | 1.85E+00 | 4.74E-01 |
| | | 256.20 | | 6.30 | 1.06E+00 | | -1.09E-01 | 5.08E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.05E+00 | 6.21E-01 | 9.57E-01 | 5.12E-01 |
| | | 911.07 | * | 27.70 | 6.21E-01 | | 1.04E+00 | 2.93E-01 |
| | | 969.11 | * | 16.60 | 1.13E+00 | | 1.03E+00 | 5.34E-01 |
| | TH-230 | 48.44 | | 16.90 | 4.99E-01 | 4.99E-01 | 2.62E-01 | 2.44E-01 |
| | | 62.85 | | 4.60 | 1.71E+00 | | 1.40E+00 | 8.38E-01 |
| | | 67.67 | | 0.37 | 1.98E+01 | | 4.85E+00 | 9.68E+00 |
| | PA-231 | 283.67 | | 1.60 | 4.36E+00 | 3.22E+00 | -6.90E-01 | 2.09E+00 |
| | | 302.67 | | 2.30 | 3.22E+00 | | -3.66E-02 | 1.54E+00 |
| | TH-231 | 25.64 | | 14.70 | 1.51E+00 | 1.08E+00 | -5.85E-01 | 7.32E-01 |
| | | 84.21 | | 6.40 | 1.08E+00 | | -1.05E+00 | 5.31E-01 |
| | PA-233 | 311.98 | | 38.60 | 2.36E+00 | 2.36E+00 | 1.02E-01 | 1.12E+00 |
| | PA-234 | 131.20 | | 20.40 | 3.00E-01 | 3.00E-01 | 2.92E-02 | 1.46E-01 |
| | | 733.99 | | 8.80 | 1.26E+00 | | -4.97E-01 | 5.89E-01 |
| | | 946.00 | | 12.00 | 1.02E+00 | | -1.30E-01 | 4.69E-01 |
| | PA-234M | 1001.03 | | 0.92 | 1.45E+01 | 1.45E+01 | 2.04E-01 | 6.70E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 2.47E+00 | 2.47E+00 | 1.34E+00 | 1.21E+00 |
| | U-235 | 143.76 | | 10.50 | 5.82E-01 | 5.82E-01 | 2.47E-01 | 2.83E-01 |
| | | 163.35 | | 4.70 | 1.28E+00 | | 1.95E-01 | 6.23E-01 |
| | | 205.31 | | 4.70 | 1.45E+00 | | -1.13E-01 | 7.02E-01 |
| | NP-237 | 86.50 | | 12.60 | 5.97E-01 | 5.97E-01 | 5.96E-01 | 2.93E-01 |
| | NP-239 | 106.10 | | 22.70 | 1.19E+12 | 1.19E+12 | -2.48E+11 | 5.81E+11 |
| | | 228.18 | | 10.70 | 3.20E+12 | | -1.75E+11 | 1.55E+12 |
| | | 277.60 | | 14.10 | 2.61E+12 | | 6.06E+11 | 1.25E+12 |
| | AM-241 | 59.54 | | 35.90 | 2.17E-01 | 2.17E-01 | -1.66E-02 | 1.06E-01 |
| | AM-243 | 74.67 | | 66.00 | 1.52E-01 | 1.52E-01 | 6.37E-01 | 7.50E-02 |
| | CM-243 | 209.75 | | 3.29 | 2.19E+00 | 5.44E-01 | 1.56E+00 | 1.06E+00 |
| | | 228.14 | | 10.60 | 6.68E-01 | | -3.65E-02 | 3.23E-01 |
| | | 277.60 | | 14.00 | 5.44E-01 | | 1.26E-01 | 2.61E-01 |

Analysis Report for 1707087-15

HTC-A03-S003-0006-01

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S003-0006-01

Elapsed Live time: 3600
Elapsed Real Time: 3624

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 95 |
| 17: | 101 | 75 | 79 | 67 | 72 | 58 | 56 | 71 |
| 25: | 61 | 57 | 74 | 41 | 62 | 62 | 62 | 62 |
| 33: | 62 | 61 | 61 | 75 | 69 | 70 | 60 | 77 |
| 41: | 68 | 62 | 72 | 82 | 112 | 103 | 93 | 64 |
| 49: | 68 | 76 | 85 | 81 | 83 | 92 | 84 | 98 |
| 57: | 82 | 83 | 111 | 99 | 121 | 145 | 133 | 109 |
| 65: | 93 | 113 | 113 | 118 | 97 | 114 | 111 | 142 |
| 73: | 181 | 271 | 265 | 321 | 262 | 130 | 102 | 83 |
| 81: | 90 | 100 | 126 | 103 | 106 | 157 | 153 | 123 |
| 89: | 138 | 125 | 116 | 180 | 124 | 82 | 70 | 82 |
| 97: | 68 | 86 | 76 | 68 | 76 | 64 | 76 | 67 |
| 105: | 85 | 59 | 66 | 51 | 66 | 71 | 53 | 78 |
| 113: | 58 | 60 | 68 | 84 | 63 | 53 | 65 | 61 |
| 121: | 73 | 61 | 67 | 76 | 73 | 76 | 65 | 90 |
| 129: | 83 | 62 | 72 | 49 | 60 | 55 | 70 | 48 |
| 137: | 52 | 47 | 56 | 65 | 66 | 53 | 61 | 69 |
| 145: | 57 | 62 | 66 | 52 | 56 | 59 | 56 | 52 |
| 153: | 80 | 59 | 52 | 52 | 46 | 47 | 53 | 48 |
| 161: | 50 | 47 | 48 | 51 | 58 | 60 | 41 | 44 |
| 169: | 58 | 36 | 50 | 52 | 47 | 41 | 46 | 53 |
| 177: | 48 | 45 | 44 | 37 | 59 | 51 | 49 | 70 |
| 185: | 93 | 98 | 55 | 50 | 49 | 49 | 48 | 39 |
| 193: | 47 | 36 | 55 | 49 | 56 | 44 | 54 | 46 |
| 201: | 40 | 52 | 44 | 41 | 46 | 41 | 50 | 55 |
| 209: | 58 | 58 | 37 | 35 | 30 | 41 | 47 | 37 |
| 217: | 45 | 40 | 52 | 43 | 37 | 36 | 45 | 45 |
| 225: | 34 | 45 | 42 | 34 | 48 | 27 | 32 | 47 |
| 233: | 40 | 35 | 40 | 64 | 179 | 259 | 147 | 85 |
| 241: | 90 | 56 | 36 | 24 | 24 | 26 | 35 | 28 |
| 249: | 21 | 25 | 26 | 23 | 24 | 25 | 29 | 35 |
| 257: | 27 | 33 | 34 | 30 | 21 | 24 | 27 | 34 |
| 265: | 25 | 28 | 22 | 28 | 40 | 44 | 31 | 35 |
| 273: | 22 | 23 | 30 | 36 | 32 | 30 | 31 | 34 |
| 281: | 26 | 31 | 20 | 21 | 28 | 15 | 24 | 24 |
| 289: | 22 | 27 | 32 | 35 | 42 | 89 | 97 | 39 |
| 297: | 15 | 24 | 38 | 34 | 25 | 14 | 26 | 17 |
| 305: | 19 | 18 | 25 | 19 | 19 | 29 | 26 | 17 |
| 313: | 20 | 19 | 22 | 19 | 29 | 16 | 29 | 20 |
| 321: | 25 | 19 | 25 | 20 | 17 | 31 | 31 | 24 |
| 329: | 17 | 28 | 27 | 14 | 17 | 20 | 15 | 23 |
| 337: | 51 | 47 | 28 | 31 | 22 | 13 | 18 | 14 |
| 345: | 24 | 23 | 23 | 23 | 31 | 78 | 130 | 84 |
| 353: | 28 | 17 | 17 | 20 | 18 | 21 | 11 | 19 |
| 361: | 20 | 26 | 9 | 16 | 11 | 16 | 19 | 17 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 20 | 21 | 19 | 18 | 19 | 12 | 18 | 14 |

Sample Title: HTC-A03-S003-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 22 | 17 | 15 | 25 | 15 | 11 | 9 | 17 |
| 385: | 16 | 23 | 15 | 15 | 18 | 22 | 12 | 18 |
| 393: | 17 | 12 | 14 | 8 | 13 | 13 | 13 | 11 |
| 401: | 13 | 13 | 21 | 14 | 18 | 23 | 21 | 26 |
| 409: | 19 | 22 | 5 | 19 | 13 | 24 | 17 | 14 |
| 417: | 14 | 14 | 22 | 13 | 9 | 16 | 12 | 14 |
| 425: | 10 | 16 | 18 | 18 | 13 | 14 | 14 | 15 |
| 433: | 17 | 11 | 5 | 14 | 13 | 12 | 21 | 13 |
| 441: | 18 | 12 | 13 | 14 | 17 | 12 | 13 | 17 |
| 449: | 17 | 17 | 14 | 17 | 19 | 12 | 13 | 11 |
| 457: | 12 | 17 | 7 | 19 | 21 | 30 | 13 | 11 |
| 465: | 11 | 14 | 14 | 17 | 14 | 12 | 17 | 13 |
| 473: | 9 | 8 | 11 | 18 | 9 | 14 | 16 | 13 |
| 481: | 13 | 15 | 14 | 12 | 15 | 14 | 12 | 12 |
| 489: | 10 | 13 | 16 | 11 | 11 | 5 | 14 | 9 |
| 497: | 7 | 12 | 14 | 12 | 4 | 7 | 13 | 10 |
| 505: | 14 | 15 | 12 | 18 | 31 | 35 | 34 | 18 |
| 513: | 11 | 10 | 12 | 5 | 6 | 16 | 14 | 12 |
| 521: | 13 | 9 | 12 | 9 | 12 | 8 | 6 | 7 |
| 529: | 13 | 9 | 14 | 8 | 11 | 10 | 15 | 10 |
| 537: | 10 | 10 | 9 | 12 | 11 | 14 | 13 | 16 |
| 545: | 14 | 10 | 14 | 10 | 12 | 6 | 9 | 14 |
| 553: | 4 | 10 | 8 | 8 | 11 | 10 | 10 | 14 |
| 561: | 15 | 16 | 9 | 9 | 7 | 11 | 12 | 5 |
| 569: | 13 | 12 | 6 | 7 | 13 | 11 | 2 | 7 |
| 577: | 13 | 6 | 9 | 15 | 27 | 45 | 62 | 25 |
| 585: | 14 | 5 | 5 | 6 | 10 | 14 | 15 | 9 |
| 593: | 6 | 0 | 13 | 10 | 11 | 10 | 7 | 15 |
| 601: | 9 | 12 | 3 | 7 | 7 | 8 | 19 | 59 |
| 609: | 70 | 50 | 12 | 11 | 8 | 9 | 10 | 9 |
| 617: | 10 | 9 | 13 | 10 | 6 | 11 | 7 | 9 |
| 625: | 8 | 19 | 7 | 10 | 4 | 5 | 3 | 5 |
| 633: | 12 | 6 | 9 | 14 | 6 | 11 | 9 | 10 |
| 641: | 10 | 5 | 7 | 15 | 10 | 11 | 5 | 5 |
| 649: | 8 | 8 | 11 | 10 | 13 | 6 | 12 | 10 |
| 657: | 7 | 5 | 13 | 26 | 46 | 20 | 16 | 9 |
| 665: | 11 | 8 | 7 | 11 | 5 | 14 | 10 | 8 |
| 673: | 4 | 6 | 11 | 6 | 10 | 12 | 3 | 5 |
| 681: | 12 | 6 | 8 | 4 | 5 | 12 | 13 | 6 |
| 689: | 6 | 13 | 7 | 9 | 12 | 18 | 11 | 15 |
| 697: | 8 | 10 | 12 | 16 | 11 | 8 | 8 | 8 |
| 705: | 8 | 8 | 8 | 14 | 7 | 9 | 3 | 7 |
| 713: | 12 | 11 | 8 | 4 | 9 | 7 | 6 | 1 |
| 721: | 13 | 6 | 8 | 9 | 12 | 7 | 13 | 13 |
| 729: | 10 | 11 | 2 | 6 | 4 | 10 | 8 | 3 |
| 737: | 8 | 6 | 16 | 3 | 5 | 3 | 5 | 10 |
| 745: | 7 | 7 | 5 | 8 | 8 | 9 | 7 | 3 |
| 753: | 7 | 6 | 8 | 6 | 9 | 4 | 7 | 7 |
| 761: | 11 | 6 | 7 | 9 | 7 | 13 | 13 | 8 |
| 769: | 4 | 7 | 10 | 8 | 9 | 6 | 5 | 11 |
| 777: | 4 | 9 | 4 | 8 | 7 | 7 | 5 | 12 |
| 785: | 11 | 9 | 8 | 3 | 5 | 3 | 6 | 5 |
| 793: | 6 | 8 | 12 | 8 | 7 | 5 | 9 | 4 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 6 | 6 | 6 | 8 | 10 | 11 | 3 | 2 |

Sample Title: HTC-A03-S003-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 4 | 2 | 10 | 8 | 7 | 6 | 5 | 10 |
| 817: | 11 | 6 | 2 | 6 | 6 | 9 | 11 | 6 |
| 825: | 4 | 6 | 7 | 5 | 6 | 4 | 10 | 6 |
| 833: | 11 | 8 | 5 | 10 | 11 | 2 | 6 | 9 |
| 841: | 4 | 9 | 1 | 4 | 7 | 7 | 5 | 3 |
| 849: | 3 | 6 | 6 | 4 | 7 | 3 | 8 | 6 |
| 857: | 5 | 7 | 15 | 10 | 6 | 4 | 3 | 5 |
| 865: | 5 | 5 | 5 | 6 | 7 | 7 | 9 | 7 |
| 873: | 4 | 9 | 9 | 15 | 6 | 4 | 8 | 5 |
| 881: | 6 | 3 | 3 | 5 | 5 | 11 | 1 | 8 |
| 889: | 9 | 8 | 6 | 2 | 4 | 3 | 7 | 8 |
| 897: | 5 | 8 | 7 | 4 | 8 | 7 | 6 | 5 |
| 905: | 4 | 3 | 4 | 4 | 15 | 33 | 37 | 12 |
| 913: | 7 | 5 | 6 | 2 | 8 | 2 | 4 | 9 |
| 921: | 8 | 2 | 5 | 5 | 5 | 2 | 6 | 6 |
| 929: | 6 | 6 | 5 | 3 | 9 | 4 | 5 | 5 |
| 937: | 6 | 7 | 7 | 7 | 4 | 7 | 7 | 6 |
| 945: | 5 | 6 | 4 | 3 | 4 | 6 | 3 | 3 |
| 953: | 10 | 8 | 8 | 10 | 0 | 7 | 3 | 8 |
| 961: | 3 | 6 | 4 | 12 | 9 | 9 | 13 | 23 |
| 969: | 12 | 8 | 11 | 2 | 7 | 5 | 6 | 2 |
| 977: | 8 | 10 | 2 | 7 | 4 | 4 | 7 | 6 |
| 985: | 10 | 2 | 5 | 4 | 10 | 5 | 6 | 6 |
| 993: | 8 | 5 | 6 | 4 | 6 | 2 | 6 | 3 |
| 1001: | 11 | 9 | 8 | 1 | 6 | 5 | 5 | 0 |
| 1009: | 4 | 5 | 8 | 4 | 4 | 4 | 3 | 5 |
| 1017: | 3 | 6 | 4 | 9 | 4 | 2 | 4 | 5 |
| 1025: | 3 | 2 | 2 | 3 | 1 | 8 | 4 | 3 |
| 1033: | 5 | 4 | 3 | 3 | 4 | 3 | 3 | 5 |
| 1041: | 5 | 9 | 7 | 4 | 6 | 4 | 7 | 7 |
| 1049: | 6 | 3 | 11 | 2 | 4 | 5 | 7 | 6 |
| 1057: | 7 | 5 | 3 | 4 | 6 | 8 | 5 | 6 |
| 1065: | 5 | 4 | 5 | 4 | 5 | 4 | 3 | 6 |
| 1073: | 8 | 3 | 5 | 4 | 6 | 3 | 1 | 5 |
| 1081: | 3 | 2 | 5 | 2 | 3 | 4 | 5 | 9 |
| 1089: | 5 | 3 | 8 | 8 | 10 | 5 | 6 | 6 |
| 1097: | 5 | 6 | 8 | 10 | 4 | 4 | 7 | 5 |
| 1105: | 3 | 1 | 6 | 5 | 5 | 6 | 6 | 6 |
| 1113: | 4 | 3 | 6 | 5 | 3 | 7 | 18 | 14 |
| 1121: | 9 | 9 | 6 | 6 | 1 | 5 | 2 | 4 |
| 1129: | 2 | 6 | 6 | 6 | 7 | 4 | 6 | 5 |
| 1137: | 4 | 7 | 10 | 10 | 6 | 5 | 4 | 6 |
| 1145: | 4 | 3 | 9 | 9 | 7 | 2 | 7 | 6 |
| 1153: | 6 | 7 | 6 | 6 | 6 | 6 | 7 | 4 |
| 1161: | 6 | 10 | 11 | 3 | 4 | 4 | 8 | 6 |
| 1169: | 6 | 8 | 5 | 2 | 5 | 5 | 5 | 4 |
| 1177: | 5 | 3 | 3 | 9 | 10 | 3 | 8 | 7 |
| 1185: | 5 | 4 | 5 | 6 | 8 | 5 | 8 | 8 |
| 1193: | 8 | 15 | 9 | 8 | 6 | 9 | 7 | 3 |
| 1201: | 8 | 6 | 4 | 5 | 8 | 5 | 7 | 10 |
| 1209: | 5 | 7 | 8 | 4 | 7 | 8 | 4 | 9 |
| 1217: | 9 | 7 | 5 | 7 | 5 | 6 | 8 | 4 |
| 1225: | 8 | 9 | 5 | 5 | 4 | 7 | 4 | 5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 7 | 5 | 6 | 4 | 11 | 16 | 2 | 5 |

Sample Title: HTC-A03-S003-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 7 | 8 | 7 | 6 | 7 | 5 | 3 | 4 |
| 1249: | 5 | 2 | 2 | 2 | 6 | 7 | 0 | 3 |
| 1257: | 5 | 2 | 3 | 7 | 2 | 4 | 6 | 5 |
| 1265: | 0 | 5 | 3 | 5 | 4 | 4 | 8 | 11 |
| 1273: | 4 | 7 | 2 | 3 | 2 | 3 | 2 | 3 |
| 1281: | 7 | 5 | 2 | 2 | 6 | 5 | 2 | 4 |
| 1289: | 4 | 2 | 5 | 6 | 4 | 7 | 4 | 1 |
| 1297: | 5 | 1 | 7 | 1 | 1 | 3 | 4 | 1 |
| 1305: | 4 | 6 | 3 | 1 | 3 | 5 | 5 | 2 |
| 1313: | 8 | 5 | 2 | 3 | 1 | 3 | 3 | 2 |
| 1321: | 1 | 4 | 3 | 3 | 6 | 1 | 4 | 0 |
| 1329: | 1 | 6 | 4 | 4 | 4 | 1 | 2 | 4 |
| 1337: | 1 | 4 | 1 | 2 | 2 | 1 | 1 | 1 |
| 1345: | 1 | 2 | 3 | 1 | 3 | 5 | 3 | 1 |
| 1353: | 4 | 3 | 0 | 0 | 3 | 2 | 4 | 5 |
| 1361: | 3 | 4 | 2 | 7 | 2 | 1 | 2 | 3 |
| 1369: | 2 | 2 | 1 | 2 | 2 | 0 | 4 | 3 |
| 1377: | 11 | 3 | 2 | 4 | 2 | 1 | 2 | 3 |
| 1385: | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 3 |
| 1393: | 1 | 2 | 3 | 1 | 2 | 2 | 5 | 1 |
| 1401: | 2 | 2 | 2 | 1 | 4 | 3 | 7 | 1 |
| 1409: | 4 | 1 | 2 | 1 | 4 | 0 | 2 | 3 |
| 1417: | 3 | 1 | 3 | 3 | 1 | 2 | 2 | 2 |
| 1425: | 0 | 0 | 4 | 3 | 1 | 2 | 0 | 1 |
| 1433: | 3 | 5 | 1 | 4 | 3 | 0 | 3 | 1 |
| 1441: | 2 | 0 | 1 | 5 | 0 | 1 | 2 | 0 |
| 1449: | 1 | 4 | 2 | 0 | 2 | 2 | 3 | 1 |
| 1457: | 7 | 28 | 82 | 132 | 114 | 43 | 13 | 1 |
| 1465: | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 3 |
| 1473: | 0 | 2 | 0 | 2 | 2 | 2 | 0 | 1 |
| 1481: | 2 | 1 | 1 | 3 | 5 | 1 | 0 | 2 |
| 1489: | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 1 |
| 1497: | 0 | 2 | 0 | 1 | 1 | 3 | 1 | 2 |
| 1505: | 1 | 0 | 1 | 2 | 0 | 3 | 2 | 1 |
| 1513: | 1 | 3 | 1 | 2 | 1 | 1 | 1 | 3 |
| 1521: | 0 | 2 | 1 | 2 | 2 | 1 | 0 | 0 |
| 1529: | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 2 |
| 1537: | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 2 |
| 1545: | 3 | 1 | 0 | 4 | 0 | 2 | 2 | 1 |
| 1553: | 0 | 2 | 1 | 0 | 2 | 0 | 0 | 0 |
| 1561: | 2 | 1 | 0 | 0 | 1 | 1 | 2 | 2 |
| 1569: | 2 | 1 | 0 | 0 | 2 | 0 | 3 | 0 |
| 1577: | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 0 |
| 1585: | 4 | 2 | 1 | 3 | 0 | 0 | 2 | 3 |
| 1593: | 3 | 1 | 0 | 1 | 0 | 0 | 3 | 1 |
| 1601: | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1609: | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 1617: | 0 | 1 | 1 | 2 | 1 | 1 | 0 | 2 |
| 1625: | 0 | 0 | 2 | 1 | 7 | 0 | 1 | 1 |
| 1633: | 1 | 0 | 1 | 3 | 2 | 2 | 1 | 0 |
| 1641: | 1 | 1 | 2 | 1 | 4 | 0 | 2 | 0 |
| 1649: | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 2 |
| 1657: | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |

Sample Title: HTC-A03-S003-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1681: | 0 | 1 | 0 | 1 | 0 | 1 | 2 | 0 |
| 1689: | 0 | 2 | 1 | 0 | 2 | 2 | 0 | 2 |
| 1697: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1705: | 0 | 3 | 1 | 1 | 2 | 3 | 0 | 1 |
| 1713: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 1721: | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 2 |
| 1729: | 2 | 2 | 2 | 1 | 0 | 1 | 0 | 2 |
| 1737: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 |
| 1745: | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 |
| 1753: | 1 | 0 | 3 | 2 | 1 | 0 | 1 | 1 |
| 1761: | 0 | 3 | 9 | 3 | 0 | 0 | 1 | 1 |
| 1769: | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0 |
| 1777: | 3 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 1785: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1793: | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 |
| 1801: | 1 | 1 | 0 | 2 | 1 | 0 | 0 | 1 |
| 1809: | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1817: | 0 | 0 | 0 | 3 | 1 | 2 | 1 | 1 |
| 1825: | 1 | 1 | 1 | 1 | 0 | 4 | 1 | 0 |
| 1833: | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 0 |
| 1841: | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 1 |
| 1849: | 1 | 1 | 2 | 0 | 0 | 0 | 1 | 1 |
| 1857: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 1865: | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 |
| 1873: | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1881: | 2 | 0 | 1 | 1 | 0 | 3 | 0 | 1 |
| 1889: | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| 1897: | 0 | 0 | 1 | 2 | 0 | 0 | 2 | 1 |
| 1905: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 1913: | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 1 |
| 1921: | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 |
| 1929: | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 2 |
| 1937: | 1 | 1 | 1 | 0 | 1 | 2 | 0 | 0 |
| 1945: | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1953: | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 3 |
| 1961: | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 1969: | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 1977: | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 1985: | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| 1993: | 0 | 1 | 1 | 0 | 2 | 1 | 0 | 0 |
| 2001: | 0 | 0 | 1 | 2 | 1 | 0 | 2 | 2 |
| 2009: | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 1 |
| 2017: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 |
| 2025: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| 2033: | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2041: | 0 | 1 | 1 | 2 | 0 | 1 | 1 | 0 |
| 2049: | 1 | 0 | 0 | 3 | 0 | 0 | 1 | 1 |
| 2057: | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2065: | 0 | 0 | 2 | 0 | 2 | 2 | 0 | 1 |
| 2073: | 2 | 0 | 1 | 3 | 1 | 2 | 0 | 0 |
| 2081: | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 1 |
| 2089: | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 0 | 0 | 1 | 2 | 2 | 1 | 3 | 0 |

Sample Title: HTC-A03-S003-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 2 | 1 | 0 | 0 | 2 | 0 | 1 | 1 |
| 2113: | 1 | 1 | 0 | 1 | 2 | 1 | 2 | 1 |
| 2121: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 2129: | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 2 |
| 2137: | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 2 |
| 2145: | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2153: | 0 | 2 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2161: | 0 | 1 | 3 | 0 | 0 | 1 | 1 | 0 |
| 2169: | 1 | 0 | 2 | 0 | 1 | 0 | 2 | 0 |
| 2177: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2185: | 1 | 0 | 1 | 0 | 2 | 0 | 3 | 0 |
| 2193: | 0 | 1 | 0 | 2 | 1 | 0 | 1 | 0 |
| 2201: | 2 | 2 | 1 | 1 | 4 | 1 | 0 | 0 |
| 2209: | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 |
| 2217: | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2225: | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 |
| 2233: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2241: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2249: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 2257: | 0 | 1 | 0 | 0 | 5 | 3 | 0 | 0 |
| 2265: | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2273: | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 0 |
| 2281: | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |
| 2289: | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 3 |
| 2297: | 1 | 1 | 0 | 1 | 0 | 2 | 2 | 1 |
| 2305: | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 |
| 2313: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2321: | 1 | 0 | 2 | 0 | 0 | 1 | 1 | 1 |
| 2329: | 1 | 2 | 0 | 1 | 0 | 1 | 2 | 0 |
| 2337: | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 |
| 2345: | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2353: | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 0 |
| 2361: | 1 | 1 | 0 | 1 | 2 | 1 | 2 | 0 |
| 2369: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2377: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2385: | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 2393: | 1 | 0 | 1 | 0 | 1 | 0 | 3 | 0 |
| 2401: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2409: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2417: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 2425: | 1 | 2 | 0 | 0 | 1 | 2 | 2 | 0 |
| 2433: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2441: | 0 | 2 | 0 | 0 | 1 | 2 | 0 | 0 |
| 2449: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2457: | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 |
| 2465: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2473: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |
| 2481: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2489: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2497: | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2505: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2513: | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2521: | 0 | 1 | 2 | 2 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2545: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2553: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2561: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2569: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2577: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2585: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2593: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 2601: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2609: | 0 | 0 | 2 | 4 | 6 | 11 | 11 | 4 |
| 2617: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2633: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2649: | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2665: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 2673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2705: | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2721: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2737: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| 2745: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2753: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2761: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2769: | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2801: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2809: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2825: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2833: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2841: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2889: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2905: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 2913: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2921: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2929: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2977: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2985: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2993: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3001: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3009: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3017: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3033: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 3057: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3065: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3081: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3161: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3193: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3201: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3209: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3233: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 1 |
| 3289: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3305: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3353: | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| 3361: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3369: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-0006-01

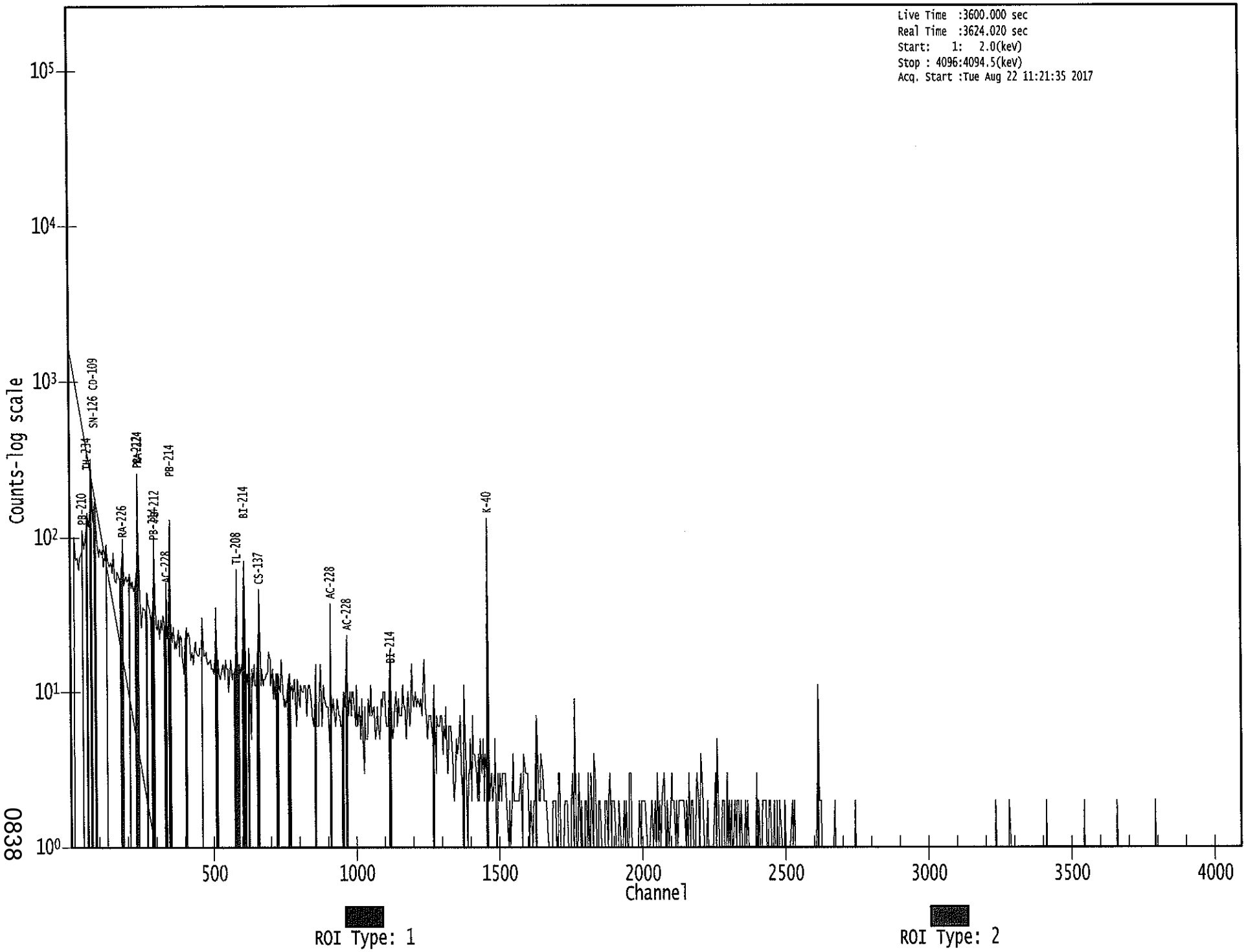
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3409: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 3417: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3505: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3545: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3577: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-0006-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3937: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

# 0000055716.CNF




0838

Apex-Gamma

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-16 |
| Sample Description | : HTC-A03-S003-0612-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.737E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:46:28AM |
| Acquisition Started | : 8/22/2017 12:08:17PM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE1 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.4 seconds |
| Dead Time | : 0.04 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 18 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55717 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 1:08:24PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 43.52 | 44.14 | 0.0000 | 0.00 |
| 2 | 46.52 | 47.15 | 0.0000 | 0.00 |
| 3 | 63.26 | 63.86 | 0.0000 | 0.00 |
| 4 | 74.56 | 75.15 | 0.0000 | 0.00 |
| 5 | 77.26 | 77.85 | 0.0000 | 0.00 |
| 6 | 87.57 | 88.15 | 0.0000 | 0.00 |
| 7 | 92.27 | 92.85 | 0.0000 | 0.00 |
| 8 | 99.81 | 100.37 | 0.0000 | 0.00 |
| 9 | 185.97 | 186.45 | 0.0000 | 0.00 |
| 10 | 209.39 | 209.84 | 0.0000 | 0.00 |
| 11 | 238.54 | 238.97 | 0.0000 | 0.00 |
| 12 | 241.74 | 242.17 | 0.0000 | 0.00 |
| 13 | 269.80 | 270.20 | 0.0000 | 0.00 |
| 14 | 295.25 | 295.62 | 0.0000 | 0.00 |
| 15 | 328.00 | 328.33 | 0.0000 | 0.00 |
| 16 | 338.17 | 338.49 | 0.0000 | 0.00 |
| 17 | 351.79 | 352.11 | 0.0000 | 0.00 |
| 18 | 415.44 | 415.68 | 0.0000 | 0.00 |
| 19 | 462.92 | 463.12 | 0.0000 | 0.00 |
| 20 | 466.18 | 466.37 | 0.0000 | 0.00 |
| 21 | 478.87 | 479.06 | 0.0000 | 0.00 |
| 22 | 511.29 | 511.44 | 0.0000 | 0.00 |
| 23 | 583.26 | 583.34 | 0.0000 | 0.00 |
| 24 | 598.49 | 598.55 | 0.0000 | 0.00 |
| 25 | 609.60 | 609.66 | 0.0000 | 0.00 |
| 26 | 661.86 | 661.86 | 0.0000 | 0.00 |
| 27 | 727.46 | 727.40 | 0.0000 | 0.00 |
| 28 | 769.70 | 769.59 | 0.0000 | 0.00 |
| 29 | 795.19 | 795.05 | 0.0000 | 0.00 |
| 30 | 803.14 | 803.00 | 0.0000 | 0.00 |
| 31 | 806.56 | 806.41 | 0.0000 | 0.00 |
| 32 | 825.01 | 824.85 | 0.0000 | 0.00 |
| 33 | 833.43 | 833.25 | 0.0000 | 0.00 |
| 34 | 841.33 | 841.15 | 0.0000 | 0.00 |
| 35 | 860.69 | 860.49 | 0.0000 | 0.00 |
| 36 | 892.45 | 892.22 | 0.0000 | 0.00 |
| 37 | 911.57 | 911.31 | 0.0000 | 0.00 |
| 38 | 965.10 | 964.80 | 0.0000 | 0.00 |
| 39 | 969.35 | 969.04 | 0.0000 | 0.00 |
| 40 | 983.15 | 982.82 | 0.0000 | 0.00 |
| 41 | 1059.15 | 1058.75 | 0.0000 | 0.00 |
| 42 | 1064.68 | 1064.28 | 0.0000 | 0.00 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1121.08 | 1120.62 | 0.0000 | 0.00 |
| 44 | 1164.74 | 1164.24 | 0.0000 | 0.00 |
| 45 | 1281.63 | 1281.02 | 0.0000 | 0.00 |
| 46 | 1377.68 | 1376.96 | 0.0000 | 0.00 |
| 47 | 1402.74 | 1402.00 | 0.0000 | 0.00 |
| 48 | 1407.75 | 1407.01 | 0.0000 | 0.00 |
| 49 | 1445.39 | 1444.61 | 0.0000 | 0.00 |
| 50 | 1461.37 | 1460.57 | 0.0000 | 0.00 |
| 51 | 1466.02 | 1465.22 | 0.0000 | 0.00 |
| 52 | 1473.96 | 1473.15 | 0.0000 | 0.00 |
| 53 | 1505.81 | 1504.97 | 0.0000 | 0.00 |
| 54 | 1543.94 | 1543.07 | 0.0000 | 0.00 |
| 55 | 1702.20 | 1701.16 | 0.0000 | 0.00 |
| 56 | 1765.05 | 1763.96 | 0.0000 | 0.00 |
| 57 | 1838.29 | 1837.13 | 0.0000 | 0.00 |
| 58 | 1881.09 | 1879.89 | 0.0000 | 0.00 |
| 59 | 1884.97 | 1883.76 | 0.0000 | 0.00 |
| 60 | 1889.73 | 1888.52 | 0.0000 | 0.00 |
| 61 | 1925.58 | 1924.33 | 0.0000 | 0.00 |
| 62 | 1945.47 | 1944.20 | 0.0000 | 0.00 |
| 63 | 1963.00 | 1961.71 | 0.0000 | 0.00 |
| 64 | 1971.86 | 1970.57 | 0.0000 | 0.00 |
| 65 | 2101.92 | 2100.50 | 0.0000 | 0.00 |
| 66 | 2105.42 | 2104.00 | 0.0000 | 0.00 |
| 67 | 2203.99 | 2202.48 | 0.0000 | 0.00 |
| 68 | 2265.18 | 2263.60 | 0.0000 | 0.00 |
| 69 | 2313.11 | 2311.49 | 0.0000 | 0.00 |
| 70 | 2338.38 | 2336.74 | 0.0000 | 0.00 |
| 71 | 2370.82 | 2369.14 | 0.0000 | 0.00 |
| 72 | 2615.12 | 2613.21 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 1:08:24PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| M | 1 | 43.52 | 43 - | 52 | 44.14 | 3.84E+01 | 31.51 | 2.86E+02 | 1.49 |
| m | 2 | 46.52 | 43 - | 52 | 47.15 | 1.30E+02 | 64.68 | 8.12E+02 | 1.60 |
| | 3 | 63.26 | 61 - | 66 | 63.86 | 1.81E+02 | 91.93 | 1.54E+03 | 1.24 |
| M | 4 | 74.56 | 71 - | 81 | 75.15 | 3.71E+02 | 93.07 | 1.38E+03 | 1.65 |
| m | 5 | 77.26 | 71 - | 81 | 77.85 | 6.09E+02 | 99.93 | 1.33E+03 | 1.65 |
| m | 6 | 87.57 | 83 - | 96 | 88.15 | 1.99E+02 | 77.63 | 1.13E+03 | 1.67 |
| m | 7 | 92.27 | 83 - | 96 | 92.85 | 3.06E+02 | 81.97 | 1.05E+03 | 1.67 |
| | 8 | 99.81 | 98 - | 103 | 100.37 | 7.73E+01 | 73.61 | 1.01E+03 | 1.48 |
| | 9 | 185.97 | 182 - | 191 | 186.45 | 2.46E+02 | 95.28 | 1.16E+03 | 2.23 |
| | 10 | 209.39 | 205 - | 214 | 209.84 | 1.51E+02 | 84.84 | 9.33E+02 | 1.93 |
| M | 11 | 238.54 | 234 - | 246 | 238.97 | 9.02E+02 | 73.93 | 4.34E+02 | 1.82 |
| m | 12 | 241.74 | 234 - | 246 | 242.17 | 1.97E+02 | 75.43 | 3.96E+02 | 1.82 |
| | 13 | 269.80 | 266 - | 273 | 270.20 | 1.14E+02 | 58.00 | 4.87E+02 | 4.61 |
| | 14 | 295.25 | 291 - | 301 | 295.62 | 2.62E+02 | 85.95 | 8.56E+02 | 1.81 |
| | 15 | 328.00 | 325 - | 331 | 328.33 | 4.99E+01 | 50.54 | 4.30E+02 | 1.89 |
| | 16 | 338.17 | 335 - | 341 | 338.49 | 1.62E+02 | 52.76 | 3.88E+02 | 1.74 |
| | 17 | 351.79 | 347 - | 356 | 352.11 | 4.77E+02 | 73.76 | 5.05E+02 | 1.74 |
| | 18 | 415.44 | 412 - | 418 | 415.68 | 3.43E+01 | 40.39 | 2.69E+02 | 1.42 |
| M | 19 | 462.92 | 460 - | 470 | 463.12 | 6.83E+01 | 39.09 | 2.35E+02 | 2.17 |
| m | 20 | 466.18 | 460 - | 470 | 466.37 | 2.98E+01 | 39.04 | 2.00E+02 | 2.18 |
| | 21 | 478.87 | 477 - | 482 | 479.06 | 2.52E+01 | 30.51 | 1.68E+02 | 1.95 |
| | 22 | 511.29 | 507 - | 516 | 511.44 | 1.63E+02 | 52.14 | 2.97E+02 | 1.84 |
| | 23 | 583.26 | 578 - | 588 | 583.34 | 2.47E+02 | 59.56 | 3.42E+02 | 1.89 |
| | 24 | 598.49 | 597 - | 601 | 598.55 | 1.97E+01 | 24.53 | 1.15E+02 | 1.41 |
| | 25 | 609.60 | 605 - | 615 | 609.66 | 3.93E+02 | 61.56 | 2.92E+02 | 2.05 |
| | 26 | 661.86 | 657 - | 667 | 661.86 | 1.01E+02 | 50.53 | 2.88E+02 | 1.86 |
| | 27 | 727.46 | 722 - | 732 | 727.40 | 8.46E+01 | 42.22 | 1.93E+02 | 2.33 |
| | 28 | 769.70 | 765 - | 777 | 769.59 | 5.35E+01 | 50.38 | 2.75E+02 | 3.27 |
| M | 29 | 795.19 | 792 - | 812 | 795.05 | 4.22E+01 | 22.69 | 7.83E+01 | 1.91 |
| m | 30 | 803.14 | 792 - | 812 | 803.00 | 1.57E+01 | 20.27 | 6.63E+01 | 1.96 |
| m | 31 | 806.56 | 792 - | 812 | 806.41 | 2.21E+01 | 23.53 | 7.18E+01 | 2.37 |
| | 32 | 825.01 | 822 - | 828 | 824.85 | 2.06E+01 | 21.56 | 6.87E+01 | 2.75 |
| | 33 | 833.43 | 829 - | 837 | 833.25 | 4.17E+01 | 27.44 | 9.06E+01 | 6.19 |
| | 34 | 841.33 | 838 - | 846 | 841.15 | 2.72E+01 | 29.57 | 1.20E+02 | 2.19 |
| | 35 | 860.69 | 855 - | 865 | 860.49 | 5.61E+01 | 35.44 | 1.38E+02 | 2.14 |
| | 36 | 892.45 | 889 - | 895 | 892.22 | 3.15E+01 | 24.62 | 8.70E+01 | 2.94 |
| | 37 | 911.57 | 907 - | 916 | 911.31 | 1.65E+02 | 46.11 | 2.08E+02 | 2.13 |
| M | 38 | 965.10 | 959 - | 974 | 964.80 | 5.19E+01 | 26.56 | 7.85E+01 | 2.22 |
| m | 39 | 969.35 | 959 - | 974 | 969.04 | 1.21E+02 | 30.61 | 6.91E+01 | 2.22 |
| | 40 | 983.15 | 981 - | 985 | 982.82 | 1.60E+01 | 17.00 | 5.00E+01 | 2.51 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 41 | 1059.15 | 1056 - | 1061 | 1058.75 | 1.92E+01 | 17.18 | 4.16E+01 | 2.74 |
| | 42 | 1064.68 | 1062 - | 1069 | 1064.28 | 2.35E+01 | 23.15 | 7.69E+01 | 2.18 |
| | 43 | 1121.08 | 1115 - | 1126 | 1120.62 | 8.67E+01 | 39.95 | 1.57E+02 | 2.10 |
| | 44 | 1164.74 | 1161 - | 1168 | 1164.24 | 2.14E+01 | 26.23 | 1.01E+02 | 1.19 |
| | 45 | 1281.63 | 1274 - | 1289 | 1281.02 | 4.69E+01 | 36.11 | 1.10E+02 | 5.56 |
| | 46 | 1377.68 | 1373 - | 1381 | 1376.96 | 2.52E+01 | 19.14 | 4.16E+01 | 3.62 |
| M | 47 | 1402.74 | 1397 - | 1415 | 1402.00 | 1.57E+01 | 18.19 | 3.76E+01 | 3.17 |
| m | 48 | 1407.75 | 1397 - | 1415 | 1407.01 | 2.11E+01 | 19.47 | 3.42E+01 | 3.18 |
| | 49 | 1445.39 | 1441 - | 1448 | 1444.61 | 1.98E+01 | 13.27 | 1.64E+01 | 4.02 |
| M | 50 | 1461.37 | 1455 - | 1477 | 1460.57 | 8.66E+02 | 61.01 | 3.58E+01 | 2.19 |
| m | 51 | 1466.02 | 1455 - | 1477 | 1465.22 | 2.44E+01 | 28.33 | 2.21E+01 | 2.24 |
| m | 52 | 1473.96 | 1455 - | 1477 | 1473.15 | 9.81E+00 | 18.06 | 3.03E+01 | 3.88 |
| | 53 | 1505.81 | 1491 - | 1517 | 1504.97 | 3.80E+01 | 40.15 | 9.20E+01 | 10.19 |
| | 54 | 1543.94 | 1541 - | 1545 | 1543.07 | 7.67E+00 | 8.54 | 8.67E+00 | 2.74 |
| | 55 | 1702.20 | 1696 - | 1705 | 1701.16 | 9.72E+00 | 11.79 | 1.26E+01 | 1.33 |
| | 56 | 1765.05 | 1758 - | 1770 | 1763.96 | 7.40E+01 | 22.74 | 2.60E+01 | 2.30 |
| | 57 | 1838.29 | 1832 - | 1840 | 1837.13 | 8.00E+00 | 5.66 | 0.00E+00 | 1.92 |
| M | 58 | 1881.09 | 1879 - | 1891 | 1879.89 | 7.40E+00 | 0.71 | 2.00E+00 | 3.07 |
| m | 59 | 1884.97 | 1879 - | 1891 | 1883.76 | 8.62E+00 | 10.79 | 1.15E+01 | 3.07 |
| m | 60 | 1889.73 | 1879 - | 1891 | 1888.52 | 9.49E+00 | 10.00 | 3.62E+00 | 2.79 |
| | 61 | 1925.58 | 1922 - | 1927 | 1924.33 | 9.00E+00 | 6.00 | 0.00E+00 | 1.66 |
| | 62 | 1945.47 | 1941 - | 1946 | 1944.20 | 5.25E+00 | 7.07 | 5.50E+00 | 1.84 |
| | 63 | 1963.00 | 1958 - | 1965 | 1961.71 | 1.40E+01 | 7.48 | 0.00E+00 | 2.08 |
| | 64 | 1971.86 | 1967 - | 1973 | 1970.57 | 7.00E+00 | 5.29 | 0.00E+00 | 1.47 |
| M | 65 | 2101.92 | 2098 - | 2111 | 2100.50 | 5.92E+00 | 6.04 | 5.00E+00 | 2.86 |
| m | 66 | 2105.42 | 2098 - | 2111 | 2104.00 | 1.87E+01 | 9.41 | 7.00E+00 | 2.36 |
| | 67 | 2203.99 | 2198 - | 2208 | 2202.48 | 1.68E+01 | 16.59 | 2.84E+01 | 1.86 |
| | 68 | 2265.18 | 2260 - | 2267 | 2263.60 | 1.00E+01 | 6.32 | 0.00E+00 | 3.16 |
| | 69 | 2313.11 | 2307 - | 2313 | 2311.49 | 4.75E+00 | 6.02 | 2.50E+00 | 1.08 |
| | 70 | 2338.38 | 2334 - | 2339 | 2336.74 | 6.69E+00 | 6.40 | 2.63E+00 | 2.91 |
| | 71 | 2370.82 | 2366 - | 2372 | 2369.14 | 1.40E+01 | 7.48 | 0.00E+00 | 2.79 |
| | 72 | 2615.12 | 2609 - | 2617 | 2613.21 | 1.01E+02 | 20.79 | 4.77E+00 | 3.04 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 1:08:24PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| M | 1 | 43.52 | 43 - | 52 | 3.84E+01 | 31.51 | 2.86E+02 | 2.78E+01 |
| m | 2 | 46.52 | 43 - | 52 | 1.30E+02 | 64.68 | 8.12E+02 | 4.68E+01 |
| | 3 | 63.26 | 61 - | 66 | 1.81E+02 | 91.93 | 1.54E+03 | 7.23E+01 |
| M | 4 | 74.56 | 71 - | 81 | 3.71E+02 | 93.07 | 1.38E+03 | 6.10E+01 |
| m | 5 | 77.26 | 71 - | 81 | 6.09E+02 | 99.93 | 1.33E+03 | 6.01E+01 |
| m | 6 | 87.57 | 83 - | 96 | 1.99E+02 | 77.63 | 1.13E+03 | 5.53E+01 |
| m | 7 | 92.27 | 83 - | 96 | 3.06E+02 | 81.97 | 1.05E+03 | 5.33E+01 |
| | 8 | 99.81 | 98 - | 103 | 7.73E+01 | 73.61 | 1.01E+03 | 5.88E+01 |
| | 9 | 185.97 | 182 - | 191 | 2.46E+02 | 95.28 | 1.16E+03 | 7.40E+01 |
| | 10 | 209.39 | 205 - | 214 | 1.51E+02 | 84.84 | 9.33E+02 | 6.67E+01 |
| M | 11 | 238.54 | 234 - | 246 | 9.02E+02 | 73.93 | 4.34E+02 | 3.42E+01 |
| m | 12 | 241.74 | 234 - | 246 | 1.97E+02 | 75.43 | 3.96E+02 | 3.27E+01 |
| | 13 | 269.80 | 266 - | 273 | 1.14E+02 | 58.00 | 4.87E+02 | 4.43E+01 |
| | 14 | 295.25 | 291 - | 301 | 2.62E+02 | 85.95 | 8.56E+02 | 6.55E+01 |
| | 15 | 328.00 | 325 - | 331 | 4.99E+01 | 50.54 | 4.30E+02 | 3.99E+01 |
| | 16 | 338.17 | 335 - | 341 | 1.62E+02 | 52.76 | 3.88E+02 | 3.80E+01 |
| | 17 | 351.79 | 347 - | 356 | 4.77E+02 | 73.76 | 5.05E+02 | 4.89E+01 |
| | 18 | 415.44 | 412 - | 418 | 3.43E+01 | 40.39 | 2.69E+02 | 3.18E+01 |
| M | 19 | 462.92 | 460 - | 470 | 6.83E+01 | 39.09 | 2.35E+02 | 2.52E+01 |
| m | 20 | 466.18 | 460 - | 470 | 2.98E+01 | 39.04 | 2.00E+02 | 2.32E+01 |
| | 21 | 478.87 | 477 - | 482 | 2.52E+01 | 30.51 | 1.68E+02 | 2.37E+01 |
| | 22 | 511.29 | 507 - | 516 | 1.63E+02 | 52.14 | 2.97E+02 | 3.74E+01 |
| | 23 | 583.26 | 578 - | 588 | 2.47E+02 | 59.56 | 3.42E+02 | 4.16E+01 |
| | 24 | 598.49 | 597 - | 601 | 1.97E+01 | 24.53 | 1.15E+02 | 1.88E+01 |
| | 25 | 609.60 | 605 - | 615 | 3.93E+02 | 61.56 | 2.92E+02 | 3.87E+01 |
| | 26 | 661.86 | 657 - | 667 | 1.01E+02 | 50.53 | 2.88E+02 | 3.81E+01 |
| | 27 | 727.46 | 722 - | 732 | 8.46E+01 | 42.22 | 1.93E+02 | 3.12E+01 |
| | 28 | 769.70 | 765 - | 777 | 5.35E+01 | 50.38 | 2.75E+02 | 3.96E+01 |
| M | 29 | 795.19 | 792 - | 812 | 4.22E+01 | 22.69 | 7.83E+01 | 1.45E+01 |
| m | 30 | 803.14 | 792 - | 812 | 1.57E+01 | 20.27 | 6.63E+01 | 1.34E+01 |
| m | 31 | 806.56 | 792 - | 812 | 2.21E+01 | 23.53 | 7.18E+01 | 1.39E+01 |
| | 32 | 825.01 | 822 - | 828 | 2.06E+01 | 21.56 | 6.87E+01 | 1.61E+01 |
| | 33 | 833.43 | 829 - | 837 | 4.17E+01 | 27.44 | 9.06E+01 | 1.99E+01 |
| | 34 | 841.33 | 838 - | 846 | 2.72E+01 | 29.57 | 1.20E+02 | 2.27E+01 |
| | 35 | 860.69 | 855 - | 865 | 5.61E+01 | 35.44 | 1.38E+02 | 2.64E+01 |
| | 36 | 892.45 | 889 - | 895 | 3.15E+01 | 24.62 | 8.70E+01 | 1.80E+01 |
| | 37 | 911.57 | 907 - | 916 | 1.65E+02 | 46.11 | 2.08E+02 | 3.15E+01 |
| M | 38 | 965.10 | 959 - | 974 | 5.19E+01 | 26.56 | 7.85E+01 | 1.46E+01 |
| m | 39 | 969.35 | 959 - | 974 | 1.21E+02 | 30.61 | 6.91E+01 | 1.37E+01 |
| | 40 | 983.15 | 981 - | 985 | 1.60E+01 | 17.00 | 5.00E+01 | 1.23E+01 |
| | 41 | 1059.15 | 1056 - | 1061 | 1.92E+01 | 17.18 | 4.16E+01 | 1.21E+01 |
| | 42 | 1064.68 | 1062 - | 1069 | 2.35E+01 | 23.15 | 7.69E+01 | 1.73E+01 |
| | 43 | 1121.08 | 1115 - | 1126 | 8.67E+01 | 39.95 | 1.57E+02 | 2.91E+01 |
| | 44 | 1164.74 | 1161 - | 1168 | 2.14E+01 | 26.23 | 1.01E+02 | 2.02E+01 |
| | 45 | 1281.63 | 1274 - | 1289 | 4.69E+01 | 36.11 | 1.10E+02 | 2.75E+01 |
| | 46 | 1377.68 | 1373 - | 1381 | 2.52E+01 | 19.14 | 4.16E+01 | 1.34E+01 |
| M | 47 | 1402.74 | 1397 - | 1415 | 1.57E+01 | 18.19 | 3.76E+01 | 1.01E+01 |
| m | 48 | 1407.75 | 1397 - | 1415 | 2.11E+01 | 19.47 | 3.42E+01 | 9.61E+00 |
| | 49 | 1445.39 | 1441 - | 1448 | 1.98E+01 | 13.27 | 1.64E+01 | 8.08E+00 |
| M | 50 | 1461.37 | 1455 - | 1477 | 8.66E+02 | 61.01 | 3.58E+01 | 9.84E+00 |
| m | 51 | 1466.02 | 1455 - | 1477 | 2.44E+01 | 28.33 | 2.21E+01 | 7.72E+00 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| m | 52 | 1473.96 | 1455 - | 1477 | 9.81E+00 | 18.06 | 3.03E+01 | 9.05E+00 |
| | 53 | 1505.81 | 1491 - | 1517 | 3.80E+01 | 40.15 | 9.20E+01 | 8.89E+00 |
| | 54 | 1543.94 | 1541 - | 1545 | 7.67E+00 | 8.54 | 8.67E+00 | 5.35E+00 |
| | 55 | 1702.20 | 1696 - | 1705 | 9.72E+00 | 11.79 | 1.26E+01 | 8.23E+00 |
| | 56 | 1765.05 | 1758 - | 1770 | 7.40E+01 | 22.74 | 2.60E+01 | 1.22E+01 |
| | 57 | 1838.29 | 1832 - | 1840 | 8.00E+00 | 5.66 | 0.00E+00 | 0.00E+00 |
| M | 58 | 1881.09 | 1879 - | 1891 | 7.40E+00 | 0.71 | 2.00E+00 | 2.33E+00 |
| m | 59 | 1884.97 | 1879 - | 1891 | 8.62E+00 | 10.79 | 1.15E+01 | 5.57E+00 |
| m | 60 | 1889.73 | 1879 - | 1891 | 9.49E+00 | 10.00 | 3.62E+00 | 3.13E+00 |
| | 61 | 1925.58 | 1922 - | 1927 | 9.00E+00 | 6.00 | 0.00E+00 | 0.00E+00 |
| | 62 | 1945.47 | 1941 - | 1946 | 5.25E+00 | 7.07 | 5.50E+00 | 4.43E+00 |
| | 63 | 1963.00 | 1958 - | 1965 | 1.40E+01 | 7.48 | 0.00E+00 | 0.00E+00 |
| | 64 | 1971.86 | 1967 - | 1973 | 7.00E+00 | 5.29 | 0.00E+00 | 0.00E+00 |
| M | 65 | 2101.92 | 2098 - | 2111 | 5.92E+00 | 6.04 | 5.00E+00 | 3.68E+00 |
| m | 66 | 2105.42 | 2098 - | 2111 | 1.87E+01 | 9.41 | 7.00E+00 | 4.35E+00 |
| | 67 | 2203.99 | 2198 - | 2208 | 1.68E+01 | 16.59 | 2.84E+01 | 1.19E+01 |
| | 68 | 2265.18 | 2260 - | 2267 | 1.00E+01 | 6.32 | 0.00E+00 | 0.00E+00 |
| | 69 | 2313.11 | 2307 - | 2313 | 4.75E+00 | 6.02 | 2.50E+00 | 3.41E+00 |
| | 70 | 2338.38 | 2334 - | 2339 | 6.69E+00 | 6.40 | 2.63E+00 | 3.10E+00 |
| | 71 | 2370.82 | 2366 - | 2372 | 1.40E+01 | 7.48 | 0.00E+00 | 0.00E+00 |
| | 72 | 2615.12 | 2609 - | 2617 | 1.01E+02 | 20.79 | 4.77E+00 | 4.49E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 1:08:24PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| M | 1 | 43.52 | 43 - | 52 | 44.14 | 3.84E+01 | 31.51 | 2.86E+02 | ..... |
| m | 2 | 46.52 | 43 - | 52 | 47.15 | 1.30E+02 | 64.68 | 8.12E+02 | PB-210 |
| | 3 | 63.26 | 61 - | 66 | 63.86 | 1.81E+02 | 91.93 | 1.54E+03 | TH-234 |
| | | | | | | | | | TH-230 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| M | 4 | 74.56 | 71 - | 81 | 75.15 | 3.71E+02 | 93.07 | 1.38E+03 | AM-243 |
| m | 5 | 77.26 | 71 - | 81 | 77.85 | 6.09E+02 | 99.93 | 1.33E+03 | ..... |
| m | 6 | 87.57 | 83 - | 96 | 88.15 | 1.99E+02 | 77.63 | 1.13E+03 | SN-126 |
| | | | | | | | | | CD-109 |
| | | | | | | | | | LU-176 |
| m | 7 | 92.27 | 83 - | 96 | 92.85 | 3.06E+02 | 81.97 | 1.05E+03 | ..... |
| | 8 | 99.81 | 98 - | 103 | 100.37 | 7.73E+01 | 73.61 | 1.01E+03 | LU-173 |
| | 9 | 185.97 | 182 - | 191 | 186.45 | 2.46E+02 | 95.28 | 1.16E+03 | RA-226 |
| | 10 | 209.39 | 205 - | 214 | 209.84 | 1.51E+02 | 84.84 | 9.33E+02 | CM-243 |
| | | | | | | | | | GA-67 |
| M | 11 | 238.54 | 234 - | 246 | 238.97 | 9.02E+02 | 73.93 | 4.34E+02 | PB-212 |
| m | 12 | 241.74 | 234 - | 246 | 242.17 | 1.97E+02 | 75.43 | 3.96E+02 | RA-224 |
| | 13 | 269.80 | 266 - | 273 | 270.20 | 1.14E+02 | 58.00 | 4.87E+02 | ..... |
| | 14 | 295.25 | 291 - | 301 | 295.62 | 2.62E+02 | 85.95 | 8.56E+02 | PB-214 |
| | 15 | 328.00 | 325 - | 331 | 328.33 | 4.99E+01 | 50.54 | 4.30E+02 | LA-140 |
| | 16 | 338.17 | 335 - | 341 | 338.49 | 1.62E+02 | 52.76 | 3.88E+02 | AC-228 |
| | 17 | 351.79 | 347 - | 356 | 352.11 | 4.77E+02 | 73.76 | 5.05E+02 | PB-214 |
| | 18 | 415.44 | 412 - | 418 | 415.68 | 3.43E+01 | 40.39 | 2.69E+02 | SB-126 |
| M | 19 | 462.92 | 460 - | 470 | 463.12 | 6.83E+01 | 39.09 | 2.35E+02 | SB-125 |
| m | 20 | 466.18 | 460 - | 470 | 466.37 | 2.98E+01 | 39.04 | 2.00E+02 | ..... |
| | 21 | 478.87 | 477 - | 482 | 479.06 | 2.52E+01 | 30.51 | 1.68E+02 | ..... |
| | 22 | 511.29 | 507 - | 516 | 511.44 | 1.63E+02 | 52.14 | 2.97E+02 | ..... |
| | 23 | 583.26 | 578 - | 588 | 583.34 | 2.47E+02 | 59.56 | 3.42E+02 | TL-208 |
| | 24 | 598.49 | 597 - | 601 | 598.55 | 1.97E+01 | 24.53 | 1.15E+02 | ..... |
| | 25 | 609.60 | 605 - | 615 | 609.66 | 3.93E+02 | 61.56 | 2.92E+02 | BI-214 |
| | 26 | 661.86 | 657 - | 667 | 661.86 | 1.01E+02 | 50.53 | 2.88E+02 | CS-137 |
| | 27 | 727.46 | 722 - | 732 | 727.40 | 8.46E+01 | 42.22 | 1.93E+02 | BI-212 |
| | 28 | 769.70 | 765 - | 777 | 769.59 | 5.35E+01 | 50.38 | 2.75E+02 | ..... |
| M | 29 | 795.19 | 792 - | 812 | 795.05 | 4.22E+01 | 22.69 | 7.83E+01 | CS-134 |
| m | 30 | 803.14 | 792 - | 812 | 803.00 | 1.57E+01 | 20.27 | 6.63E+01 | ..... |
| m | 31 | 806.56 | 792 - | 812 | 806.41 | 2.21E+01 | 23.53 | 7.18E+01 | ..... |
| | 32 | 825.01 | 822 - | 828 | 824.85 | 2.06E+01 | 21.56 | 6.87E+01 | ..... |
| | 33 | 833.43 | 829 - | 837 | 833.25 | 4.17E+01 | 27.44 | 9.06E+01 | ..... |
| | 34 | 841.33 | 838 - | 846 | 841.15 | 2.72E+01 | 29.57 | 1.20E+02 | ..... |
| | 35 | 860.69 | 855 - | 865 | 860.49 | 5.61E+01 | 35.44 | 1.38E+02 | TL-208 |
| | 36 | 892.45 | 889 - | 895 | 892.22 | 3.15E+01 | 24.62 | 8.70E+01 | ..... |
| | 37 | 911.57 | 907 - | 916 | 911.31 | 1.65E+02 | 46.11 | 2.08E+02 | TL-204 |
| | | | | | | | | | AC-228 |
| M | 38 | 965.10 | 959 - | 974 | 964.80 | 5.19E+01 | 26.56 | 7.85E+01 | ..... |
| m | 39 | 969.35 | 959 - | 974 | 969.04 | 1.21E+02 | 30.61 | 6.91E+01 | AC-228 |
| | 40 | 983.15 | 981 - | 985 | 982.82 | 1.60E+01 | 17.00 | 5.00E+01 | V-48 |
| | 41 | 1059.15 | 1056 - | 1061 | 1058.75 | 1.92E+01 | 17.18 | 4.16E+01 | ..... |
| | 42 | 1064.68 | 1062 - | 1069 | 1064.28 | 2.35E+01 | 23.15 | 7.69E+01 | ..... |
| | 43 | 1121.08 | 1115 - | 1126 | 1120.62 | 8.67E+01 | 39.95 | 1.57E+02 | TA-182 |
| | | | | | | | | | SC-46 |
| | | | | | | | | | BI-214 |
| | 44 | 1164.74 | 1161 - | 1168 | 1164.24 | 2.14E+01 | 26.23 | 1.01E+02 | ..... |
| | 45 | 1281.63 | 1274 - | 1289 | 1281.02 | 4.69E+01 | 36.11 | 1.10E+02 | ..... |
| | 46 | 1377.68 | 1373 - | 1381 | 1376.96 | 2.52E+01 | 19.14 | 4.16E+01 | ..... |
| M | 47 | 1402.74 | 1397 - | 1415 | 1402.00 | 1.57E+01 | 18.19 | 3.76E+01 | ..... |
| m | 48 | 1407.75 | 1397 - | 1415 | 1407.01 | 2.11E+01 | 19.47 | 3.42E+01 | EU-152 |
| | 49 | 1445.39 | 1441 - | 1448 | 1444.61 | 1.98E+01 | 13.27 | 1.64E+01 | ..... |
| M | 50 | 1461.37 | 1455 - | 1477 | 1460.57 | 8.66E+02 | 61.01 | 3.58E+01 | K-40 |
| m | 51 | 1466.02 | 1455 - | 1477 | 1465.22 | 2.44E+01 | 28.33 | 2.21E+01 | ..... |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| m | 52 | 1473.96 | 1455 - | 1477 | 1473.15 | 9.81E+00 | 18.06 | 3.03E+01 | ..... |
| | 53 | 1505.81 | 1491 - | 1517 | 1504.97 | 3.80E+01 | 40.15 | 9.20E+01 | ..... |
| | 54 | 1543.94 | 1541 - | 1545 | 1543.07 | 7.67E+00 | 8.54 | 8.67E+00 | ..... |
| | 55 | 1702.20 | 1696 - | 1705 | 1701.16 | 9.72E+00 | 11.79 | 1.26E+01 | ..... |
| | 56 | 1765.05 | 1758 - | 1770 | 1763.96 | 7.40E+01 | 22.74 | 2.60E+01 | BI-214 |
| | 57 | 1838.29 | 1832 - | 1840 | 1837.13 | 8.00E+00 | 5.66 | 0.00E+00 | ..... |
| M | 58 | 1881.09 | 1879 - | 1891 | 1879.89 | 7.40E+00 | 0.71 | 2.00E+00 | ..... |
| m | 59 | 1884.97 | 1879 - | 1891 | 1883.76 | 8.62E+00 | 10.79 | 1.15E+01 | ..... |
| m | 60 | 1889.73 | 1879 - | 1891 | 1888.52 | 9.49E+00 | 10.00 | 3.62E+00 | ..... |
| | 61 | 1925.58 | 1922 - | 1927 | 1924.33 | 9.00E+00 | 6.00 | 0.00E+00 | ..... |
| | 62 | 1945.47 | 1941 - | 1946 | 1944.20 | 5.25E+00 | 7.07 | 5.50E+00 | ..... |
| | 63 | 1963.00 | 1958 - | 1965 | 1961.71 | 1.40E+01 | 7.48 | 0.00E+00 | ..... |
| | 64 | 1971.86 | 1967 - | 1973 | 1970.57 | 7.00E+00 | 5.29 | 0.00E+00 | ..... |
| M | 65 | 2101.92 | 2098 - | 2111 | 2100.50 | 5.92E+00 | 6.04 | 5.00E+00 | ..... |
| m | 66 | 2105.42 | 2098 - | 2111 | 2104.00 | 1.87E+01 | 9.41 | 7.00E+00 | ..... |
| | 67 | 2203.99 | 2198 - | 2208 | 2202.48 | 1.68E+01 | 16.59 | 2.84E+01 | BI-214 |
| | 68 | 2265.18 | 2260 - | 2267 | 2263.60 | 1.00E+01 | 6.32 | 0.00E+00 | ..... |
| | 69 | 2313.11 | 2307 - | 2313 | 2311.49 | 4.75E+00 | 6.02 | 2.50E+00 | ..... |
| | 70 | 2338.38 | 2334 - | 2339 | 2336.74 | 6.69E+00 | 6.40 | 2.63E+00 | ..... |
| | 71 | 2370.82 | 2366 - | 2372 | 2369.14 | 1.40E+01 | 7.48 | 0.00E+00 | ..... |
| | 72 | 2615.12 | 2609 - | 2617 | 2613.21 | 1.01E+02 | 20.79 | 4.77E+00 | TL-208 |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 1:08:24PM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| M | 1 | 43.52 | 3.84E+01 | 31.51 | 2.39E-02 | 2.22E-03 |
| m | 2 | 46.52 | 1.30E+02 | 64.68 | 2.47E-02 | 2.22E-03 |
| | 3 | 63.26 | 1.81E+02 | 91.93 | 2.70E-02 | 2.26E-03 |
| M | 4 | 74.56 | 3.71E+02 | 93.07 | 2.75E-02 | 2.38E-03 |
| m | 5 | 77.26 | 6.09E+02 | 99.93 | 2.75E-02 | 2.41E-03 |
| m | 6 | 87.57 | 1.99E+02 | 77.63 | 2.74E-02 | 2.52E-03 |
| m | 7 | 92.27 | 3.06E+02 | 81.97 | 2.73E-02 | 2.45E-03 |
| | 8 | 99.81 | 7.73E+01 | 73.61 | 2.70E-02 | 2.33E-03 |
| | 9 | 185.97 | 2.46E+02 | 95.28 | 2.17E-02 | 1.68E-03 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 10 | 209.39 | 1.51E+02 | 84.84 | 2.04E-02 | 1.61E-03 |
| M | 11 | 238.54 | 9.02E+02 | 73.93 | 1.89E-02 | 1.53E-03 |
| m | 12 | 241.74 | 1.97E+02 | 75.43 | 1.87E-02 | 1.52E-03 |
| | 13 | 269.80 | 1.14E+02 | 58.00 | 1.75E-02 | 1.44E-03 |
| | 14 | 295.25 | 2.62E+02 | 85.95 | 1.64E-02 | 1.37E-03 |
| | 15 | 328.00 | 4.99E+01 | 50.54 | 1.53E-02 | 1.29E-03 |
| | 16 | 338.17 | 1.62E+02 | 52.76 | 1.50E-02 | 1.27E-03 |
| | 17 | 351.79 | 4.77E+02 | 73.76 | 1.45E-02 | 1.24E-03 |
| | 18 | 415.44 | 3.43E+01 | 40.39 | 1.29E-02 | 1.13E-03 |
| M | 19 | 462.92 | 6.83E+01 | 39.09 | 1.19E-02 | 1.10E-03 |
| m | 20 | 466.18 | 2.98E+01 | 39.04 | 1.18E-02 | 1.10E-03 |
| | 21 | 478.87 | 2.52E+01 | 30.51 | 1.16E-02 | 1.09E-03 |
| | 22 | 511.29 | 1.63E+02 | 52.14 | 1.10E-02 | 1.07E-03 |
| | 23 | 583.26 | 2.47E+02 | 59.56 | 9.96E-03 | 1.02E-03 |
| | 24 | 598.49 | 1.97E+01 | 24.53 | 9.77E-03 | 1.01E-03 |
| | 25 | 609.60 | 3.93E+02 | 61.56 | 9.63E-03 | 1.01E-03 |
| | 26 | 661.86 | 1.01E+02 | 50.53 | 9.04E-03 | 9.72E-04 |
| | 27 | 727.46 | 8.46E+01 | 42.22 | 8.41E-03 | 8.67E-04 |
| | 28 | 769.70 | 5.35E+01 | 50.38 | 8.05E-03 | 8.00E-04 |
| M | 29 | 795.19 | 4.22E+01 | 22.69 | 7.86E-03 | 7.60E-04 |
| m | 30 | 803.14 | 1.57E+01 | 20.27 | 7.80E-03 | 7.47E-04 |
| m | 31 | 806.56 | 2.21E+01 | 23.53 | 7.77E-03 | 7.42E-04 |
| | 32 | 825.01 | 2.06E+01 | 21.56 | 7.64E-03 | 7.12E-04 |
| | 33 | 833.43 | 4.17E+01 | 27.44 | 7.58E-03 | 6.99E-04 |
| | 34 | 841.33 | 2.72E+01 | 29.57 | 7.53E-03 | 6.87E-04 |
| | 35 | 860.69 | 5.61E+01 | 35.44 | 7.40E-03 | 6.56E-04 |
| | 36 | 892.45 | 3.15E+01 | 24.62 | 7.20E-03 | 6.05E-04 |
| | 37 | 911.57 | 1.65E+02 | 46.11 | 7.08E-03 | 5.91E-04 |
| M | 38 | 965.10 | 5.19E+01 | 26.56 | 6.79E-03 | 5.71E-04 |
| m | 39 | 969.35 | 1.21E+02 | 30.61 | 6.76E-03 | 5.69E-04 |
| | 40 | 983.15 | 1.60E+01 | 17.00 | 6.69E-03 | 5.64E-04 |
| | 41 | 1059.15 | 1.92E+01 | 17.18 | 6.33E-03 | 5.35E-04 |
| | 42 | 1064.68 | 2.35E+01 | 23.15 | 6.31E-03 | 5.33E-04 |
| | 43 | 1121.08 | 8.67E+01 | 39.95 | 6.07E-03 | 5.11E-04 |
| | 44 | 1164.74 | 2.14E+01 | 26.23 | 5.90E-03 | 4.94E-04 |
| | 45 | 1281.63 | 4.69E+01 | 36.11 | 5.50E-03 | 4.66E-04 |
| | 46 | 1377.68 | 2.52E+01 | 19.14 | 5.22E-03 | 4.44E-04 |
| M | 47 | 1402.74 | 1.57E+01 | 18.19 | 5.15E-03 | 4.38E-04 |
| m | 48 | 1407.75 | 2.11E+01 | 19.47 | 5.14E-03 | 4.37E-04 |
| | 49 | 1445.39 | 1.98E+01 | 13.27 | 5.04E-03 | 4.28E-04 |
| M | 50 | 1461.37 | 8.66E+02 | 61.01 | 5.00E-03 | 4.25E-04 |
| m | 51 | 1466.02 | 2.44E+01 | 28.33 | 4.99E-03 | 4.24E-04 |
| m | 52 | 1473.96 | 9.81E+00 | 18.06 | 4.97E-03 | 4.22E-04 |
| | 53 | 1505.81 | 3.80E+01 | 40.15 | 4.90E-03 | 4.14E-04 |
| | 54 | 1543.94 | 7.67E+00 | 8.54 | 4.81E-03 | 4.05E-04 |
| | 55 | 1702.20 | 9.72E+00 | 11.79 | 4.49E-03 | 3.69E-04 |
| | 56 | 1765.05 | 7.40E+01 | 22.74 | 4.37E-03 | 3.54E-04 |
| | 57 | 1838.29 | 8.00E+00 | 5.66 | 4.25E-03 | 3.38E-04 |
| M | 58 | 1881.09 | 7.40E+00 | 0.71 | 4.18E-03 | 3.38E-04 |
| m | 59 | 1884.97 | 8.62E+00 | 10.79 | 4.17E-03 | 3.38E-04 |
| m | 60 | 1889.73 | 9.49E+00 | 10.00 | 4.17E-03 | 3.38E-04 |
| | 61 | 1925.58 | 9.00E+00 | 6.00 | 4.11E-03 | 3.38E-04 |
| | 62 | 1945.47 | 5.25E+00 | 7.07 | 4.08E-03 | 3.38E-04 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 63 | 1963.00 | 1.40E+01 | 7.48 | 4.06E-03 | 3.38E-04 |
| | 64 | 1971.86 | 7.00E+00 | 5.29 | 4.04E-03 | 3.38E-04 |
| M | 65 | 2101.92 | 5.92E+00 | 6.04 | 3.86E-03 | 3.38E-04 |
| m | 66 | 2105.42 | 1.87E+01 | 9.41 | 3.86E-03 | 3.38E-04 |
| | 67 | 2203.99 | 1.68E+01 | 16.59 | 3.74E-03 | 3.38E-04 |
| | 68 | 2265.18 | 1.00E+01 | 6.32 | 3.66E-03 | 3.38E-04 |
| | 69 | 2313.11 | 4.75E+00 | 6.02 | 3.61E-03 | 3.38E-04 |
| | 70 | 2338.38 | 6.69E+00 | 6.40 | 3.58E-03 | 3.38E-04 |
| | 71 | 2370.82 | 1.40E+01 | 7.48 | 3.55E-03 | 3.38E-04 |
| | 72 | 2615.12 | 1.01E+02 | 20.79 | 3.31E-03 | 3.38E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 1:08:24PM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| M | 1 | 43.52 | 3.84E+01 | 31.51 | | | 3.84E+01 | 3.15E+01 |
| m | 2 | 46.52 | 1.30E+02 | 64.68 | 3.67E+01 | 8.40E+00 | 9.34E+01 | 6.52E+01 |
| | 3 | 63.26 | 1.81E+02 | 91.93 | 8.94E+01 | 1.41E+01 | 9.19E+01 | 9.30E+01 |
| M | 4 | 74.56 | 3.71E+02 | 93.07 | | | 3.71E+02 | 9.31E+01 |
| m | 5 | 77.26 | 6.09E+02 | 99.93 | 7.20E+00 | 1.47E+00 | 6.01E+02 | 9.99E+01 |
| m | 6 | 87.57 | 1.99E+02 | 77.63 | | | 1.99E+02 | 7.76E+01 |
| m | 7 | 92.27 | 3.06E+02 | 81.97 | 1.38E+02 | 1.72E+01 | 1.69E+02 | 8.37E+01 |
| | 8 | 99.81 | 7.73E+01 | 73.61 | | | 7.73E+01 | 7.36E+01 |
| | 9 | 185.97 | 2.46E+02 | 95.28 | 5.22E+01 | 7.59E+00 | 1.94E+02 | 9.56E+01 |
| | 10 | 209.39 | 1.51E+02 | 84.84 | | | 1.51E+02 | 8.48E+01 |
| M | 11 | 238.54 | 9.02E+02 | 73.93 | 2.13E+01 | 6.33E+00 | 8.81E+02 | 7.42E+01 |
| m | 12 | 241.74 | 1.97E+02 | 75.43 | | | 1.97E+02 | 7.54E+01 |
| | 13 | 269.80 | 1.14E+02 | 58.00 | 1.23E+00 | 4.98E+00 | 1.12E+02 | 5.82E+01 |
| | 14 | 295.25 | 2.62E+02 | 85.95 | | | 2.62E+02 | 8.60E+01 |
| | 15 | 328.00 | 4.99E+01 | 50.54 | | | 4.99E+01 | 5.05E+01 |
| | 16 | 338.17 | 1.62E+02 | 52.76 | | | 1.62E+02 | 5.28E+01 |
| | 17 | 351.79 | 4.77E+02 | 73.76 | 5.79E+00 | 4.49E+00 | 4.71E+02 | 7.39E+01 |
| | 18 | 415.44 | 3.43E+01 | 40.39 | | | 3.43E+01 | 4.04E+01 |
| M | 19 | 462.92 | 6.83E+01 | 39.09 | | | 6.83E+01 | 3.91E+01 |
| m | 20 | 466.18 | 2.98E+01 | 39.04 | | | 2.98E+01 | 3.90E+01 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 21 | 478.87 | 2.52E+01 | 30.51 | | | 2.52E+01 | 3.05E+01 |
| | 22 | 511.29 | 1.63E+02 | 52.14 | 7.28E+01 | 5.30E+00 | 8.99E+01 | 5.24E+01 |
| | 23 | 583.26 | 2.47E+02 | 59.56 | 2.72E+00 | 3.05E+00 | 2.44E+02 | 5.96E+01 |
| | 24 | 598.49 | 1.97E+01 | 24.53 | | | 1.97E+01 | 2.45E+01 |
| | 25 | 609.60 | 3.93E+02 | 61.56 | 6.35E+00 | 4.02E+00 | 3.87E+02 | 6.17E+01 |
| | 26 | 661.86 | 1.01E+02 | 50.53 | | | 1.01E+02 | 5.05E+01 |
| | 27 | 727.46 | 8.46E+01 | 42.22 | | | 8.46E+01 | 4.22E+01 |
| | 28 | 769.70 | 5.35E+01 | 50.38 | | | 5.35E+01 | 5.04E+01 |
| M | 29 | 795.19 | 4.22E+01 | 22.69 | | | 4.22E+01 | 2.27E+01 |
| m | 30 | 803.14 | 1.57E+01 | 20.27 | | | 1.57E+01 | 2.03E+01 |
| m | 31 | 806.56 | 2.21E+01 | 23.53 | | | 2.21E+01 | 2.35E+01 |
| | 32 | 825.01 | 2.06E+01 | 21.56 | | | 2.06E+01 | 2.16E+01 |
| | 33 | 833.43 | 4.17E+01 | 27.44 | | | 4.17E+01 | 2.74E+01 |
| | 34 | 841.33 | 2.72E+01 | 29.57 | | | 2.72E+01 | 2.96E+01 |
| | 35 | 860.69 | 5.61E+01 | 35.44 | | | 5.61E+01 | 3.54E+01 |
| | 36 | 892.45 | 3.15E+01 | 24.62 | | | 3.15E+01 | 2.46E+01 |
| | 37 | 911.57 | 1.65E+02 | 46.11 | 5.31E+00 | 3.00E+00 | 1.60E+02 | 4.62E+01 |
| M | 38 | 965.10 | 5.19E+01 | 26.56 | | | 5.19E+01 | 2.66E+01 |
| m | 39 | 969.35 | 1.21E+02 | 30.61 | | | 1.21E+02 | 3.06E+01 |
| | 40 | 983.15 | 1.60E+01 | 17.00 | | | 1.60E+01 | 1.70E+01 |
| | 41 | 1059.15 | 1.92E+01 | 17.18 | | | 1.92E+01 | 1.72E+01 |
| | 42 | 1064.68 | 2.35E+01 | 23.15 | | | 2.35E+01 | 2.32E+01 |
| | 43 | 1121.08 | 8.67E+01 | 39.95 | | | 8.67E+01 | 3.99E+01 |
| | 44 | 1164.74 | 2.14E+01 | 26.23 | | | 2.14E+01 | 2.62E+01 |
| | 45 | 1281.63 | 4.69E+01 | 36.11 | | | 4.69E+01 | 3.61E+01 |
| | 46 | 1377.68 | 2.52E+01 | 19.14 | | | 2.52E+01 | 1.91E+01 |
| M | 47 | 1402.74 | 1.57E+01 | 18.19 | | | 1.57E+01 | 1.82E+01 |
| m | 48 | 1407.75 | 2.11E+01 | 19.47 | | | 2.11E+01 | 1.95E+01 |
| | 49 | 1445.39 | 1.98E+01 | 13.27 | | | 1.98E+01 | 1.33E+01 |
| M | 50 | 1461.37 | 8.66E+02 | 61.01 | 8.09E+00 | 2.23E+00 | 8.58E+02 | 6.11E+01 |
| m | 51 | 1466.02 | 2.44E+01 | 28.33 | | | 2.44E+01 | 2.83E+01 |
| m | 52 | 1473.96 | 9.81E+00 | 18.06 | | | 9.81E+00 | 1.81E+01 |
| | 53 | 1505.81 | 3.80E+01 | 40.15 | | | 3.80E+01 | 4.01E+01 |
| | 54 | 1543.94 | 7.67E+00 | 8.54 | | | 7.67E+00 | 8.54E+00 |
| | 55 | 1702.20 | 9.72E+00 | 11.79 | | | 9.72E+00 | 1.18E+01 |
| | 56 | 1765.05 | 7.40E+01 | 22.74 | | | 7.40E+01 | 2.27E+01 |
| | 57 | 1838.29 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| M | 58 | 1881.09 | 7.40E+00 | 0.71 | | | 7.40E+00 | 7.07E-01 |
| m | 59 | 1884.97 | 8.62E+00 | 10.79 | | | 8.62E+00 | 1.08E+01 |
| m | 60 | 1889.73 | 9.49E+00 | 10.00 | | | 9.49E+00 | 1.00E+01 |
| | 61 | 1925.58 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| | 62 | 1945.47 | 5.25E+00 | 7.07 | | | 5.25E+00 | 7.07E+00 |
| | 63 | 1963.00 | 1.40E+01 | 7.48 | | | 1.40E+01 | 7.48E+00 |
| | 64 | 1971.86 | 7.00E+00 | 5.29 | | | 7.00E+00 | 5.29E+00 |
| M | 65 | 2101.92 | 5.92E+00 | 6.04 | | | 5.92E+00 | 6.04E+00 |
| m | 66 | 2105.42 | 1.87E+01 | 9.41 | | | 1.87E+01 | 9.41E+00 |
| | 67 | 2203.99 | 1.68E+01 | 16.59 | | | 1.68E+01 | 1.66E+01 |
| | 68 | 2265.18 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| | 69 | 2313.11 | 4.75E+00 | 6.02 | | | 4.75E+00 | 6.02E+00 |
| | 70 | 2338.38 | 6.69E+00 | 6.40 | | | 6.69E+00 | 6.40E+00 |
| | 71 | 2370.82 | 1.40E+01 | 7.48 | | | 1.40E+01 | 7.48E+00 |
| | 72 | 2615.12 | 1.01E+02 | 20.79 | 5.63E+00 | 1.38E+00 | 9.50E+01 | 2.08E+01 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 1:08:24PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| M | 1 | 43.52 | 3.84E+01 | 31.51 | | | 3.84E+01 | 3.15E+01 |
| m | 2 | 46.52 | 1.30E+02 | 64.68 | 3.67E+01 | 8.40E+00 | 9.34E+01 | 6.52E+01 |
| | 3 | 63.26 | 1.81E+02 | 91.93 | 8.94E+01 | 1.41E+01 | 9.19E+01 | 9.30E+01 |
| M | 4 | 74.56 | 3.71E+02 | 93.07 | | | 3.71E+02 | 9.31E+01 |
| m | 5 | 77.26 | 6.09E+02 | 99.93 | 7.20E+00 | 1.47E+00 | 6.01E+02 | 9.99E+01 |
| m | 6 | 87.57 | 1.99E+02 | 77.63 | | | 1.99E+02 | 7.76E+01 |
| m | 7 | 92.27 | 3.06E+02 | 81.97 | 1.38E+02 | 1.72E+01 | 1.69E+02 | 8.37E+01 |
| | 8 | 99.81 | 7.73E+01 | 73.61 | | | 7.73E+01 | 7.36E+01 |
| | 9 | 185.97 | 2.46E+02 | 95.28 | 5.22E+01 | 7.59E+00 | 1.94E+02 | 9.56E+01 |
| | 10 | 209.39 | 1.51E+02 | 84.84 | | | 1.51E+02 | 8.48E+01 |
| M | 11 | 238.54 | 9.02E+02 | 73.93 | 2.13E+01 | 6.33E+00 | 8.81E+02 | 7.42E+01 |
| m | 12 | 241.74 | 1.97E+02 | 75.43 | | | 1.97E+02 | 7.54E+01 |
| | 13 | 269.80 | 1.14E+02 | 58.00 | 1.23E+00 | 4.98E+00 | 1.12E+02 | 5.82E+01 |
| | 14 | 295.25 | 2.62E+02 | 85.95 | | | 2.62E+02 | 8.60E+01 |
| | 15 | 328.00 | 4.99E+01 | 50.54 | | | 4.99E+01 | 5.05E+01 |
| | 16 | 338.17 | 1.62E+02 | 52.76 | | | 1.62E+02 | 5.28E+01 |
| | 17 | 351.79 | 4.77E+02 | 73.76 | 5.79E+00 | 4.49E+00 | 4.71E+02 | 7.39E+01 |
| | 18 | 415.44 | 3.43E+01 | 40.39 | | | 3.43E+01 | 4.04E+01 |
| M | 19 | 462.92 | 6.83E+01 | 39.09 | | | 6.83E+01 | 3.91E+01 |
| m | 20 | 466.18 | 2.98E+01 | 39.04 | | | 2.98E+01 | 3.90E+01 |
| | 21 | 478.87 | 2.52E+01 | 30.51 | | | 2.52E+01 | 3.05E+01 |
| | 22 | 511.29 | 1.63E+02 | 52.14 | 7.28E+01 | 5.30E+00 | 8.99E+01 | 5.24E+01 |
| | 23 | 583.26 | 2.47E+02 | 59.56 | 2.72E+00 | 3.05E+00 | 2.44E+02 | 5.96E+01 |
| | 24 | 598.49 | 1.97E+01 | 24.53 | | | 1.97E+01 | 2.45E+01 |
| | 25 | 609.60 | 3.93E+02 | 61.56 | 6.35E+00 | 4.02E+00 | 3.87E+02 | 6.17E+01 |
| | 26 | 661.86 | 1.01E+02 | 50.53 | | | 1.01E+02 | 5.05E+01 |
| | 27 | 727.46 | 8.46E+01 | 42.22 | | | 8.46E+01 | 4.22E+01 |
| | 28 | 769.70 | 5.35E+01 | 50.38 | | | 5.35E+01 | 5.04E+01 |
| M | 29 | 795.19 | 4.22E+01 | 22.69 | | | 4.22E+01 | 2.27E+01 |
| m | 30 | 803.14 | 1.57E+01 | 20.27 | | | 1.57E+01 | 2.03E+01 |
| m | 31 | 806.56 | 2.21E+01 | 23.53 | | | 2.21E+01 | 2.35E+01 |
| | 32 | 825.01 | 2.06E+01 | 21.56 | | | 2.06E+01 | 2.16E+01 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 33 | 833.43 | 4.17E+01 | 27.44 | | | 4.17E+01 | 2.74E+01 |
| | 34 | 841.33 | 2.72E+01 | 29.57 | | | 2.72E+01 | 2.96E+01 |
| | 35 | 860.69 | 5.61E+01 | 35.44 | | | 5.61E+01 | 3.54E+01 |
| | 36 | 892.45 | 3.15E+01 | 24.62 | | | 3.15E+01 | 2.46E+01 |
| | 37 | 911.57 | 1.65E+02 | 46.11 | 5.31E+00 | 3.00E+00 | 1.60E+02 | 4.62E+01 |
| M | 38 | 965.10 | 5.19E+01 | 26.56 | | | 5.19E+01 | 2.66E+01 |
| m | 39 | 969.35 | 1.21E+02 | 30.61 | | | 1.21E+02 | 3.06E+01 |
| | 40 | 983.15 | 1.60E+01 | 17.00 | | | 1.60E+01 | 1.70E+01 |
| | 41 | 1059.15 | 1.92E+01 | 17.18 | | | 1.92E+01 | 1.72E+01 |
| | 42 | 1064.68 | 2.35E+01 | 23.15 | | | 2.35E+01 | 2.32E+01 |
| | 43 | 1121.08 | 8.67E+01 | 39.95 | | | 8.67E+01 | 3.99E+01 |
| | 44 | 1164.74 | 2.14E+01 | 26.23 | | | 2.14E+01 | 2.62E+01 |
| | 45 | 1281.63 | 4.69E+01 | 36.11 | | | 4.69E+01 | 3.61E+01 |
| | 46 | 1377.68 | 2.52E+01 | 19.14 | | | 2.52E+01 | 1.91E+01 |
| M | 47 | 1402.74 | 1.57E+01 | 18.19 | | | 1.57E+01 | 1.82E+01 |
| m | 48 | 1407.75 | 2.11E+01 | 19.47 | | | 2.11E+01 | 1.95E+01 |
| | 49 | 1445.39 | 1.98E+01 | 13.27 | | | 1.98E+01 | 1.33E+01 |
| M | 50 | 1461.37 | 8.66E+02 | 61.01 | 8.09E+00 | 2.23E+00 | 8.58E+02 | 6.11E+01 |
| m | 51 | 1466.02 | 2.44E+01 | 28.33 | | | 2.44E+01 | 2.83E+01 |
| m | 52 | 1473.96 | 9.81E+00 | 18.06 | | | 9.81E+00 | 1.81E+01 |
| | 53 | 1505.81 | 3.80E+01 | 40.15 | | | 3.80E+01 | 4.01E+01 |
| | 54 | 1543.94 | 7.67E+00 | 8.54 | | | 7.67E+00 | 8.54E+00 |
| | 55 | 1702.20 | 9.72E+00 | 11.79 | | | 9.72E+00 | 1.18E+01 |
| | 56 | 1765.05 | 7.40E+01 | 22.74 | | | 7.40E+01 | 2.27E+01 |
| | 57 | 1838.29 | 8.00E+00 | 5.66 | | | 8.00E+00 | 5.66E+00 |
| M | 58 | 1881.09 | 7.40E+00 | 0.71 | | | 7.40E+00 | 7.07E-01 |
| m | 59 | 1884.97 | 8.62E+00 | 10.79 | | | 8.62E+00 | 1.08E+01 |
| m | 60 | 1889.73 | 9.49E+00 | 10.00 | | | 9.49E+00 | 1.00E+01 |
| | 61 | 1925.58 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| | 62 | 1945.47 | 5.25E+00 | 7.07 | | | 5.25E+00 | 7.07E+00 |
| | 63 | 1963.00 | 1.40E+01 | 7.48 | | | 1.40E+01 | 7.48E+00 |
| | 64 | 1971.86 | 7.00E+00 | 5.29 | | | 7.00E+00 | 5.29E+00 |
| M | 65 | 2101.92 | 5.92E+00 | 6.04 | | | 5.92E+00 | 6.04E+00 |
| m | 66 | 2105.42 | 1.87E+01 | 9.41 | | | 1.87E+01 | 9.41E+00 |
| | 67 | 2203.99 | 1.68E+01 | 16.59 | | | 1.68E+01 | 1.66E+01 |
| | 68 | 2265.18 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| | 69 | 2313.11 | 4.75E+00 | 6.02 | | | 4.75E+00 | 6.02E+00 |
| | 70 | 2338.38 | 6.69E+00 | 6.40 | | | 6.69E+00 | 6.40E+00 |
| | 71 | 2370.82 | 1.40E+01 | 7.48 | | | 1.40E+01 | 7.48E+00 |
| | 72 | 2615.12 | 1.01E+02 | 20.79 | 5.63E+00 | 1.38E+00 | 9.50E+01 | 2.08E+01 |

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

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.952 | 1460.81 | * | 10.67 | 1.79E+01 | 2.02E+00 |
| CD-109 | 0.966 | 88.03 | * | 3.72 | 2.52E+00 | 1.02E+00 |
| SN-126 | 1.000 | 87.57 | * | 37.00 | 2.19E-01 | 8.76E-02 |
| CS-137 | 0.993 | 661.65 | * | 85.12 | 1.47E-01 | 7.53E-02 |
| TL-208 | 0.981 | 583.14 | * | 30.22 | 9.03E-01 | 2.39E-01 |
| | | 860.37 | * | 4.48 | 1.89E+00 | 1.20E+00 |
| | | 2614.66 | * | 35.85 | 8.93E-01 | 2.16E-01 |
| PB-210 | 1.000 | 46.50 | * | 4.25 | 1.00E+00 | 7.05E-01 |
| BI-212 | 0.753 | 727.17 | * | 11.80 | 9.50E-01 | 4.84E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.893 | 238.63 | * | 44.60 | 1.17E+00 | 1.36E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.964 | 609.31 | * | 46.30 | 9.66E-01 | 1.84E-01 |
| | | 1120.29 | * | 15.10 | 1.05E+00 | 4.94E-01 |
| | | 1764.49 | * | 15.80 | 1.19E+00 | 3.79E-01 |
| | | 2204.22 | * | 4.98 | 1.01E+00 | 9.98E-01 |
| PB-214 | 0.998 | 295.21 | * | 19.19 | 9.25E-01 | 3.13E-01 |
| | | 351.92 | * | 37.19 | 9.70E-01 | 1.73E-01 |
| RA-224 | 0.911 | 240.98 | * | 3.95 | 2.97E+00 | 1.16E+00 |
| RA-226 | 0.991 | 186.21 | * | 3.28 | 3.04E+00 | 5.76E+00 |
| AC-228 | 0.977 | 338.32 | * | 11.40 | 1.06E+00 | 3.56E-01 |
| | | 911.07 | * | 27.70 | 9.08E-01 | 2.73E-01 |
| | | 969.11 | * | 16.60 | 1.20E+00 | 3.20E-01 |
| TH-234 | 1.000 | 63.29 | * | 3.80 | 9.99E-01 | 1.01E+00 |
| AM-243 | 0.998 | 74.67 | * | 66.00 | 2.28E-01 | 6.05E-02 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 1:08:24PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| M | 1 | 43.52 | 1.06598E-02 | 41.06 | | |
| m | 5 | 77.26 | 1.67030E-01 | 8.31 | | |
| m | 7 | 92.27 | 4.68405E-02 | 24.83 | Sum | |
| | 8 | 99.81 | 2.14723E-02 | 47.62 | D-Esc | |
| | 10 | 209.39 | 4.20496E-02 | 28.02 | Tol. | GA-67<br>CM-243 |
| | 13 | 269.80 | 3.12326E-02 | 25.89 | | |
| | 15 | 328.00 | 1.38627E-02 | 50.64 | Tol. | LA-140 |
| | 18 | 415.44 | 9.51759E-03 | 58.94 | Sum | |
| M | 19 | 462.92 | 1.89733E-02 | 28.61 | Tol. | SB-125 |
| m | 20 | 466.18 | 8.28746E-03 | 65.42 | | |
| | 21 | 478.87 | 6.99159E-03 | 60.61 | | |
| | 22 | 511.29 | 2.49606E-02 | 29.16 | | |
| | 24 | 598.49 | 5.47980E-03 | 62.17 | | |
| | 28 | 769.70 | 1.48531E-02 | 47.11 | Sum | |
| M | 29 | 795.19 | 1.17312E-02 | 26.87 | Sum | |
| m | 30 | 803.14 | 4.34796E-03 | 64.76 | | |
| m | 31 | 806.56 | 6.12907E-03 | 53.32 | | |
| | 32 | 825.01 | 5.73485E-03 | 52.22 | Sum | |
| | 33 | 833.43 | 1.15789E-02 | 32.92 | | |
| | 34 | 841.33 | 7.56865E-03 | 54.27 | | |
| | 36 | 892.45 | 8.75185E-03 | 39.07 | | |
| M | 38 | 965.10 | 1.44217E-02 | 25.58 | Sum | |
| | 40 | 983.15 | 4.44444E-03 | 53.13 | | |
| | 41 | 1059.15 | 5.32986E-03 | 44.76 | | |
| | 42 | 1064.68 | 6.54122E-03 | 49.16 | Sum | |
| | 44 | 1164.74 | 5.93750E-03 | 61.36 | | |
| | 45 | 1281.63 | 1.30256E-02 | 38.50 | | |
| | 46 | 1377.68 | 7.00181E-03 | 37.96 | | |
| M | 47 | 1402.74 | 4.35303E-03 | 58.05 | | |
| m | 48 | 1407.75 | 5.85058E-03 | 46.22 | Tol. | EU-152 |
| | 49 | 1445.39 | 5.50595E-03 | 33.47 | | |
| m | 51 | 1466.02 | 6.77478E-03 | 58.08 | | |
| m | 52 | 1473.96 | 2.72637E-03 | 91.98 | | |
| | 53 | 1505.81 | 1.05506E-02 | 52.85 | | |
| | 54 | 1543.94 | 2.12963E-03 | 55.72 | | |
| | 55 | 1702.20 | 2.69965E-03 | 60.66 | Sum | |
| | 57 | 1838.29 | 2.22222E-03 | 35.36 | | |
| M | 58 | 1881.09 | 2.05535E-03 | 4.78 | Sum | |
| m | 59 | 1884.97 | 2.39463E-03 | 62.60 | | |
| m | 60 | 1889.73 | 2.63571E-03 | 52.69 | | |
| | 61 | 1925.58 | 2.50000E-03 | 33.33 | | |
| | 62 | 1945.47 | 1.45833E-03 | 67.34 | | |
| | 63 | 1963.00 | 3.88889E-03 | 26.73 | | |
| | 64 | 1971.86 | 1.94444E-03 | 37.80 | | |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| M | 65 | 2101.92 | 1.64515E-03 | 51.00 | | |
| m | 66 | 2105.42 | 5.19573E-03 | 25.15 | | |
| | 68 | 2265.18 | 2.77778E-03 | 31.62 | | |
| | 69 | 2313.11 | 1.31944E-03 | 63.38 | | |
| | 70 | 2338.38 | 1.85764E-03 | 47.87 | | |
| | 71 | 2370.82 | 3.88889E-03 | 26.73 | | |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.95 | 1460.81 | * | 10.67 | 1.79E+01 | 2.02E+00 |
| CD-109 | 0.96 | 88.03 | * | 3.72 | 2.52E+00 | 1.02E+00 |
| SN-126 | 1.00 | 87.57 | * | 37.00 | 2.19E-01 | 8.76E-02 |
| CS-137 | 0.99 | 661.65 | * | 85.12 | 1.47E-01 | 7.53E-02 |
| TL-208 | 0.98 | 583.14 | * | 30.22 | 9.03E-01 | 2.39E-01 |
| | | 860.37 | * | 4.48 | 1.89E+00 | 1.20E+00 |
| | | 2614.66 | * | 35.85 | 8.93E-01 | 2.16E-01 |
| PB-210 | 1.00 | 46.50 | * | 4.25 | 1.00E+00 | 7.05E-01 |
| BI-212 | 0.75 | 727.17 | * | 11.80 | 9.50E-01 | 4.84E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.89 | 238.63 | * | 44.60 | 1.17E+00 | 1.36E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.96 | 609.31 | * | 46.30 | 9.66E-01 | 1.84E-01 |
| | | 1120.29 | * | 15.10 | 1.05E+00 | 4.94E-01 |
| | | 1764.49 | * | 15.80 | 1.19E+00 | 3.79E-01 |
| | | 2204.22 | * | 4.98 | 1.01E+00 | 9.98E-01 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 9.25E-01 | 3.13E-01 |
| | | 351.92 | * | 37.19 | 9.70E-01 | 1.73E-01 |
| RA-224 | 0.91 | 240.98 | * | 3.95 | 2.97E+00 | 1.16E+00 |
| RA-226 | 0.99 | 186.21 | * | 3.28 | 3.04E+00 | 5.76E+00 |
| AC-228 | 0.97 | 338.32 | * | 11.40 | 1.06E+00 | 3.56E-01 |
| | | 911.07 | * | 27.70 | 9.08E-01 | 2.73E-01 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| AC-228 | 0.97 | 969.11 | * | 16.60 | 1.20E+00 | 3.20E-01 |
| TH-234 | 1.00 | 63.29 | * | 3.80 | 9.99E-01 | 1.01E+00 |
| AM-243 | 0.99 | 74.67 | * | 66.00 | 2.28E-01 | 6.05E-02 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.952 | 1.79E+01 | 2.02E+00 | |
| ? | CD-109 | 0.966 | 2.52E+00 | 1.02E+00 | |
| ? | SN-126 | 1.000 | 2.19E-01 | 8.76E-02 | |
| | CS-137 | 0.993 | 1.47E-01 | 7.53E-02 | |
| | TL-208 | 0.981 | 9.15E-01 | 1.59E-01 | |
| | PB-210 | 1.000 | 1.00E+00 | 7.05E-01 | |
| | BI-212 | 0.753 | 9.50E-01 | 4.84E-01 | |
| | PB-212 | 0.893 | 1.17E+00 | 1.36E-01 | |
| | BI-214 | 0.964 | 1.01E+00 | 1.55E-01 | |
| | PB-214 | 0.998 | 9.59E-01 | 1.52E-01 | |
| | RA-224 | 0.911 | 2.97E+00 | 1.16E+00 | |
| | RA-226 | 0.991 | 3.04E+00 | 5.76E+00 | |
| | AC-228 | 0.977 | 1.04E+00 | 1.80E-01 | |
| | TH-234 | 1.000 | 9.99E-01 | 1.01E+00 | |
| | AM-243 | 0.998 | 2.28E-01 | 6.05E-02 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 1:08:24PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| M | 1 | 43.52 | 1.06598E-02 | 41.06 | | |
| m | 5 | 77.26 | 1.67030E-01 | 8.31 | | |
| m | 7 | 92.27 | 4.68405E-02 | 24.83 | Sum | |
| | 8 | 99.81 | 2.14723E-02 | 47.62 | D-Esc | |
| | 10 | 209.39 | 4.20496E-02 | 28.02 | Tol. | GA-67 |
| | | | | | | CM-243 |
| | 13 | 269.80 | 3.12326E-02 | 25.89 | | |
| | 15 | 328.00 | 1.38627E-02 | 50.64 | Tol. | LA-140 |
| | 18 | 415.44 | 9.51759E-03 | 58.94 | Sum | |
| M | 19 | 462.92 | 1.89733E-02 | 28.61 | Tol. | SB-125 |
| m | 20 | 466.18 | 8.28746E-03 | 65.42 | | |
| | 21 | 478.87 | 6.99159E-03 | 60.61 | | |
| | 22 | 511.29 | 2.49606E-02 | 29.16 | | |
| | 24 | 598.49 | 5.47980E-03 | 62.17 | | |
| | 28 | 769.70 | 1.48531E-02 | 47.11 | Sum | |
| M | 29 | 795.19 | 1.17312E-02 | 26.87 | Sum | |
| m | 30 | 803.14 | 4.34796E-03 | 64.76 | | |
| m | 31 | 806.56 | 6.12907E-03 | 53.32 | | |
| | 32 | 825.01 | 5.73485E-03 | 52.22 | Sum | |
| | 33 | 833.43 | 1.15789E-02 | 32.92 | | |
| | 34 | 841.33 | 7.56865E-03 | 54.27 | | |
| | 36 | 892.45 | 8.75185E-03 | 39.07 | | |
| M | 38 | 965.10 | 1.44217E-02 | 25.58 | Sum | |
| | 40 | 983.15 | 4.44444E-03 | 53.13 | | |
| | 41 | 1059.15 | 5.32986E-03 | 44.76 | | |
| | 42 | 1064.68 | 6.54122E-03 | 49.16 | Sum | |
| | 44 | 1164.74 | 5.93750E-03 | 61.36 | | |
| | 45 | 1281.63 | 1.30256E-02 | 38.50 | | |
| | 46 | 1377.68 | 7.00181E-03 | 37.96 | | |
| M | 47 | 1402.74 | 4.35303E-03 | 58.05 | | |
| m | 48 | 1407.75 | 5.85058E-03 | 46.22 | Tol. | EU-152 |
| | 49 | 1445.39 | 5.50595E-03 | 33.47 | | |
| m | 51 | 1466.02 | 6.77478E-03 | 58.08 | | |
| m | 52 | 1473.96 | 2.72637E-03 | 91.98 | | |
| | 53 | 1505.81 | 1.05506E-02 | 52.85 | | |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 54 | 1543.94 | 2.12963E-03 | 55.72 | | |
| | 55 | 1702.20 | 2.69965E-03 | 60.66 | Sum | |
| | 57 | 1838.29 | 2.22222E-03 | 35.36 | | |
| M | 58 | 1881.09 | 2.05535E-03 | 4.78 | Sum | |
| m | 59 | 1884.97 | 2.39463E-03 | 62.60 | | |
| m | 60 | 1889.73 | 2.63571E-03 | 52.69 | | |
| | 61 | 1925.58 | 2.50000E-03 | 33.33 | | |
| | 62 | 1945.47 | 1.45833E-03 | 67.34 | | |
| | 63 | 1963.00 | 3.88889E-03 | 26.73 | | |
| | 64 | 1971.86 | 1.94444E-03 | 37.80 | | |
| M | 65 | 2101.92 | 1.64515E-03 | 51.00 | | |
| m | 66 | 2105.42 | 5.19573E-03 | 25.15 | | |
| | 68 | 2265.18 | 2.77778E-03 | 31.62 | | |
| | 69 | 2313.11 | 1.31944E-03 | 63.38 | | |
| | 70 | 2338.38 | 1.85764E-03 | 47.87 | | |
| | 71 | 2370.82 | 3.88889E-03 | 26.73 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | | 10.42 | -2.60E-01 | 1.79E+00 | 1.79E+00 |
| + | NA-22 | 1274.54 | | 99.94 | 6.76E-03 | 6.97E-02 | 6.97E-02 |
| + | @ NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | AL-26 | 1808.65 | | 99.76 | 4.55E-03 | 4.12E-02 | 4.12E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.79E+01 | 1.36E+00 | 1.36E+00 |
| + | @ AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | TI-44 | 67.88 | | 94.40 | 2.28E-02 | 5.34E-02 | 5.34E-02 |
| | | 78.34 | | 96.00 | 1.54E-01 | | 7.12E-02 |
| + | SC-46 | 889.25 | | 99.98 | 2.46E-03 | 1.47E-01 | 1.47E-01 |
| | | 1120.51 | | 99.99 | 2.81E-01 | | 2.27E-01 |
| + | V-48 | 983.52 | | 99.98 | -8.63E-01 | 4.49E+00 | 4.49E+00 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | V-48 | 1312.10 | 97.50 | 2.36E-01 | 4.49E+00 | 4.63E+00 |
| + | CR-51 | 320.08 | 9.83 | 2.00E+00 | 6.30E+00 | 6.30E+00 |
| + | MN-54 | 834.83 | 99.97 | -8.01E-03 | 7.48E-02 | 7.48E-02 |
| + | CO-56 | 846.75 | 99.96 | 3.57E-03 | 1.29E-01 | 1.33E-01 |
| | | 1037.75 | 14.03 | 2.61E-02 | | 1.01E+00 |
| | | 1238.25 | 67.00 | 2.32E-01 | | 3.36E-01 |
| | | 1771.40 | 15.51 | 5.92E-02 | | 6.87E-01 |
| | | 2598.48 | 16.90 | 0.00E+00 | | 1.29E-01 |
| + | CO-57 | 122.06 | 85.51 | 1.23E-02 | 6.31E-02 | 6.31E-02 |
| | | 136.48 | 10.60 | 2.15E-01 | | 5.28E-01 |
| + | CO-58 | 810.76 | 99.40 | 0.00E+00 | 1.45E-01 | 1.45E-01 |
| + | FE-59 | 1099.22 | 56.50 | -5.03E-03 | 5.57E-01 | 5.57E-01 |
| | | 1291.56 | 43.20 | 1.76E-01 | | 6.75E-01 |
| + | CO-60 | 1173.22 | 100.00 | -1.20E-02 | 5.51E-02 | 7.56E-02 |
| | | 1332.49 | 100.00 | 5.40E-04 | | 5.51E-02 |
| + | ZN-65 | 1115.52 | 50.75 | -3.70E-02 | 1.62E-01 | 1.62E-01 |
| + | GA-67 | 93.31 | 35.70 | 5.09E+08 | 2.38E+08 | 2.38E+08 |
| | | 208.95 | 2.24 | 3.89E+09 | | 3.30E+09 |
| | | 300.22 | 16.00 | -4.80E+07 | | 5.07E+08 |
| + | SE-75 | 121.11 | 16.70 | -9.19E-02 | 1.30E-01 | 4.35E-01 |
| | | 136.00 | 59.20 | 5.29E-02 | | 1.30E-01 |
| | | 264.65 | 59.80 | -1.66E-02 | | 1.38E-01 |
| | | 279.53 | 25.20 | 3.05E-01 | | 3.86E-01 |
| | | 400.65 | 11.40 | 3.03E-02 | | 7.78E-01 |
| + | RB-82 | 776.52 | 13.00 | 1.92E-01 | 6.68E+00 | 6.68E+00 |
| + | RB-83 | 520.41 | 46.00 | 1.45E-02 | 2.56E-01 | 2.56E-01 |
| | | 529.64 | 30.30 | -1.14E-01 | | 3.57E-01 |
| | | 552.65 | 16.40 | -6.15E-01 | | 6.41E-01 |
| + | KR-85 | 513.99 | 0.43 | 2.56E+01 | 1.79E+01 | 1.79E+01 |
| + | SR-85 | 513.99 | 99.27 | 3.18E-01 | 2.22E-01 | 2.22E-01 |
| + | Y-88 | 898.02 | 93.40 | -2.33E-02 | 6.59E-02 | 1.20E-01 |
| | | 1836.01 | 99.38 | 2.51E-03 | | 6.59E-02 |
| + | MO-93 | 263.06 | 56.72 | 1.23E-02 | 4.78E-02 | 8.36E-02 |
| | | 684.67 | 99.68 | -9.68E-03 | | 5.23E-02 |
| | | 1477.11 | 99.08 | 4.61E-03 | | 4.78E-02 |
| + | NB-93M | 16.57 | 9.43 | -3.16E-01 | 4.81E-01 | 4.81E-01 |
| + | NB-94 | 702.63 | 100.00 | 3.03E-02 | 5.66E-02 | 6.47E-02 |
| | | 871.10 | 100.00 | 7.01E-03 | | 5.66E-02 |
| + | NB-95 | 765.79 | 99.81 | -3.98E-02 | 4.93E-01 | 4.93E-01 |
| + | NB-95M | 235.69 | 25.00 | -2.90E+08 | 4.28E+07 | 4.28E+07 |
| + | ZR-95 | 724.18 | 43.70 | 4.73E-02 | 2.97E-01 | 4.42E-01 |
| | | 756.72 | 55.30 | -8.00E-02 | | 2.97E-01 |
| + | MO-99 | 181.06 | 6.20 | 4.25E+09 | 3.56E+10 | 5.07E+10 |
| | | 739.58 | 12.80 | 1.38E+10 | | 3.56E+10 |
| | | 778.00 | 4.50 | 0.00E+00 | | 9.07E+10 |
| + | RU-103 | 497.08 | 89.00 | -4.16E-02 | 3.18E-01 | 3.18E-01 |
| + | RU-106 | 621.84 | 9.80 | -1.88E-01 | 6.66E-01 | 6.66E-01 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | AG-108M | 433.93 | | 89.90 | -1.32E-02 | 5.59E-02 | 5.59E-02 |
| | | 614.37 | | 90.40 | 8.74E-03 | | 7.24E-02 |
| | | 722.95 | | 90.50 | -3.41E-04 | | 5.99E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 2.52E+00 | 3.26E+00 | 3.26E+00 |
| + | AG-110M | 657.75 | | 93.14 | -6.18E-03 | 9.42E-02 | 9.42E-02 |
| | | 677.61 | | 10.53 | -9.19E-02 | | 7.16E-01 |
| | | 706.67 | | 16.46 | -7.44E-02 | | 4.96E-01 |
| | | 763.93 | | 21.98 | 1.42E-02 | | 3.63E-01 |
| | | 884.67 | | 71.63 | 2.78E-02 | | 1.07E-01 |
| | | 1384.27 | | 23.94 | -6.43E-03 | | 3.00E-01 |
| + | CD-113M | 263.70 | | 0.02 | -2.45E+00 | 2.01E+02 | 2.01E+02 |
| + | SN-113 | 255.12 | | 1.93 | -1.87E+00 | 1.41E-01 | 3.74E+00 |
| | | 391.69 | | 64.90 | 2.11E-02 | | 1.41E-01 |
| + | TE123M | 159.00 | | 84.10 | -8.66E-06 | 9.02E-02 | 9.02E-02 |
| + | SB-124 | 602.71 | | 97.87 | 1.90E-02 | 1.75E-01 | 1.75E-01 |
| | | 645.85 | | 7.26 | 3.80E-01 | | 2.37E+00 |
| | | 722.78 | | 11.10 | -8.70E-03 | | 1.53E+00 |
| | | 1691.02 | | 49.00 | -4.35E-02 | | 2.51E-01 |
| + | I-125 | 35.49 | | 6.49 | 3.63E-01 | 2.28E+00 | 2.28E+00 |
| + | SB-125 | 176.33 | | 6.89 | -7.67E-02 | 2.01E-01 | 6.57E-01 |
| | | 427.89 | | 29.33 | 1.29E-01 | | 2.01E-01 |
| | | 463.38 | | 10.35 | 4.85E-01 | | 6.36E-01 |
| | | 600.56 | | 17.80 | 3.55E-02 | | 3.57E-01 |
| | | 635.90 | | 11.32 | 4.05E-02 | | 4.89E-01 |
| + | SB-126 | 414.70 | | 83.30 | 2.66E+00 | 1.49E+01 | 1.69E+01 |
| | | 666.33 | | 99.60 | 3.48E+00 | | 1.71E+01 |
| | | 695.00 | | 99.60 | 3.68E+00 | | 1.49E+01 |
| | | 720.50 | | 53.80 | -8.49E+00 | | 2.26E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 2.19E-01 | 2.83E-01 | 2.83E-01 |
| + | SB-127 | 473.00 | | 25.00 | 9.85E+05 | 8.32E+06 | 1.13E+07 |
| | | 685.20 | | 35.70 | -1.54E+06 | | 8.32E+06 |
| | | 783.80 | | 14.70 | -7.74E+05 | | 2.29E+07 |
| + | I-129 | 29.78 | | 57.00 | -4.13E-02 | 8.80E-02 | 8.80E-02 |
| | | 33.60 | | 13.20 | 7.41E-05 | | 3.57E-01 |
| | | 39.58 | | 7.52 | 2.36E-02 | | 5.88E-01 |
| + | I-131 | 284.30 | | 6.05 | -4.51E+02 | 3.21E+02 | 4.21E+03 |
| | | 364.48 | | 81.20 | 3.85E+01 | | 3.21E+02 |
| | | 636.97 | | 7.26 | -1.86E+02 | | 3.68E+03 |
| | | 722.89 | | 1.80 | -8.92E+01 | | 1.57E+04 |
| + | TE-132 | 49.72 | | 13.10 | -8.71E+08 | 7.58E+07 | 5.14E+08 |
| | | 228.16 | | 88.00 | -2.28E+06 | | 7.58E+07 |
| + | BA-133 | 81.00 | | 33.00 | -5.33E-01 | 1.16E-01 | 1.56E-01 |
| | | 302.84 | | 17.80 | -4.66E-02 | | 3.11E-01 |
| | | 356.01 | | 60.00 | 2.94E-03 | | 1.16E-01 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -2.28E+05 | 6.66E+04 | 6.66E+04 |
| + | CS-134 | 563.23 | | 8.38 | -1.34E-01 | 7.01E-02 | 6.67E-01 |
| | | 569.32 | | 15.43 | -1.05E-01 | | 3.46E-01 |
| | | 604.70 | | 97.60 | 6.67E-03 | | 7.01E-02 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | | CS-134 | 795.84 | | 85.40 | 4.79E-02 | 7.01E-02 | 8.44E-02 |
| | | | 801.93 | | 8.73 | -3.79E-01 | | 6.89E-01 |
| + | | CS-135 | 268.24 | | 16.00 | 4.50E-01 | 3.47E-01 | 3.47E-01 |
| + | @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | | CS-136 | 153.22 | | 7.46 | 6.29E+01 | 9.76E+00 | 1.13E+02 |
| | | | 163.89 | | 4.61 | -8.20E+01 | | 1.69E+02 |
| | | | 176.55 | | 13.56 | -6.80E+00 | | 5.83E+01 |
| | | | 273.65 | | 12.66 | -3.08E+01 | | 8.09E+01 |
| | | | 340.57 | | 48.50 | 2.70E+00 | | 2.55E+01 |
| | | | 818.50 | | 99.70 | 1.78E-01 | | 9.76E+00 |
| | | | 1048.07 | | 79.60 | 3.73E+00 | | 1.52E+01 |
| | | | 1235.34 | | 19.70 | 1.30E+01 | | 8.89E+01 |
| + | | CS-137 | 661.65 | * | 85.12 | 1.47E-01 | 1.15E-01 | 1.15E-01 |
| + | | LA-138 | 788.74 | | 34.00 | 7.22E-02 | 7.10E-02 | 1.71E-01 |
| | | | 1435.80 | | 66.00 | -5.62E-03 | | 7.10E-02 |
| + | | CE-139 | 165.85 | | 80.35 | 2.51E-02 | 8.76E-02 | 8.76E-02 |
| + | | BA-140 | 162.64 | | 6.70 | -2.80E+00 | 4.30E+01 | 1.37E+02 |
| | | | 304.84 | | 4.50 | -2.17E+02 | | 2.31E+02 |
| | | | 423.70 | | 3.20 | -1.56E+01 | | 3.59E+02 |
| | | | 437.55 | | 2.00 | 1.18E+02 | | 5.55E+02 |
| | | | 537.32 | | 25.00 | -7.57E+00 | | 4.30E+01 |
| + | | LA-140 | 328.77 | | 20.50 | 4.00E+01 | 1.27E+01 | 6.17E+01 |
| | | | 487.03 | | 45.50 | 6.99E+00 | | 2.46E+01 |
| | | | 815.85 | | 23.50 | 1.40E+01 | | 4.97E+01 |
| | | | 1596.49 | | 95.49 | -1.86E+00 | | 1.27E+01 |
| + | | CE-141 | 145.44 | | 48.40 | 1.01E-01 | 7.46E-01 | 7.46E-01 |
| + | @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | | CE-144 | 133.54 | | 10.80 | -5.60E-01 | 4.86E-01 | 4.86E-01 |
| + | | PM-144 | 476.78 | | 42.00 | 4.83E-03 | 6.68E-02 | 1.53E-01 |
| | | | 618.01 | | 98.60 | -1.86E-02 | | 6.68E-02 |
| | | | 696.49 | | 99.49 | 9.45E-03 | | 7.06E-02 |
| + | | PM-145 | 36.85 | | 21.70 | 3.78E-02 | 1.16E-01 | 2.14E-01 |
| | | | 37.36 | | 39.70 | 1.93E-02 | | 1.16E-01 |
| | | | 42.30 | | 15.10 | 1.58E-02 | | 2.95E-01 |
| | | | 72.40 | | 2.31 | -2.79E+00 | | 2.61E+00 |
| + | | PM-146 | 453.90 | | 39.94 | -1.86E-02 | 1.23E-01 | 1.23E-01 |
| | | | 735.90 | | 14.01 | -4.85E-02 | | 4.22E-01 |
| | | | 747.13 | | 13.10 | -1.51E-01 | | 4.51E-01 |
| + | | ND-147 | 91.11 | | 28.90 | 2.05E+02 | 1.11E+02 | 1.11E+02 |
| | | | 531.02 | | 13.10 | 1.70E+01 | | 2.02E+02 |
| + | | PM-149 | 285.90 | | 3.10 | 1.09E+13 | 5.19E+13 | 5.19E+13 |
| + | | EU-152 | 121.78 | | 20.50 | -4.28E-02 | 2.03E-01 | 2.03E-01 |
| | | | 244.69 | | 5.40 | -7.25E-01 | | 9.06E-01 |
| | | | 344.27 | | 19.13 | -1.86E-02 | | 2.61E-01 |
| | | | 778.89 | | 9.20 | -8.52E-02 | | 6.19E-01 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | EU-152 | 964.01 | 10.40 | -1.44E+00 | 2.03E-01 | 8.31E-01 |
| | | 1085.78 | 7.22 | 1.21E-01 | | 8.88E-01 |
| | | 1112.02 | 9.60 | 8.76E-03 | | 6.80E-01 |
| | | 1407.95 | 14.94 | 1.65E-01 | | 4.56E-01 |
| + | GD-153 | 97.43 | 31.30 | -2.99E-01 | 1.88E-01 | 1.88E-01 |
| | | 103.18 | 22.20 | 6.05E-02 | | 2.57E-01 |
| + | EU-154 | 123.07 | 40.50 | 9.40E-03 | 1.06E-01 | 1.06E-01 |
| | | 723.30 | 19.70 | -1.60E-03 | | 2.81E-01 |
| | | 873.19 | 11.50 | -5.15E-02 | | 4.86E-01 |
| | | 996.32 | 10.30 | -1.08E-01 | | 5.77E-01 |
| | | 1004.76 | 17.90 | 2.89E-01 | | 3.99E-01 |
| | | 1274.45 | 35.50 | 1.81E-02 | | 1.87E-01 |
| + | EU-155 | 86.50 | 30.90 | 2.10E-02 | 1.83E-01 | 1.83E-01 |
| | | 105.30 | 20.70 | 2.19E-02 | | 2.15E-01 |
| + | EU-156 | 811.77 | 10.40 | -9.44E+00 | 4.83E+01 | 4.83E+01 |
| | | 1153.47 | 7.20 | 8.80E+01 | | 1.03E+02 |
| | | 1230.71 | 8.90 | 7.86E+00 | | 8.65E+01 |
| + | HO-166M | 184.41 | 72.60 | 1.41E-01 | 7.53E-02 | 7.53E-02 |
| | | 280.45 | 29.60 | 1.49E-01 | | 1.82E-01 |
| | | 410.94 | 11.10 | -1.35E-02 | | 4.75E-01 |
| | | 711.69 | 54.10 | 7.11E-02 | | 1.14E-01 |
| + | TM-171 | 66.72 | 0.14 | -3.54E-01 | 3.94E+01 | 3.94E+01 |
| + | HF-172 | 67.35 | 5.31 | 4.47E-01 | 4.21E-01 | 1.05E+00 |
| | | 125.81 | 11.30 | -1.84E-01 | | 4.21E-01 |
| + | LU-172 | 181.53 | 20.60 | 5.05E+02 | 3.18E+03 | 6.02E+03 |
| | | 900.72 | 29.81 | 7.88E+02 | | 6.12E+03 |
| | | 1093.66 | 62.50 | 1.67E+02 | | 3.18E+03 |
| + | LU-173 | 100.72 | 5.24 | 2.85E-01 | 3.03E-01 | 9.65E-01 |
| | | 272.11 | 21.20 | -1.28E-01 | | 3.03E-01 |
| + | HF-175 | 343.40 | 84.00 | -1.11E-02 | 1.53E-01 | 1.53E-01 |
| + | LU-176 | 88.34 | 13.30 | -2.61E-01 | 4.87E-02 | 4.19E-01 |
| | | 201.83 | 86.00 | 2.77E-03 | | 5.08E-02 |
| | | 306.78 | 94.00 | -2.67E-02 | | 4.87E-02 |
| + | HF-181 | 133.02 | 41.70 | -5.77E-01 | 3.24E-01 | 5.00E-01 |
| | | 345.85 | 17.20 | -1.88E-01 | | 1.42E+00 |
| | | 482.03 | 82.80 | 4.56E-02 | | 3.24E-01 |
| + | TA-182 | 67.75 | 41.20 | 9.50E-02 | 2.23E-01 | 2.23E-01 |
| | | 1121.30 | 34.90 | 6.04E-01 | | 5.27E-01 |
| | | 1189.05 | 16.23 | -1.34E-01 | | 7.53E-01 |
| | | 1221.41 | 26.98 | -2.25E-01 | | 4.96E-01 |
| | | 1231.02 | 11.44 | 1.20E-01 | | 1.32E+00 |
| + | IR-192 | 308.46 | 29.68 | -4.76E-02 | 2.79E-01 | 3.92E-01 |
| | | 468.07 | 48.10 | -1.91E-01 | | 2.79E-01 |
| + | HG-203 | 279.19 | 77.30 | 2.45E-01 | 3.10E-01 | 3.10E-01 |
| + | TL-204 | 374.74 | 94.11 | 7.16E-03 | 5.53E-02 | 5.53E-02 |
| | | 899.15 | 99.16 | -1.87E-02 | | 6.44E-02 |
| | | 911.74 | 91.10 | 2.82E-01 | | 1.34E-01 |
| + | BI-207 | 569.67 | 97.72 | 3.15E-03 | 5.16E-02 | 5.16E-02 |
| | | 1063.62 | 74.90 | -7.84E-03 | | 8.60E-02 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | TL-208 | 583.14 | * | 30.22 | 9.03E-01 | 1.39E-01 | 3.19E-01 |
| | | 860.37 | * | 4.48 | 1.89E+00 | | 1.87E+00 |
| | | 2614.66 | * | 35.85 | 8.93E-01 | | 1.39E-01 |
| + | BI-210M | 262.00 | | 45.00 | 2.15E-02 | 1.06E-01 | 1.06E-01 |
| | | 300.00 | | 23.00 | 3.00E-02 | | 2.50E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 1.00E+00 | 1.79E+00 | 1.79E+00 |
| + | PB-211 | 404.84 | | 2.90 | 2.67E-01 | 1.84E+00 | 1.84E+00 |
| | | 831.96 | | 2.90 | 6.65E-01 | | 2.08E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 9.50E-01 | 7.33E-01 | 7.33E-01 |
| | | 1620.62 | | 2.75 | -1.20E-01 | | 1.86E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.17E+00 | 2.00E-01 | 2.00E-01 |
| | | 300.09 | | 3.41 | 2.02E-01 | | 1.69E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 9.66E-01 | 2.02E-01 | 2.02E-01 |
| | | 1120.29 | * | 15.10 | 1.05E+00 | | 7.40E-01 |
| | | 1764.49 | * | 15.80 | 1.19E+00 | | 4.38E-01 |
| | | 2204.22 | * | 4.98 | 1.01E+00 | | 1.58E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 9.25E-01 | 2.08E-01 | 4.72E-01 |
| | | 351.92 | * | 37.19 | 9.70E-01 | | 2.08E-01 |
| + | RN-219 | 401.80 | | 6.50 | -2.29E-01 | 7.70E-01 | 7.70E-01 |
| + | RA-223 | 323.87 | | 3.88 | 2.23E-01 | 1.33E+00 | 1.33E+00 |
| + | RA-224 | 240.98 | * | 3.95 | 2.97E+00 | 2.24E+00 | 2.24E+00 |
| + | RA-225 | 40.00 | | 31.00 | -3.59E+00 | 1.45E+01 | 1.45E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 3.04E+00 | 2.40E+00 | 2.40E+00 |
| + | TH-227 | 50.10 | | 8.40 | -3.89E-01 | 4.89E-01 | 5.34E-01 |
| | | 236.00 | | 11.50 | -3.32E+00 | | 4.89E-01 |
| | | 256.20 | | 6.30 | -3.32E-01 | | 7.59E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.06E+00 | 3.77E-01 | 5.14E-01 |
| | | 911.07 | * | 27.70 | 9.08E-01 | | 3.77E-01 |
| | | 969.11 | * | 16.60 | 1.20E+00 | | 6.55E-01 |
| + | TH-230 | 48.44 | | 16.90 | 2.79E-01 | 2.92E-01 | 2.92E-01 |
| | | 62.85 | | 4.60 | 2.05E+00 | | 1.24E+00 |
| | | 67.67 | | 0.37 | 5.80E+00 | | 1.36E+01 |
| + | PA-231 | 283.67 | | 1.60 | -6.76E-01 | 2.36E+00 | 3.09E+00 |
| | | 302.67 | | 2.30 | -3.54E-01 | | 2.36E+00 |
| + | TH-231 | 25.64 | | 14.70 | -2.63E+00 | 4.49E-01 | 4.49E-01 |
| | | 84.21 | | 6.40 | -2.98E-01 | | 8.14E-01 |
| + | PA-233 | 311.98 | | 38.60 | 6.47E-01 | 1.59E+00 | 1.59E+00 |
| + | PA-234 | 131.20 | | 20.40 | 1.24E-01 | 2.18E-01 | 2.18E-01 |
| | | 733.99 | | 8.80 | -1.61E-01 | | 6.35E-01 |
| | | 946.00 | | 12.00 | 3.65E-02 | | 5.26E-01 |
| + | PA-234M | 1001.03 | | 0.92 | 4.77E-01 | 6.83E+00 | 6.83E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 9.99E-01 | 1.66E+00 | 1.66E+00 |
| + | U-235 | 143.76 | | 10.50 | 2.22E-01 | 4.17E-01 | 4.17E-01 |
| | | 163.35 | | 4.70 | -4.30E-01 | | 8.87E-01 |
| | | 205.31 | | 4.70 | -1.29E+00 | | 9.29E-01 |
| + | NP-237 | 86.50 | | 12.60 | 4.96E-02 | 4.31E-01 | 4.31E-01 |
| + | NP-239 | 106.10 | | 22.70 | 4.94E+11 | 9.42E+11 | 9.42E+11 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | NP-239 | 228.18 | | 10.70 | -6.20E+10 | 9.42E+11 | 2.06E+12 |
| | | 277.60 | | 14.10 | 1.32E+12 | | 1.91E+12 |
| + | AM-241 | 59.54 | | 35.90 | 3.08E-02 | 1.42E-01 | 1.42E-01 |
| + | AM-243 | 74.67 | * | 66.00 | 2.28E-01 | 1.42E-01 | 1.42E-01 |
| + | CM-243 | 209.75 | | 3.29 | 1.72E+00 | 3.94E-01 | 1.53E+00 |
| | | 228.14 | | 10.60 | -1.28E-02 | | 4.25E-01 |
| | | 277.60 | | 14.00 | 2.73E-01 | | 3.94E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.79E+00 | 1.79E+00 | -2.60E-01 | 8.51E-01 |
| | NA-22 | 1274.54 | | 99.94 | 6.97E-02 | 6.97E-02 | 6.76E-03 | 3.19E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 4.12E-02 | 4.12E-02 | 4.55E-03 | 1.71E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.36E+00 | 1.36E+00 | 1.79E+01 | 6.49E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 5.34E-02 | 5.34E-02 | 2.28E-02 | 2.61E-02 |
| | | 78.34 | | 96.00 | 7.12E-02 | | 1.54E-01 | 3.50E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.47E-01 | 1.47E-01 | 2.46E-03 | 6.88E-02 |
| | | 1120.51 | | 99.99 | 2.27E-01 | | 2.81E-01 | 1.08E-01 |
| | V-48 | 983.52 | | 99.98 | 4.49E+00 | 4.49E+00 | -8.63E-01 | 2.08E+00 |
| | | 1312.10 | | 97.50 | 4.63E+00 | | 2.36E-01 | 2.10E+00 |
| | CR-51 | 320.08 | | 9.83 | 6.30E+00 | 6.30E+00 | 2.00E+00 | 3.03E+00 |
| | MN-54 | 834.83 | | 99.97 | 7.48E-02 | 7.48E-02 | -8.01E-03 | 3.49E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.33E-01 | 1.29E-01 | 3.57E-03 | 6.15E-02 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | CO-56 | 1037.75 | | 14.03 | 1.01E+00 | 1.29E-01 | 2.61E-02 | 4.67E-01 |
| | | 1238.25 | | 67.00 | 3.36E-01 | | 2.32E-01 | 1.58E-01 |
| | | 1771.40 | | 15.51 | 6.87E-01 | | 5.92E-02 | 2.90E-01 |
| | | 2598.48 | | 16.90 | 1.29E-01 | | 0.00E+00 | 0.00E+00 |
| | CO-57 | 122.06 | | 85.51 | 6.31E-02 | 6.31E-02 | 1.23E-02 | 3.07E-02 |
| | | 136.48 | | 10.60 | 5.28E-01 | | 2.15E-01 | 2.57E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.45E-01 | 1.45E-01 | 0.00E+00 | 6.72E-02 |
| | FE-59 | 1099.22 | | 56.50 | 5.57E-01 | 5.57E-01 | -5.03E-03 | 2.58E-01 |
| | | 1291.56 | | 43.20 | 6.75E-01 | | 1.76E-01 | 3.08E-01 |
| | CO-60 | 1173.22 | | 100.00 | 7.56E-02 | 5.51E-02 | -1.20E-02 | 3.52E-02 |
| | | 1332.49 | | 100.00 | 5.51E-02 | | 5.40E-04 | 2.46E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 1.62E-01 | 1.62E-01 | -3.70E-02 | 7.45E-02 |
| | GA-67 | 93.31 | | 35.70 | 2.38E+08 | 2.38E+08 | 5.09E+08 | 1.17E+08 |
| | | 208.95 | | 2.24 | 3.30E+09 | | 3.89E+09 | 1.60E+09 |
| | | 300.22 | | 16.00 | 5.07E+08 | | -4.80E+07 | 2.45E+08 |
| | SE-75 | 121.11 | | 16.70 | 4.35E-01 | 1.30E-01 | -9.19E-02 | 2.12E-01 |
| | | 136.00 | | 59.20 | 1.30E-01 | | 5.29E-02 | 6.33E-02 |
| | | 264.65 | | 59.80 | 1.38E-01 | | -1.66E-02 | 6.67E-02 |
| | | 279.53 | | 25.20 | 3.86E-01 | | 3.05E-01 | 1.87E-01 |
| | | 400.65 | | 11.40 | 7.78E-01 | | 3.03E-02 | 3.71E-01 |
| | RB-82 | 776.52 | | 13.00 | 6.68E+00 | 6.68E+00 | 1.92E-01 | 3.13E+00 |
| | RB-83 | 520.41 | | 46.00 | 2.56E-01 | 2.56E-01 | 1.45E-02 | 1.21E-01 |
| | | 529.64 | | 30.30 | 3.57E-01 | | -1.14E-01 | 1.68E-01 |
| | | 552.65 | | 16.40 | 6.41E-01 | | -6.15E-01 | 3.01E-01 |
| | KR-85 | 513.99 | | 0.43 | 1.79E+01 | 1.79E+01 | 2.56E+01 | 8.62E+00 |
| | SR-85 | 513.99 | | 99.27 | 2.22E-01 | 2.22E-01 | 3.18E-01 | 1.07E-01 |
| | Y-88 | 898.02 | | 93.40 | 1.20E-01 | 6.59E-02 | -2.33E-02 | 5.58E-02 |
| | | 1836.01 | | 99.38 | 6.59E-02 | | 2.51E-03 | 2.62E-02 |
| | MO-93 | 263.06 | | 56.72 | 8.36E-02 | 4.78E-02 | 1.23E-02 | 4.03E-02 |
| | | 684.67 | | 99.68 | 5.23E-02 | | -9.68E-03 | 2.44E-02 |
| | | 1477.11 | | 99.08 | 4.78E-02 | | 4.61E-03 | 2.08E-02 |
| | NB-93M | 16.57 | | 9.43 | 4.81E-01 | 4.81E-01 | -3.16E-01 | 2.26E-01 |
| | NB-94 | 702.63 | | 100.00 | 6.47E-02 | 5.66E-02 | 3.03E-02 | 3.06E-02 |
| | | 871.10 | | 100.00 | 5.66E-02 | | 7.01E-03 | 2.62E-02 |
| | NB-95 | 765.79 | | 99.81 | 4.93E-01 | 4.93E-01 | -3.98E-02 | 2.33E-01 |
| | NB-95M | 235.69 | | 25.00 | 4.28E+07 | 4.28E+07 | -2.90E+08 | 2.08E+07 |
| | ZR-95 | 724.18 | | 43.70 | 4.42E-01 | 2.97E-01 | 4.73E-02 | 2.09E-01 |
| | | 756.72 | | 55.30 | 2.97E-01 | | -8.00E-02 | 1.39E-01 |
| | MO-99 | 181.06 | | 6.20 | 5.07E+10 | 3.56E+10 | 4.25E+09 | 2.45E+10 |
| | | 739.58 | | 12.80 | 3.56E+10 | | 1.38E+10 | 1.68E+10 |
| | | 778.00 | | 4.50 | 9.07E+10 | | 0.00E+00 | 4.23E+10 |
| | RU-103 | 497.08 | | 89.00 | 3.18E-01 | 3.18E-01 | -4.16E-02 | 1.50E-01 |
| | RU-106 | 621.84 | | 9.80 | 6.66E-01 | 6.66E-01 | -1.88E-01 | 3.14E-01 |
| | AG-108M | 433.93 | | 89.90 | 5.59E-02 | 5.59E-02 | -1.32E-02 | 2.66E-02 |
| | | 614.37 | | 90.40 | 7.24E-02 | | 8.74E-03 | 3.45E-02 |
| | | 722.95 | | 90.50 | 5.99E-02 | | -3.41E-04 | 2.80E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 3.26E+00 | 3.26E+00 | 2.52E+00 | 1.61E+00 |
| | AG-110M | 657.75 | | 93.14 | 9.42E-02 | 9.42E-02 | -6.18E-03 | 4.48E-02 |
| | | 677.61 | | 10.53 | 7.16E-01 | | -9.19E-02 | 3.37E-01 |
| | | 706.67 | | 16.46 | 4.96E-01 | | -7.44E-02 | 2.34E-01 |
| | | 763.93 | | 21.98 | 3.63E-01 | | 1.42E-02 | 1.70E-01 |
| | | 884.67 | | 71.63 | 1.07E-01 | | 2.78E-02 | 4.97E-02 |
| | | 1384.27 | | 23.94 | 3.00E-01 | | -6.43E-03 | 1.34E-01 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | CD-113M | 263.70 | | 0.02 | 2.01E+02 | 2.01E+02 | -2.45E+00 | 9.70E+01 |
| | SN-113 | 255.12 | | 1.93 | 3.74E+00 | 1.41E-01 | -1.87E+00 | 1.79E+00 |
| | | 391.69 | | 64.90 | 1.41E-01 | | 2.11E-02 | 6.74E-02 |
| | TE123M | 159.00 | | 84.10 | 9.02E-02 | 9.02E-02 | -8.66E-06 | 4.37E-02 |
| | SB-124 | 602.71 | | 97.87 | 1.75E-01 | 1.75E-01 | 1.90E-02 | 8.25E-02 |
| | | 645.85 | | 7.26 | 2.37E+00 | | 3.80E-01 | 1.11E+00 |
| | | 722.78 | | 11.10 | 1.53E+00 | | -8.70E-03 | 7.15E-01 |
| | | 1691.02 | | 49.00 | 2.51E-01 | | -4.35E-02 | 1.04E-01 |
| | I-125 | 35.49 | | 6.49 | 2.28E+00 | 2.28E+00 | 3.63E-01 | 1.10E+00 |
| | SB-125 | 176.33 | | 6.89 | 6.57E-01 | 2.01E-01 | -7.67E-02 | 3.18E-01 |
| | | 427.89 | | 29.33 | 2.01E-01 | | 1.29E-01 | 9.61E-02 |
| | | 463.38 | | 10.35 | 6.36E-01 | | 4.85E-01 | 3.05E-01 |
| | | 600.56 | | 17.80 | 3.57E-01 | | 3.55E-02 | 1.69E-01 |
| | | 635.90 | | 11.32 | 4.89E-01 | | 4.05E-02 | 2.29E-01 |
| | SB-126 | 414.70 | | 83.30 | 1.69E+01 | 1.49E+01 | 2.66E+00 | 8.07E+00 |
| | | 666.33 | | 99.60 | 1.71E+01 | | 3.48E+00 | 8.12E+00 |
| | | 695.00 | | 99.60 | 1.49E+01 | | 3.68E+00 | 7.00E+00 |
| | | 720.50 | | 53.80 | 2.26E+01 | | -8.49E+00 | 1.04E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 2.83E-01 | 2.83E-01 | 2.19E-01 | 1.40E-01 |
| | SB-127 | 473.00 | | 25.00 | 1.13E+07 | 8.32E+06 | 9.85E+05 | 5.34E+06 |
| | | 685.20 | | 35.70 | 8.32E+06 | | -1.54E+06 | 3.88E+06 |
| | | 783.80 | | 14.70 | 2.29E+07 | | -7.74E+05 | 1.07E+07 |
| | I-129 | 29.78 | | 57.00 | 8.80E-02 | 8.80E-02 | -4.13E-02 | 4.26E-02 |
| | | 33.60 | | 13.20 | 3.57E-01 | | 7.41E-05 | 1.73E-01 |
| | | 39.58 | | 7.52 | 5.88E-01 | | 2.36E-02 | 2.85E-01 |
| | I-131 | 284.30 | | 6.05 | 4.21E+03 | 3.21E+02 | -4.51E+02 | 2.03E+03 |
| | | 364.48 | | 81.20 | 3.21E+02 | | 3.85E+01 | 1.54E+02 |
| | | 636.97 | | 7.26 | 3.68E+03 | | -1.86E+02 | 1.72E+03 |
| | | 722.89 | | 1.80 | 1.57E+04 | | -8.92E+01 | 7.33E+03 |
| | TE-132 | 49.72 | | 13.10 | 5.14E+08 | 7.58E+07 | -8.71E+08 | 2.50E+08 |
| | | 228.16 | | 88.00 | 7.58E+07 | | -2.28E+06 | 3.66E+07 |
| | BA-133 | 81.00 | | 33.00 | 1.56E-01 | 1.16E-01 | -5.33E-01 | 7.61E-02 |
| | | 302.84 | | 17.80 | 3.11E-01 | | -4.66E-02 | 1.50E-01 |
| | | 356.01 | | 60.00 | 1.16E-01 | | 2.94E-03 | 5.62E-02 |
| @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | XE-133 | 81.00 | | 38.00 | 6.66E+04 | 6.66E+04 | -2.28E+05 | 3.26E+04 |
| | CS-134 | 563.23 | | 8.38 | 6.67E-01 | 7.01E-02 | -1.34E-01 | 3.14E-01 |
| | | 569.32 | | 15.43 | 3.46E-01 | | -1.05E-01 | 1.62E-01 |
| | | 604.70 | | 97.60 | 7.01E-02 | | 6.67E-03 | 3.33E-02 |
| | | 795.84 | | 85.40 | 8.44E-02 | | 4.79E-02 | 3.97E-02 |
| | | 801.93 | | 8.73 | 6.89E-01 | | -3.79E-01 | 3.20E-01 |
| | CS-135 | 268.24 | | 16.00 | 3.47E-01 | 3.47E-01 | 4.50E-01 | 1.68E-01 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CS-136 | 153.22 | | 7.46 | 1.13E+02 | 9.76E+00 | 6.29E+01 | 5.48E+01 |
| | | 163.89 | | 4.61 | 1.69E+02 | | -8.20E+01 | 8.19E+01 |
| | | 176.55 | | 13.56 | 5.83E+01 | | -6.80E+00 | 2.82E+01 |
| | | 273.65 | | 12.66 | 8.09E+01 | | -3.08E+01 | 3.92E+01 |
| | | 340.57 | | 48.50 | 2.55E+01 | | 2.70E+00 | 1.24E+01 |
| | | 818.50 | | 99.70 | 9.76E+00 | | 1.78E-01 | 4.51E+00 |
| | | 1048.07 | | 79.60 | 1.52E+01 | | 3.73E+00 | 7.07E+00 |
| | | 1235.34 | | 19.70 | 8.89E+01 | | 1.30E+01 | 4.19E+01 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | CS-137 | 661.65 | * | 85.12 | 1.15E-01 | 1.15E-01 | 1.47E-01 | 5.56E-02 |
| | LA-138 | 788.74 | | 34.00 | 1.71E-01 | 7.10E-02 | 7.22E-02 | 8.01E-02 |
| | | 1435.80 | | 66.00 | 7.10E-02 | | -5.62E-03 | 3.10E-02 |
| | CE-139 | 165.85 | | 80.35 | 8.76E-02 | 8.76E-02 | 2.51E-02 | 4.25E-02 |
| | BA-140 | 162.64 | | 6.70 | 1.37E+02 | 4.30E+01 | -2.80E+00 | 6.65E+01 |
| | | 304.84 | | 4.50 | 2.31E+02 | | -2.17E+02 | 1.11E+02 |
| | | 423.70 | | 3.20 | 3.59E+02 | | -1.56E+01 | 1.72E+02 |
| | | 437.55 | | 2.00 | 5.55E+02 | | 1.18E+02 | 2.64E+02 |
| | | 537.32 | | 25.00 | 4.30E+01 | | -7.57E+00 | 2.03E+01 |
| | LA-140 | 328.77 | | 20.50 | 6.17E+01 | 1.27E+01 | 4.00E+01 | 2.98E+01 |
| | | 487.03 | | 45.50 | 2.46E+01 | | 6.99E+00 | 1.17E+01 |
| | | 815.85 | | 23.50 | 4.97E+01 | | 1.40E+01 | 2.31E+01 |
| | | 1596.49 | | 95.49 | 1.27E+01 | | -1.86E+00 | 5.61E+00 |
| | CE-141 | 145.44 | | 48.40 | 7.46E-01 | 7.46E-01 | 1.01E-01 | 3.62E-01 |
| @ | CE-143 | 57.36 | | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 293.26 | | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 664.55 | | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CE-144 | 133.54 | | 10.80 | 4.86E-01 | 4.86E-01 | -5.60E-01 | 2.36E-01 |
| | PM-144 | 476.78 | | 42.00 | 1.53E-01 | 6.68E-02 | 4.83E-03 | 7.29E-02 |
| | | 618.01 | | 98.60 | 6.68E-02 | | -1.86E-02 | 3.15E-02 |
| | | 696.49 | | 99.49 | 7.06E-02 | | 9.45E-03 | 3.32E-02 |
| | PM-145 | 36.85 | | 21.70 | 2.14E-01 | 1.16E-01 | 3.78E-02 | 1.04E-01 |
| | | 37.36 | | 39.70 | 1.16E-01 | | 1.93E-02 | 5.62E-02 |
| | | 42.30 | | 15.10 | 2.95E-01 | | 1.58E-02 | 1.43E-01 |
| | | 72.40 | | 2.31 | 2.61E+00 | | -2.79E+00 | 1.28E+00 |
| | PM-146 | 453.90 | | 39.94 | 1.23E-01 | 1.23E-01 | -1.86E-02 | 5.84E-02 |
| | | 735.90 | | 14.01 | 4.22E-01 | | -4.85E-02 | 1.98E-01 |
| | | 747.13 | | 13.10 | 4.51E-01 | | -1.51E-01 | 2.11E-01 |
| | ND-147 | 91.11 | | 28.90 | 1.11E+02 | 1.11E+02 | 2.05E+02 | 5.45E+01 |
| | | 531.02 | | 13.10 | 2.02E+02 | | 1.70E+01 | 9.55E+01 |
| | PM-149 | 285.90 | | 3.10 | 5.19E+13 | 5.19E+13 | 1.09E+13 | 2.50E+13 |
| | EU-152 | 121.78 | | 20.50 | 2.03E-01 | 2.03E-01 | -4.28E-02 | 9.85E-02 |
| | | 244.69 | | 5.40 | 9.06E-01 | | -7.25E-01 | 4.38E-01 |
| | | 344.27 | | 19.13 | 2.61E-01 | | -1.86E-02 | 1.25E-01 |
| | | 778.89 | | 9.20 | 6.19E-01 | | -8.52E-02 | 2.89E-01 |
| | | 964.01 | | 10.40 | 8.31E-01 | | -1.44E+00 | 3.94E-01 |
| | | 1085.78 | | 7.22 | 8.88E-01 | | 1.21E-01 | 4.10E-01 |
| | | 1112.02 | | 9.60 | 6.80E-01 | | 8.76E-03 | 3.14E-01 |
| | | 1407.95 | | 14.94 | 4.56E-01 | | 1.65E-01 | 2.08E-01 |
| | GD-153 | 97.43 | | 31.30 | 1.88E-01 | 1.88E-01 | -2.99E-01 | 9.17E-02 |
| | | 103.18 | | 22.20 | 2.57E-01 | | 6.05E-02 | 1.25E-01 |
| | EU-154 | 123.07 | | 40.50 | 1.06E-01 | 1.06E-01 | 9.40E-03 | 5.15E-02 |
| | | 723.30 | | 19.70 | 2.81E-01 | | -1.60E-03 | 1.31E-01 |
| | | 873.19 | | 11.50 | 4.86E-01 | | -5.15E-02 | 2.25E-01 |
| | | 996.32 | | 10.30 | 5.77E-01 | | -1.08E-01 | 2.66E-01 |
| | | 1004.76 | | 17.90 | 3.99E-01 | | 2.89E-01 | 1.87E-01 |
| | | 1274.45 | | 35.50 | 1.87E-01 | | 1.81E-02 | 8.54E-02 |
| | EU-155 | 86.50 | | 30.90 | 1.83E-01 | 1.83E-01 | 2.10E-02 | 8.95E-02 |
| | | 105.30 | | 20.70 | 2.15E-01 | | 2.19E-02 | 1.05E-01 |
| | EU-156 | 811.77 | | 10.40 | 4.83E+01 | 4.83E+01 | -9.44E+00 | 2.24E+01 |
| | | 1153.47 | | 7.20 | 1.03E+02 | | 8.80E+01 | 4.80E+01 |
| | | 1230.71 | | 8.90 | 8.65E+01 | | 7.86E+00 | 4.05E+01 |
| | HO-166M | 184.41 | | 72.60 | 7.53E-02 | 7.53E-02 | 1.41E-01 | 3.67E-02 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | HO-166M | 280.45 | | 29.60 | 1.82E-01 | 7.53E-02 | 1.49E-01 | 8.81E-02 |
| | | 410.94 | | 11.10 | 4.75E-01 | | -1.35E-02 | 2.27E-01 |
| | | 711.69 | | 54.10 | 1.14E-01 | | 7.11E-02 | 5.38E-02 |
| | TM-171 | 66.72 | | 0.14 | 3.94E+01 | 3.94E+01 | -3.54E-01 | 1.93E+01 |
| | HF-172 | 67.35 | | 5.31 | 1.05E+00 | 4.21E-01 | 4.47E-01 | 5.13E-01 |
| | | 125.81 | | 11.30 | 4.21E-01 | | -1.84E-01 | 2.05E-01 |
| | LU-172 | 181.53 | | 20.60 | 6.02E+03 | 3.18E+03 | 5.05E+02 | 2.91E+03 |
| | | 900.72 | | 29.81 | 6.12E+03 | | 7.88E+02 | 2.86E+03 |
| | | 1093.66 | | 62.50 | 3.18E+03 | | 1.67E+02 | 1.48E+03 |
| | LU-173 | 100.72 | | 5.24 | 9.65E-01 | 3.03E-01 | 2.85E-01 | 4.70E-01 |
| | | 272.11 | | 21.20 | 3.03E-01 | | -1.28E-01 | 1.47E-01 |
| | HF-175 | 343.40 | | 84.00 | 1.53E-01 | 1.53E-01 | -1.11E-02 | 7.33E-02 |
| | LU-176 | 88.34 | | 13.30 | 4.19E-01 | 4.87E-02 | -2.61E-01 | 2.05E-01 |
| | | 201.83 | | 86.00 | 5.08E-02 | | 2.77E-03 | 2.46E-02 |
| | | 306.78 | | 94.00 | 4.87E-02 | | -2.67E-02 | 2.34E-02 |
| | HF-181 | 133.02 | | 41.70 | 5.00E-01 | 3.24E-01 | -5.77E-01 | 2.43E-01 |
| | | 345.85 | | 17.20 | 1.42E+00 | | -1.88E-01 | 6.81E-01 |
| | | 482.03 | | 82.80 | 3.24E-01 | | 4.56E-02 | 1.54E-01 |
| | TA-182 | 67.75 | | 41.20 | 2.23E-01 | 2.23E-01 | 9.50E-02 | 1.09E-01 |
| | | 1121.30 | | 34.90 | 5.27E-01 | | 6.04E-01 | 2.51E-01 |
| | | 1189.05 | | 16.23 | 7.53E-01 | | -1.34E-01 | 3.47E-01 |
| | | 1221.41 | | 26.98 | 4.96E-01 | | -2.25E-01 | 2.30E-01 |
| | | 1231.02 | | 11.44 | 1.32E+00 | | 1.20E-01 | 6.19E-01 |
| | IR-192 | 308.46 | | 29.68 | 3.92E-01 | 2.79E-01 | -4.76E-02 | 1.88E-01 |
| | | 468.07 | | 48.10 | 2.79E-01 | | -1.91E-01 | 1.33E-01 |
| | HG-203 | 279.19 | | 77.30 | 3.10E-01 | 3.10E-01 | 2.45E-01 | 1.50E-01 |
| | TL-204 | 374.74 | | 94.11 | 5.53E-02 | 5.53E-02 | 7.16E-03 | 2.64E-02 |
| | | 899.15 | | 99.16 | 6.44E-02 | | -1.87E-02 | 3.00E-02 |
| | | 911.74 | | 91.10 | 1.34E-01 | | 2.82E-01 | 6.46E-02 |
| | BI-207 | 569.67 | | 97.72 | 5.16E-02 | 5.16E-02 | 3.15E-03 | 2.42E-02 |
| | | 1063.62 | | 74.90 | 8.60E-02 | | -7.84E-03 | 3.98E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 3.19E-01 | 1.39E-01 | 9.03E-01 | 1.55E-01 |
| | | 860.37 | * | 4.48 | 1.87E+00 | | 1.89E+00 | 8.88E-01 |
| | | 2614.66 | * | 35.85 | 1.39E-01 | | 8.93E-01 | 5.69E-02 |
| | BI-210M | 262.00 | | 45.00 | 1.06E-01 | 1.06E-01 | 2.15E-02 | 5.11E-02 |
| | | 300.00 | | 23.00 | 2.50E-01 | | 3.00E-02 | 1.21E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 1.79E+00 | 1.79E+00 | 1.00E+00 | 8.80E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.84E+00 | 1.84E+00 | 2.67E-01 | 8.80E-01 |
| | | 831.96 | | 2.90 | 2.08E+00 | | 6.65E-01 | 9.71E-01 |
| + | BI-212 | 727.17 | * | 11.80 | 7.33E-01 | 7.33E-01 | 9.50E-01 | 3.51E-01 |
| | | 1620.62 | | 2.75 | 1.86E+00 | | -1.20E-01 | 8.11E-01 |
| + | PB-212 | 238.63 | * | 44.60 | 2.00E-01 | 2.00E-01 | 1.17E+00 | 9.80E-02 |
| | | 300.09 | | 3.41 | 1.69E+00 | | 2.02E-01 | 8.15E-01 |
| + | BI-214 | 609.31 | * | 46.30 | 2.02E-01 | 2.02E-01 | 9.66E-01 | 9.77E-02 |
| | | 1120.29 | * | 15.10 | 7.40E-01 | | 1.05E+00 | 3.53E-01 |
| | | 1764.49 | * | 15.80 | 4.38E-01 | | 1.19E+00 | 1.97E-01 |
| | | 2204.22 | * | 4.98 | 1.58E+00 | | 1.01E+00 | 7.11E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 4.72E-01 | 2.08E-01 | 9.25E-01 | 2.31E-01 |
| | | 351.92 | * | 37.19 | 2.08E-01 | | 9.70E-01 | 1.01E-01 |
| | RN-219 | 401.80 | | 6.50 | 7.70E-01 | 7.70E-01 | -2.29E-01 | 3.67E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.33E+00 | 1.33E+00 | 2.23E-01 | 6.38E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 2.24E+00 | 2.24E+00 | 2.97E+00 | 1.10E+00 |
| | RA-225 | 40.00 | | 31.00 | 1.45E+01 | 1.45E+01 | -3.59E+00 | 7.02E+00 |

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | RA-226 | 186.21 | * | 3.28 | 2.40E+00 | 2.40E+00 | 3.04E+00 | 1.18E+00 |
| | TH-227 | 50.10 | | 8.40 | 5.34E-01 | 4.89E-01 | -3.89E-01 | 2.60E-01 |
| | | 236.00 | | 11.50 | 4.89E-01 | | -3.32E+00 | 2.38E-01 |
| | | 256.20 | | 6.30 | 7.59E-01 | | -3.32E-01 | 3.66E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 5.14E-01 | 3.77E-01 | 1.06E+00 | 2.48E-01 |
| | | 911.07 | * | 27.70 | 3.77E-01 | | 9.08E-01 | 1.81E-01 |
| | | 969.11 | * | 16.60 | 6.55E-01 | | 1.20E+00 | 3.14E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.92E-01 | 2.92E-01 | 2.79E-01 | 1.43E-01 |
| | | 62.85 | | 4.60 | 1.24E+00 | | 2.05E+00 | 6.07E-01 |
| | | 67.67 | | 0.37 | 1.36E+01 | | 5.80E+00 | 6.65E+00 |
| | PA-231 | 283.67 | | 1.60 | 3.09E+00 | 2.36E+00 | -6.76E-01 | 1.49E+00 |
| | | 302.67 | | 2.30 | 2.36E+00 | | -3.54E-01 | 1.14E+00 |
| | TH-231 | 25.64 | | 14.70 | 4.49E-01 | 4.49E-01 | -2.63E+00 | 2.19E-01 |
| | | 84.21 | | 6.40 | 8.14E-01 | | -2.98E-01 | 3.99E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.59E+00 | 1.59E+00 | 6.47E-01 | 7.66E-01 |
| | PA-234 | 131.20 | | 20.40 | 2.18E-01 | 2.18E-01 | 1.24E-01 | 1.06E-01 |
| | | 733.99 | | 8.80 | 6.35E-01 | | -1.61E-01 | 2.97E-01 |
| | | 946.00 | | 12.00 | 5.26E-01 | | 3.65E-02 | 2.45E-01 |
| | PA-234M | 1001.03 | | 0.92 | 6.83E+00 | 6.83E+00 | 4.77E-01 | 3.16E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 1.66E+00 | 1.66E+00 | 9.99E-01 | 8.14E-01 |
| | U-235 | 143.76 | | 10.50 | 4.17E-01 | 4.17E-01 | 2.22E-01 | 2.03E-01 |
| | | 163.35 | | 4.70 | 8.87E-01 | | -4.30E-01 | 4.29E-01 |
| | | 205.31 | | 4.70 | 9.29E-01 | | -1.29E+00 | 4.49E-01 |
| | NP-237 | 86.50 | | 12.60 | 4.31E-01 | 4.31E-01 | 4.96E-02 | 2.11E-01 |
| | NP-239 | 106.10 | | 22.70 | 9.42E+11 | 9.42E+11 | 4.94E+11 | 4.59E+11 |
| | | 228.18 | | 10.70 | 2.06E+12 | | -6.20E+10 | 9.92E+11 |
| | | 277.60 | | 14.10 | 1.91E+12 | | 1.32E+12 | 9.24E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.42E-01 | 1.42E-01 | 3.08E-02 | 6.92E-02 |
| + | AM-243 | 74.67 | * | 66.00 | 1.42E-01 | 1.42E-01 | 2.28E-01 | 7.00E-02 |
| | CM-243 | 209.75 | | 3.29 | 1.53E+00 | 3.94E-01 | 1.72E+00 | 7.41E-01 |
| | | 228.14 | | 10.60 | 4.25E-01 | | -1.28E-02 | 2.05E-01 |
| | | 277.60 | | 14.00 | 3.94E-01 | | 2.73E-01 | 1.91E-01 |

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

No Action Level results available for reporting purposes.

Analysis Report for 1707087-16

HTC-A03-S003-0612-01

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S003-0612-01

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 1 | 75 | 103 | 86 | 155 | 494 | 153 |
| 25: | 71 | 64 | 71 | 72 | 62 | 65 | 51 | 65 |
| 33: | 71 | 68 | 66 | 61 | 76 | 84 | 66 | 67 |
| 41: | 69 | 70 | 67 | 100 | 75 | 98 | 163 | 111 |
| 49: | 91 | 93 | 85 | 82 | 106 | 103 | 92 | 105 |
| 57: | 118 | 116 | 141 | 139 | 126 | 131 | 170 | 275 |
| 65: | 140 | 110 | 141 | 128 | 140 | 150 | 137 | 131 |
| 73: | 167 | 170 | 354 | 296 | 330 | 497 | 171 | 141 |
| 81: | 125 | 131 | 117 | 171 | 149 | 137 | 157 | 229 |
| 89: | 121 | 172 | 155 | 132 | 287 | 243 | 140 | 91 |
| 97: | 103 | 84 | 106 | 125 | 89 | 100 | 79 | 77 |
| 105: | 110 | 102 | 92 | 83 | 89 | 94 | 82 | 81 |
| 113: | 98 | 84 | 94 | 100 | 69 | 86 | 74 | 74 |
| 121: | 77 | 66 | 87 | 89 | 90 | 79 | 83 | 85 |
| 129: | 100 | 110 | 93 | 79 | 72 | 87 | 70 | 65 |
| 137: | 90 | 95 | 90 | 73 | 67 | 83 | 67 | 106 |
| 145: | 77 | 68 | 69 | 71 | 84 | 68 | 80 | 81 |
| 153: | 81 | 78 | 94 | 70 | 69 | 66 | 77 | 72 |
| 161: | 65 | 69 | 71 | 69 | 62 | 53 | 73 | 79 |
| 169: | 49 | 64 | 65 | 70 | 64 | 67 | 69 | 66 |
| 177: | 49 | 63 | 63 | 73 | 53 | 58 | 59 | 67 |
| 185: | 90 | 146 | 140 | 66 | 64 | 78 | 58 | 62 |
| 193: | 57 | 61 | 53 | 62 | 54 | 63 | 67 | 63 |
| 201: | 52 | 61 | 53 | 58 | 47 | 55 | 56 | 65 |
| 209: | 82 | 106 | 62 | 46 | 61 | 38 | 46 | 52 |
| 217: | 58 | 57 | 51 | 60 | 53 | 44 | 50 | 60 |
| 225: | 58 | 43 | 50 | 66 | 50 | 50 | 45 | 54 |
| 233: | 54 | 39 | 52 | 68 | 65 | 177 | 561 | 233 |
| 241: | 115 | 148 | 103 | 50 | 51 | 31 | 44 | 40 |
| 249: | 43 | 44 | 46 | 43 | 42 | 32 | 31 | 34 |
| 257: | 39 | 40 | 39 | 43 | 41 | 41 | 28 | 29 |
| 265: | 28 | 26 | 33 | 49 | 38 | 61 | 61 | 62 |
| 273: | 27 | 40 | 41 | 37 | 46 | 64 | 40 | 40 |
| 281: | 39 | 34 | 40 | 36 | 25 | 28 | 39 | 32 |
| 289: | 37 | 25 | 31 | 33 | 36 | 49 | 134 | 179 |
| 297: | 46 | 33 | 40 | 55 | 54 | 43 | 33 | 24 |
| 305: | 30 | 28 | 20 | 25 | 36 | 21 | 24 | 29 |
| 313: | 24 | 31 | 34 | 24 | 28 | 30 | 32 | 34 |
| 321: | 33 | 29 | 36 | 31 | 25 | 29 | 34 | 59 |
| 329: | 53 | 33 | 32 | 34 | 42 | 27 | 30 | 24 |
| 337: | 44 | 83 | 119 | 34 | 22 | 32 | 25 | 26 |
| 345: | 26 | 20 | 22 | 30 | 23 | 32 | 72 | 284 |
| 353: | 178 | 33 | 25 | 30 | 29 | 27 | 18 | 24 |
| 361: | 21 | 25 | 29 | 12 | 20 | 32 | 31 | 22 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 23 | 25 | 17 | 25 | 20 | 25 | 22 | 21 |

Sample Title: HTC-A03-S003-0612-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 26 | 22 | 24 | 21 | 22 | 34 | 20 | 13 |
| 385: | 23 | 21 | 21 | 30 | 18 | 23 | 26 | 17 |
| 393: | 32 | 18 | 22 | 18 | 17 | 19 | 19 | 20 |
| 401: | 20 | 27 | 21 | 22 | 19 | 28 | 28 | 22 |
| 409: | 26 | 23 | 23 | 20 | 23 | 22 | 26 | 37 |
| 417: | 22 | 19 | 16 | 29 | 20 | 20 | 18 | 18 |
| 425: | 27 | 25 | 25 | 19 | 25 | 21 | 22 | 18 |
| 433: | 17 | 17 | 11 | 23 | 24 | 17 | 21 | 25 |
| 441: | 14 | 18 | 18 | 21 | 19 | 11 | 20 | 17 |
| 449: | 16 | 16 | 14 | 9 | 25 | 17 | 11 | 11 |
| 457: | 23 | 16 | 19 | 21 | 14 | 19 | 53 | 25 |
| 465: | 24 | 30 | 17 | 17 | 19 | 9 | 15 | 13 |
| 473: | 19 | 24 | 17 | 11 | 14 | 20 | 25 | 18 |
| 481: | 15 | 17 | 13 | 19 | 18 | 11 | 15 | 19 |
| 489: | 20 | 14 | 17 | 11 | 20 | 18 | 12 | 16 |
| 497: | 9 | 13 | 14 | 20 | 15 | 16 | 11 | 18 |
| 505: | 18 | 20 | 7 | 15 | 19 | 43 | 84 | 49 |
| 513: | 33 | 21 | 23 | 17 | 15 | 17 | 13 | 15 |
| 521: | 17 | 14 | 19 | 16 | 13 | 17 | 13 | 9 |
| 529: | 14 | 14 | 14 | 14 | 12 | 19 | 11 | 12 |
| 537: | 12 | 13 | 7 | 17 | 13 | 17 | 12 | 13 |
| 545: | 15 | 9 | 11 | 20 | 18 | 11 | 8 | 16 |
| 553: | 9 | 11 | 11 | 13 | 12 | 20 | 12 | 8 |
| 561: | 18 | 13 | 19 | 15 | 10 | 7 | 14 | 12 |
| 569: | 12 | 13 | 13 | 9 | 12 | 16 | 12 | 17 |
| 577: | 14 | 12 | 13 | 15 | 19 | 31 | 140 | 110 |
| 585: | 26 | 15 | 18 | 19 | 17 | 18 | 12 | 9 |
| 593: | 10 | 9 | 17 | 18 | 8 | 26 | 19 | 13 |
| 601: | 11 | 10 | 16 | 17 | 13 | 13 | 16 | 38 |
| 609: | 173 | 183 | 41 | 14 | 18 | 18 | 12 | 12 |
| 617: | 17 | 11 | 8 | 16 | 13 | 15 | 15 | 13 |
| 625: | 7 | 15 | 14 | 15 | 10 | 13 | 9 | 10 |
| 633: | 10 | 14 | 7 | 14 | 8 | 8 | 15 | 8 |
| 641: | 14 | 9 | 12 | 13 | 10 | 8 | 8 | 15 |
| 649: | 18 | 10 | 11 | 6 | 15 | 12 | 14 | 11 |
| 657: | 13 | 16 | 12 | 15 | 42 | 59 | 24 | 14 |
| 665: | 19 | 17 | 14 | 14 | 17 | 9 | 7 | 12 |
| 673: | 12 | 17 | 14 | 16 | 11 | 9 | 14 | 14 |
| 681: | 7 | 13 | 11 | 5 | 10 | 8 | 9 | 10 |
| 689: | 11 | 10 | 10 | 7 | 12 | 12 | 13 | 13 |
| 697: | 11 | 15 | 8 | 13 | 13 | 18 | 18 | 18 |
| 705: | 15 | 9 | 15 | 8 | 15 | 14 | 15 | 9 |
| 713: | 8 | 13 | 18 | 9 | 5 | 12 | 4 | 8 |
| 721: | 7 | 9 | 6 | 5 | 11 | 22 | 43 | 36 |
| 729: | 18 | 9 | 10 | 12 | 7 | 12 | 15 | 8 |
| 737: | 7 | 9 | 16 | 9 | 14 | 14 | 19 | 7 |
| 745: | 10 | 9 | 16 | 12 | 10 | 8 | 8 | 10 |
| 753: | 8 | 10 | 11 | 10 | 8 | 8 | 10 | 11 |
| 761: | 9 | 17 | 9 | 10 | 10 | 12 | 12 | 24 |
| 769: | 27 | 23 | 18 | 12 | 14 | 11 | 6 | 13 |
| 777: | 9 | 13 | 6 | 9 | 8 | 7 | 9 | 9 |
| 785: | 11 | 10 | 15 | 12 | 13 | 5 | 7 | 7 |
| 793: | 5 | 14 | 26 | 20 | 5 | 10 | 8 | 8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 12 | 8 | 13 | 6 | 4 | 16 | 12 | 8 |

Sample Title: HTC-A03-S003-0612-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 9 | 10 | 12 | 3 | 6 | 9 | 7 | 8 |
| 817: | 14 | 4 | 7 | 5 | 6 | 5 | 9 | 10 |
| 825: | 12 | 7 | 8 | 4 | 5 | 8 | 13 | 12 |
| 833: | 6 | 12 | 12 | 14 | 5 | 6 | 6 | 14 |
| 841: | 18 | 12 | 7 | 9 | 8 | 7 | 8 | 10 |
| 849: | 2 | 11 | 9 | 6 | 10 | 5 | 7 | 8 |
| 857: | 10 | 10 | 9 | 21 | 20 | 10 | 10 | 11 |
| 865: | 9 | 4 | 11 | 9 | 9 | 8 | 8 | 7 |
| 873: | 8 | 6 | 6 | 8 | 6 | 8 | 7 | 7 |
| 881: | 7 | 6 | 9 | 6 | 8 | 9 | 12 | 4 |
| 889: | 9 | 8 | 10 | 19 | 10 | 15 | 4 | 8 |
| 897: | 8 | 8 | 9 | 10 | 10 | 8 | 13 | 9 |
| 905: | 13 | 10 | 13 | 4 | 8 | 38 | 90 | 73 |
| 913: | 16 | 5 | 10 | 12 | 7 | 6 | 5 | 8 |
| 921: | 10 | 7 | 5 | 7 | 9 | 10 | 5 | 15 |
| 929: | 6 | 5 | 9 | 5 | 12 | 17 | 12 | 13 |
| 937: | 6 | 5 | 12 | 9 | 6 | 7 | 7 | 7 |
| 945: | 6 | 11 | 9 | 10 | 11 | 10 | 10 | 10 |
| 953: | 6 | 7 | 6 | 8 | 6 | 9 | 3 | 10 |
| 961: | 11 | 11 | 14 | 21 | 30 | 15 | 10 | 34 |
| 969: | 61 | 36 | 6 | 8 | 11 | 3 | 6 | 8 |
| 977: | 7 | 10 | 8 | 5 | 5 | 12 | 11 | 9 |
| 985: | 4 | 6 | 8 | 8 | 13 | 8 | 7 | 7 |
| 993: | 6 | 10 | 10 | 4 | 10 | 4 | 3 | 7 |
| 1001: | 9 | 15 | 8 | 9 | 6 | 10 | 12 | 8 |
| 1009: | 4 | 12 | 6 | 8 | 7 | 18 | 6 | 10 |
| 1017: | 4 | 2 | 7 | 8 | 9 | 7 | 5 | 5 |
| 1025: | 7 | 10 | 4 | 12 | 11 | 9 | 7 | 6 |
| 1033: | 3 | 9 | 6 | 4 | 4 | 6 | 9 | 8 |
| 1041: | 7 | 9 | 6 | 3 | 8 | 9 | 10 | 7 |
| 1049: | 7 | 3 | 11 | 9 | 7 | 9 | 5 | 5 |
| 1057: | 5 | 13 | 7 | 9 | 1 | 4 | 10 | 13 |
| 1065: | 8 | 7 | 6 | 6 | 8 | 5 | 4 | 12 |
| 1073: | 6 | 6 | 6 | 9 | 8 | 6 | 14 | 10 |
| 1081: | 6 | 6 | 9 | 6 | 5 | 9 | 6 | 8 |
| 1089: | 8 | 2 | 9 | 9 | 10 | 7 | 10 | 11 |
| 1097: | 9 | 7 | 5 | 5 | 10 | 8 | 6 | 9 |
| 1105: | 6 | 8 | 11 | 6 | 7 | 7 | 14 | 6 |
| 1113: | 3 | 7 | 5 | 8 | 5 | 11 | 14 | 40 |
| 1121: | 32 | 15 | 7 | 7 | 12 | 9 | 5 | 9 |
| 1129: | 2 | 7 | 7 | 7 | 9 | 13 | 10 | 7 |
| 1137: | 8 | 10 | 11 | 4 | 9 | 4 | 4 | 4 |
| 1145: | 6 | 7 | 7 | 5 | 6 | 12 | 6 | 8 |
| 1153: | 11 | 14 | 9 | 13 | 4 | 6 | 5 | 6 |
| 1161: | 5 | 11 | 5 | 17 | 10 | 7 | 8 | 9 |
| 1169: | 5 | 6 | 9 | 2 | 10 | 9 | 15 | 8 |
| 1177: | 8 | 15 | 9 | 12 | 6 | 14 | 2 | 9 |
| 1185: | 6 | 2 | 6 | 9 | 5 | 8 | 8 | 10 |
| 1193: | 3 | 13 | 13 | 2 | 10 | 10 | 10 | 7 |
| 1201: | 5 | 9 | 9 | 11 | 11 | 7 | 8 | 11 |
| 1209: | 6 | 5 | 14 | 7 | 10 | 7 | 11 | 8 |
| 1217: | 14 | 8 | 10 | 5 | 5 | 12 | 10 | 6 |
| 1225: | 9 | 11 | 8 | 6 | 13 | 12 | 7 | 12 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 14 | 10 | 9 | 7 | 14 | 27 | 20 | 10 |

Sample Title: HTC-A03-S003-0612-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 6 | 7 | 5 | 13 | 6 | 7 | 6 | 6 |
| 1249: | 7 | 8 | 10 | 6 | 7 | 11 | 9 | 6 |
| 1257: | 5 | 9 | 10 | 6 | 6 | 7 | 5 | 9 |
| 1265: | 8 | 3 | 6 | 3 | 4 | 6 | 9 | 3 |
| 1273: | 5 | 3 | 6 | 5 | 9 | 7 | 7 | 12 |
| 1281: | 10 | 9 | 5 | 6 | 3 | 5 | 7 | 4 |
| 1289: | 4 | 2 | 6 | 4 | 8 | 8 | 5 | 3 |
| 1297: | 5 | 5 | 4 | 3 | 5 | 5 | 4 | 12 |
| 1305: | 9 | 5 | 4 | 3 | 10 | 5 | 5 | 2 |
| 1313: | 4 | 4 | 7 | 2 | 6 | 6 | 4 | 2 |
| 1321: | 1 | 6 | 7 | 3 | 4 | 5 | 2 | 3 |
| 1329: | 3 | 4 | 2 | 5 | 7 | 1 | 2 | 5 |
| 1337: | 3 | 4 | 4 | 3 | 5 | 7 | 2 | 2 |
| 1345: | 6 | 2 | 2 | 4 | 4 | 4 | 8 | 5 |
| 1353: | 7 | 1 | 7 | 5 | 4 | 1 | 6 | 6 |
| 1361: | 7 | 1 | 4 | 5 | 4 | 4 | 7 | 8 |
| 1369: | 2 | 3 | 6 | 0 | 2 | 4 | 1 | 8 |
| 1377: | 8 | 10 | 8 | 3 | 2 | 5 | 3 | 3 |
| 1385: | 7 | 1 | 3 | 4 | 5 | 5 | 2 | 5 |
| 1393: | 2 | 6 | 7 | 2 | 2 | 3 | 1 | 1 |
| 1401: | 9 | 4 | 6 | 2 | 3 | 8 | 5 | 9 |
| 1409: | 7 | 3 | 4 | 1 | 1 | 5 | 0 | 3 |
| 1417: | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 5 |
| 1425: | 4 | 1 | 2 | 2 | 5 | 5 | 3 | 2 |
| 1433: | 1 | 3 | 2 | 0 | 4 | 4 | 1 | 1 |
| 1441: | 0 | 2 | 4 | 6 | 6 | 6 | 3 | 1 |
| 1449: | 2 | 2 | 3 | 2 | 6 | 5 | 2 | 5 |
| 1457: | 6 | 14 | 88 | 314 | 339 | 115 | 24 | 4 |
| 1465: | 13 | 9 | 3 | 2 | 3 | 1 | 3 | 1 |
| 1473: | 1 | 6 | 1 | 1 | 0 | 3 | 3 | 2 |
| 1481: | 3 | 0 | 1 | 2 | 3 | 3 | 5 | 0 |
| 1489: | 1 | 4 | 1 | 1 | 3 | 5 | 4 | 4 |
| 1497: | 2 | 1 | 2 | 7 | 7 | 3 | 3 | 1 |
| 1505: | 5 | 3 | 2 | 3 | 8 | 4 | 4 | 1 |
| 1513: | 2 | 2 | 2 | 4 | 0 | 2 | 3 | 1 |
| 1521: | 4 | 2 | 1 | 1 | 0 | 1 | 5 | 0 |
| 1529: | 4 | 4 | 1 | 1 | 5 | 3 | 1 | 3 |
| 1537: | 4 | 3 | 3 | 2 | 1 | 4 | 3 | 4 |
| 1545: | 0 | 1 | 1 | 2 | 2 | 0 | 0 | 3 |
| 1553: | 1 | 1 | 2 | 0 | 0 | 5 | 5 | 1 |
| 1561: | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 0 |
| 1569: | 2 | 0 | 2 | 3 | 1 | 1 | 3 | 2 |
| 1577: | 1 | 3 | 2 | 1 | 0 | 3 | 1 | 9 |
| 1585: | 0 | 5 | 5 | 8 | 7 | 2 | 8 | 5 |
| 1593: | 6 | 4 | 2 | 3 | 2 | 1 | 2 | 4 |
| 1601: | 0 | 2 | 0 | 2 | 2 | 1 | 3 | 3 |
| 1609: | 1 | 0 | 2 | 2 | 2 | 0 | 4 | 2 |
| 1617: | 1 | 1 | 3 | 4 | 2 | 3 | 2 | 3 |
| 1625: | 1 | 1 | 3 | 3 | 2 | 2 | 5 | 2 |
| 1633: | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 0 |
| 1641: | 2 | 2 | 3 | 2 | 1 | 0 | 1 | 2 |
| 1649: | 1 | 1 | 0 | 2 | 3 | 1 | 2 | 1 |
| 1657: | 2 | 2 | 2 | 2 | 1 | 5 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 0 | 1 | 3 | 1 | 0 | 1 | 1 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 |
| 1681: | 1 | 2 | 0 | 2 | 1 | 1 | 1 | 1 |
| 1689: | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| 1697: | 1 | 2 | 2 | 1 | 5 | 2 | 1 | 1 |
| 1705: | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 0 |
| 1713: | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 |
| 1721: | 3 | 1 | 1 | 3 | 1 | 1 | 0 | 6 |
| 1729: | 3 | 5 | 1 | 1 | 0 | 3 | 1 | 0 |
| 1737: | 0 | 2 | 2 | 1 | 1 | 2 | 4 | 1 |
| 1745: | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1753: | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 1761: | 3 | 6 | 17 | 31 | 20 | 1 | 3 | 2 |
| 1769: | 1 | 0 | 2 | 0 | 2 | 1 | 1 | 1 |
| 1777: | 2 | 0 | 1 | 1 | 0 | 2 | 0 | 2 |
| 1785: | 1 | 1 | 0 | 2 | 1 | 3 | 0 | 1 |
| 1793: | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 |
| 1801: | 0 | 0 | 2 | 1 | 0 | 3 | 1 | 1 |
| 1809: | 2 | 0 | 1 | 0 | 1 | 1 | 0 | 2 |
| 1817: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 |
| 1825: | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 |
| 1833: | 1 | 1 | 0 | 0 | 1 | 2 | 3 | 0 |
| 1841: | 0 | 1 | 1 | 2 | 3 | 0 | 3 | 3 |
| 1849: | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 |
| 1857: | 0 | 1 | 2 | 2 | 2 | 2 | 4 | 2 |
| 1865: | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 1 |
| 1873: | 3 | 1 | 2 | 1 | 1 | 2 | 0 | 4 |
| 1881: | 0 | 1 | 4 | 2 | 5 | 1 | 2 | 2 |
| 1889: | 4 | 1 | 0 | 0 | 2 | 0 | 0 | 0 |
| 1897: | 0 | 1 | 2 | 1 | 1 | 1 | 4 | 4 |
| 1905: | 0 | 2 | 0 | 1 | 3 | 3 | 0 | 2 |
| 1913: | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 3 |
| 1921: | 0 | 0 | 2 | 4 | 1 | 2 | 0 | 0 |
| 1929: | 0 | 1 | 0 | 1 | 1 | 2 | 2 | 0 |
| 1937: | 2 | 1 | 2 | 1 | 1 | 0 | 2 | 2 |
| 1945: | 3 | 0 | 0 | 0 | 3 | 1 | 0 | 2 |
| 1953: | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 |
| 1961: | 5 | 3 | 2 | 2 | 0 | 0 | 0 | 0 |
| 1969: | 0 | 4 | 2 | 1 | 0 | 0 | 0 | 1 |
| 1977: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 3 |
| 1985: | 0 | 0 | 3 | 1 | 1 | 0 | 1 | 2 |
| 1993: | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 0 |
| 2001: | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| 2009: | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 0 |
| 2017: | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2025: | 1 | 1 | 0 | 0 | 0 | 0 | 3 | 1 |
| 2033: | 1 | 0 | 1 | 1 | 0 | 0 | 5 | 0 |
| 2041: | 1 | 2 | 3 | 1 | 2 | 1 | 2 | 1 |
| 2049: | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 |
| 2057: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 2065: | 0 | 3 | 1 | 3 | 0 | 1 | 0 | 1 |
| 2073: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| 2081: | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 2089: | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 0 | 1 | 1 | 0 | 3 | 1 | 2 | 8 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 1 | 1 | 2 | 2 | 1 | 1 | 0 | 1 |
| 2113: | 0 | 2 | 1 | 1 | 2 | 2 | 3 | 1 |
| 2121: | 2 | 1 | 0 | 1 | 1 | 2 | 0 | 0 |
| 2129: | 0 | 1 | 0 | 1 | 3 | 1 | 2 | 0 |
| 2137: | 2 | 1 | 0 | 0 | 2 | 0 | 3 | 2 |
| 2145: | 2 | 3 | 0 | 0 | 1 | 1 | 0 | 1 |
| 2153: | 0 | 0 | 1 | 2 | 1 | 2 | 1 | 0 |
| 2161: | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 3 |
| 2169: | 3 | 3 | 1 | 1 | 3 | 0 | 1 | 3 |
| 2177: | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 2185: | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 2193: | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 2201: | 1 | 7 | 10 | 3 | 2 | 2 | 1 | 2 |
| 2209: | 2 | 0 | 0 | 2 | 0 | 4 | 1 | 0 |
| 2217: | 2 | 1 | 1 | 0 | 3 | 1 | 1 | 2 |
| 2225: | 1 | 4 | 1 | 0 | 3 | 1 | 2 | 1 |
| 2233: | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 2241: | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 2 |
| 2249: | 3 | 3 | 1 | 0 | 1 | 0 | 0 | 3 |
| 2257: | 0 | 0 | 0 | 0 | 1 | 1 | 4 | 0 |
| 2265: | 3 | 1 | 0 | 0 | 1 | 2 | 1 | 0 |
| 2273: | 0 | 1 | 3 | 1 | 2 | 2 | 1 | 1 |
| 2281: | 2 | 0 | 2 | 0 | 0 | 3 | 2 | 2 |
| 2289: | 1 | 1 | 2 | 0 | 1 | 0 | 4 | 1 |
| 2297: | 3 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 2305: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 4 |
| 2313: | 0 | 1 | 0 | 2 | 0 | 2 | 1 | 0 |
| 2321: | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2329: | 0 | 1 | 1 | 3 | 1 | 0 | 1 | 3 |
| 2337: | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2345: | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 1 |
| 2353: | 1 | 1 | 2 | 1 | 1 | 3 | 1 | 0 |
| 2361: | 1 | 1 | 1 | 2 | 0 | 0 | 1 | 3 |
| 2369: | 4 | 5 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2377: | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 |
| 2385: | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2393: | 1 | 3 | 0 | 0 | 1 | 0 | 3 | 0 |
| 2401: | 2 | 1 | 3 | 1 | 1 | 1 | 0 | 0 |
| 2409: | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 0 |
| 2417: | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 3 |
| 2425: | 1 | 0 | 1 | 0 | 3 | 2 | 0 | 0 |
| 2433: | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 2 |
| 2441: | 0 | 0 | 1 | 0 | 1 | 1 | 3 | 0 |
| 2449: | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 |
| 2457: | 0 | 1 | 1 | 1 | 3 | 1 | 0 | 1 |
| 2465: | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 2473: | 2 | 0 | 1 | 0 | 2 | 1 | 1 | 1 |
| 2481: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2489: | 2 | 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2497: | 0 | 2 | 0 | 0 | 2 | 1 | 1 | 1 |
| 2505: | 1 | 0 | 0 | 0 | 2 | 2 | 0 | 0 |
| 2513: | 0 | 0 | 1 | 0 | 1 | 2 | 1 | 0 |
| 2521: | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 1 | 0 | 3 | 0 | 0 | 1 | 0 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2545: | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 |
| 2553: | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2561: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| 2569: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2577: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2585: | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |
| 2593: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2601: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 2609: | 0 | 1 | 8 | 21 | 25 | 34 | 12 | 2 |
| 2617: | 0 | 1 | 3 | 1 | 0 | 1 | 1 | 0 |
| 2625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2633: | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 0 |
| 2641: | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2649: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2665: | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0 |
| 2673: | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 2681: | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 1 |
| 2689: | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| 2697: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2705: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2713: | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2721: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2729: | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2737: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2745: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2753: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2761: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2769: | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 2777: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2785: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2793: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2801: | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2809: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2817: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2825: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2841: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2857: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2865: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| 2873: | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 1 |
| 2881: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2889: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2897: | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 0 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2913: | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 |
| 2921: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2929: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2945: | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2977: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| 2993: | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| 3001: | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 3009: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 3033: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3049: | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 0 |
| 3057: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3073: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3081: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3177: | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3193: | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3217: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3233: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3273: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 |
| 3281: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3305: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3353: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3385: | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-0612-01

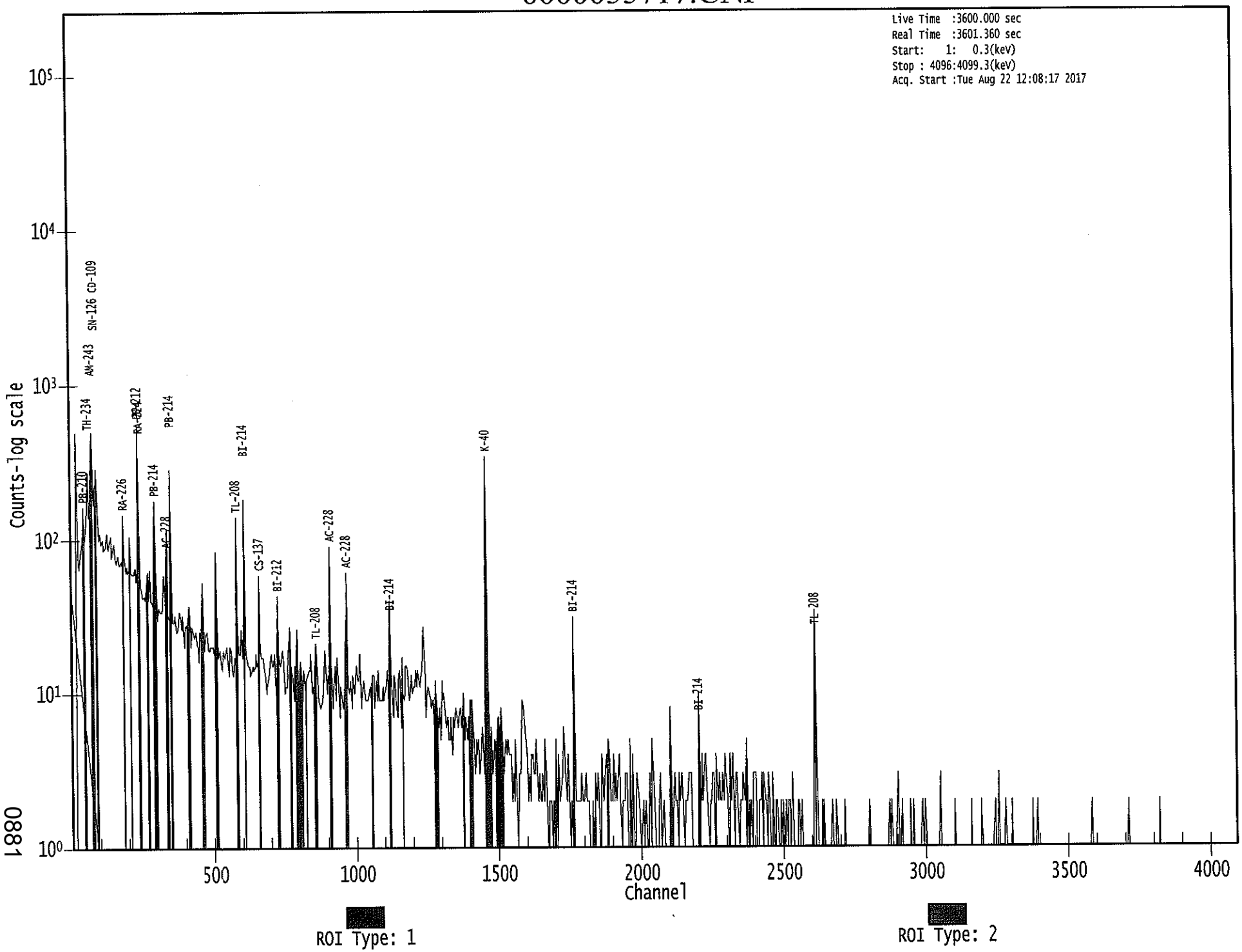
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3409: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3417: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3473: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3649: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3673: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 |
| 3713: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3721: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3729: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3753: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3769: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3793: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-0612-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3849: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3889: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3897: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3921: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 4041: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4065: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4089: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

# 0000055717.CNF




0081

Apex-Gamma

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-17 |
| Sample Description | : HTC-A03-S003-1218-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.829E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:46:55AM |
| Acquisition Started | : 8/22/2017 12:08:24PM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE2 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.2 seconds |
| Dead Time | : 0.03 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 29 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 8/19/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55718 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 1:09:02PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 63.89 | 64.21 | 0.0000 | 0.00 |
| 2 | 76.16 | 76.47 | 0.0000 | 0.00 |
| 3 | 88.22 | 88.52 | 0.0000 | 0.00 |
| 4 | 93.06 | 93.35 | 0.0000 | 0.00 |
| 5 | 153.75 | 153.98 | 0.0000 | 0.00 |
| 6 | 185.97 | 186.16 | 0.0000 | 0.00 |
| 7 | 209.24 | 209.41 | 0.0000 | 0.00 |
| 8 | 238.69 | 238.83 | 0.0000 | 0.00 |
| 9 | 241.93 | 242.07 | 0.0000 | 0.00 |
| 10 | 270.20 | 270.30 | 0.0000 | 0.00 |
| 11 | 277.23 | 277.32 | 0.0000 | 0.00 |
| 12 | 295.22 | 295.29 | 0.0000 | 0.00 |
| 13 | 299.85 | 299.92 | 0.0000 | 0.00 |
| 14 | 327.94 | 327.99 | 0.0000 | 0.00 |
| 15 | 338.15 | 338.18 | 0.0000 | 0.00 |
| 16 | 352.02 | 352.04 | 0.0000 | 0.00 |
| 17 | 463.45 | 463.35 | 0.0000 | 0.00 |
| 18 | 511.17 | 511.02 | 0.0000 | 0.00 |
| 19 | 583.37 | 583.15 | 0.0000 | 0.00 |
| 20 | 609.44 | 609.20 | 0.0000 | 0.00 |
| 21 | 727.05 | 726.69 | 0.0000 | 0.00 |
| 22 | 768.36 | 767.96 | 0.0000 | 0.00 |
| 23 | 795.43 | 795.00 | 0.0000 | 0.00 |
| 24 | 893.52 | 893.00 | 0.0000 | 0.00 |
| 25 | 911.55 | 911.01 | 0.0000 | 0.00 |
| 26 | 934.26 | 933.70 | 0.0000 | 0.00 |
| 27 | 969.59 | 969.00 | 0.0000 | 0.00 |
| 28 | 1000.78 | 1000.16 | 0.0000 | 0.00 |
| 29 | 1007.29 | 1006.67 | 0.0000 | 0.00 |
| 30 | 1120.54 | 1119.81 | 0.0000 | 0.00 |
| 31 | 1130.56 | 1129.83 | 0.0000 | 0.00 |
| 32 | 1238.20 | 1237.37 | 0.0000 | 0.00 |
| 33 | 1258.98 | 1258.13 | 0.0000 | 0.00 |
| 34 | 1267.59 | 1266.73 | 0.0000 | 0.00 |
| 35 | 1290.35 | 1289.48 | 0.0000 | 0.00 |
| 36 | 1347.75 | 1346.82 | 0.0000 | 0.00 |
| 37 | 1376.81 | 1375.86 | 0.0000 | 0.00 |
| 38 | 1461.27 | 1460.24 | 0.0000 | 0.00 |
| 39 | 1509.90 | 1508.83 | 0.0000 | 0.00 |
| 40 | 1541.02 | 1539.93 | 0.0000 | 0.00 |
| 41 | 1560.35 | 1559.25 | 0.0000 | 0.00 |
| 42 | 1563.13 | 1562.02 | 0.0000 | 0.00 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1581.19 | 1580.06 | 0.0000 | 0.00 |
| 44 | 1589.28 | 1588.14 | 0.0000 | 0.00 |
| 45 | 1593.13 | 1592.00 | 0.0000 | 0.00 |
| 46 | 1620.35 | 1619.19 | 0.0000 | 0.00 |
| 47 | 1625.63 | 1624.47 | 0.0000 | 0.00 |
| 48 | 1707.98 | 1706.76 | 0.0000 | 0.00 |
| 49 | 1720.11 | 1718.87 | 0.0000 | 0.00 |
| 50 | 1731.20 | 1729.96 | 0.0000 | 0.00 |
| 51 | 1764.75 | 1763.48 | 0.0000 | 0.00 |
| 52 | 1790.51 | 1789.22 | 0.0000 | 0.00 |
| 53 | 1812.29 | 1810.98 | 0.0000 | 0.00 |
| 54 | 1821.62 | 1820.30 | 0.0000 | 0.00 |
| 55 | 1888.51 | 1887.14 | 0.0000 | 0.00 |
| 56 | 1962.07 | 1960.65 | 0.0000 | 0.00 |
| 57 | 2103.17 | 2101.65 | 0.0000 | 0.00 |
| 58 | 2118.91 | 2117.38 | 0.0000 | 0.00 |
| 59 | 2170.53 | 2168.96 | 0.0000 | 0.00 |
| 60 | 2204.53 | 2202.94 | 0.0000 | 0.00 |
| 61 | 2286.43 | 2284.78 | 0.0000 | 0.00 |
| 62 | 2614.83 | 2612.96 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 1:09:02PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 63.89 | 60 - | 67 | 64.21 | 1.51E+02 | 107.26 | 1.82E+03 | 1.40 |
| | 2 | 76.16 | 72 - | 81 | 76.47 | 1.12E+03 | 139.89 | 2.11E+03 | 3.78 |
| | 3 | 88.22 | 86 - | 91 | 88.52 | 1.80E+02 | 93.41 | 1.60E+03 | 3.13 |
| | 4 | 93.06 | 91 - | 96 | 93.35 | 1.28E+02 | 89.43 | 1.42E+03 | 1.30 |
| | 5 | 153.75 | 151 - | 157 | 153.98 | 6.25E+01 | 70.89 | 8.69E+02 | 1.69 |
| | 6 | 185.97 | 183 - | 188 | 186.16 | 1.55E+02 | 61.83 | 6.34E+02 | 1.48 |
| | 7 | 209.24 | 206 - | 212 | 209.41 | 6.78E+01 | 62.18 | 6.52E+02 | 1.19 |
| M | 8 | 238.69 | 234 - | 246 | 238.83 | 7.26E+02 | 70.48 | 4.07E+02 | 1.60 |
| m | 9 | 241.93 | 234 - | 246 | 242.07 | 1.38E+02 | 51.84 | 3.55E+02 | 1.61 |
| M | 10 | 270.20 | 267 - | 283 | 270.30 | 8.62E+01 | 52.29 | 4.52E+02 | 2.22 |
| m | 11 | 277.23 | 267 - | 283 | 277.32 | 7.45E+01 | 50.89 | 3.85E+02 | 2.24 |
| M | 12 | 295.22 | 292 - | 304 | 295.29 | 2.87E+02 | 47.85 | 2.83E+02 | 1.56 |
| m | 13 | 299.85 | 292 - | 304 | 299.92 | 6.67E+01 | 43.19 | 3.02E+02 | 2.09 |
| | 14 | 327.94 | 325 - | 332 | 327.99 | 6.28E+01 | 51.34 | 4.00E+02 | 2.99 |
| | 15 | 338.15 | 333 - | 343 | 338.18 | 1.76E+02 | 69.13 | 5.40E+02 | 1.95 |
| | 16 | 352.02 | 348 - | 355 | 352.04 | 4.03E+02 | 59.63 | 3.24E+02 | 1.32 |
| | 17 | 463.45 | 460 - | 467 | 463.35 | 6.17E+01 | 40.20 | 2.29E+02 | 2.00 |
| | 18 | 511.17 | 507 - | 517 | 511.02 | 1.90E+02 | 53.11 | 2.75E+02 | 2.24 |
| | 19 | 583.37 | 578 - | 587 | 583.15 | 2.99E+02 | 52.62 | 2.24E+02 | 1.43 |
| | 20 | 609.44 | 605 - | 612 | 609.20 | 3.21E+02 | 48.12 | 1.71E+02 | 1.85 |
| | 21 | 727.05 | 721 - | 733 | 726.69 | 5.94E+01 | 44.20 | 2.03E+02 | 2.33 |
| | 22 | 768.36 | 766 - | 770 | 767.96 | 2.36E+01 | 21.26 | 7.88E+01 | 1.34 |
| | 23 | 795.43 | 791 - | 801 | 795.00 | 5.30E+01 | 36.56 | 1.54E+02 | 2.49 |
| | 24 | 893.52 | 889 - | 897 | 893.00 | 2.20E+01 | 25.94 | 9.00E+01 | 4.55 |
| | 25 | 911.55 | 906 - | 915 | 911.01 | 1.72E+02 | 41.69 | 1.50E+02 | 1.67 |
| | 26 | 934.26 | 930 - | 938 | 933.70 | 2.90E+01 | 26.48 | 9.00E+01 | 2.17 |
| | 27 | 969.59 | 966 - | 974 | 969.00 | 7.86E+01 | 40.30 | 1.79E+02 | 1.99 |
| | 28 | 1000.78 | 996 - | 1003 | 1000.16 | 2.88E+01 | 22.72 | 6.43E+01 | 1.44 |
| | 29 | 1007.29 | 1005 - | 1009 | 1006.67 | 1.27E+01 | 15.69 | 4.47E+01 | 3.09 |
| | 30 | 1120.54 | 1115 - | 1123 | 1119.81 | 9.71E+01 | 31.19 | 8.97E+01 | 2.18 |
| | 31 | 1130.56 | 1125 - | 1134 | 1129.83 | 2.34E+01 | 29.36 | 1.09E+02 | 3.70 |
| | 32 | 1238.20 | 1233 - | 1241 | 1237.37 | 4.45E+01 | 30.63 | 1.17E+02 | 4.83 |
| | 33 | 1258.98 | 1255 - | 1261 | 1258.13 | 1.80E+01 | 18.97 | 5.19E+01 | 3.66 |
| | 34 | 1267.59 | 1264 - | 1270 | 1266.73 | 1.31E+01 | 15.57 | 3.38E+01 | 1.11 |
| | 35 | 1290.35 | 1286 - | 1292 | 1289.48 | 1.60E+01 | 17.76 | 4.59E+01 | 2.21 |
| | 36 | 1347.75 | 1344 - | 1350 | 1346.82 | 1.06E+01 | 13.33 | 2.49E+01 | 1.43 |
| | 37 | 1376.81 | 1372 - | 1380 | 1375.86 | 2.25E+01 | 16.29 | 2.70E+01 | 5.31 |
| | 38 | 1461.27 | 1454 - | 1464 | 1460.24 | 8.99E+02 | 61.36 | 2.34E+01 | 2.49 |
| | 39 | 1509.90 | 1506 - | 1514 | 1508.83 | 1.32E+01 | 14.19 | 2.37E+01 | 3.19 |
| | 40 | 1541.02 | 1535 - | 1544 | 1539.93 | 2.05E+01 | 10.82 | 5.00E+00 | 6.84 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| M | 41 | 1560.35 | 1558 - | 1564 | 1559.25 | 6.47E+00 | 5.70 | 4.53E+00 | 3.58 |
| m | 42 | 1563.13 | 1558 - | 1564 | 1562.02 | 7.99E+00 | 8.83 | 3.47E+00 | 3.45 |
| M | 43 | 1581.19 | 1573 - | 1594 | 1580.06 | 1.25E+01 | 15.39 | 2.20E+01 | 3.61 |
| m | 44 | 1589.28 | 1573 - | 1594 | 1588.14 | 1.71E+01 | 17.23 | 2.20E+01 | 3.62 |
| m | 45 | 1593.13 | 1573 - | 1594 | 1592.00 | 1.83E+01 | 12.85 | 1.40E+01 | 2.47 |
| | 46 | 1620.35 | 1617 - | 1621 | 1619.19 | 9.50E+00 | 10.27 | 1.50E+01 | 2.45 |
| | 47 | 1625.63 | 1622 - | 1627 | 1624.47 | 1.08E+01 | 10.00 | 1.04E+01 | 1.49 |
| | 48 | 1707.98 | 1704 - | 1709 | 1706.76 | 8.65E+00 | 7.00 | 2.70E+00 | 3.50 |
| | 49 | 1720.11 | 1715 - | 1722 | 1718.87 | 8.00E+00 | 7.48 | 4.00E+00 | 3.72 |
| | 50 | 1731.20 | 1725 - | 1734 | 1729.96 | 1.36E+01 | 12.61 | 1.48E+01 | 1.98 |
| | 51 | 1764.75 | 1759 - | 1767 | 1763.48 | 6.98E+01 | 17.56 | 4.43E+00 | 2.95 |
| | 52 | 1790.51 | 1784 - | 1794 | 1789.22 | 1.80E+01 | 8.49 | 0.00E+00 | 6.08 |
| | 53 | 1812.29 | 1808 - | 1814 | 1810.98 | 8.15E+00 | 9.42 | 9.69E+00 | 2.04 |
| | 54 | 1821.62 | 1817 - | 1823 | 1820.30 | 6.22E+00 | 7.78 | 5.56E+00 | 1.04 |
| | 55 | 1888.51 | 1884 - | 1889 | 1887.14 | 6.00E+00 | 7.35 | 6.00E+00 | 1.79 |
| | 56 | 1962.07 | 1956 - | 1963 | 1960.65 | 6.00E+00 | 8.49 | 8.00E+00 | 1.06 |
| | 57 | 2103.17 | 2098 - | 2105 | 2101.65 | 1.92E+01 | 10.00 | 3.57E+00 | 5.68 |
| | 58 | 2118.91 | 2111 - | 2124 | 2117.38 | 1.30E+01 | 13.34 | 1.40E+01 | 2.95 |
| | 59 | 2170.53 | 2167 - | 2172 | 2168.96 | 8.00E+00 | 7.00 | 4.00E+00 | 2.58 |
| | 60 | 2204.53 | 2199 - | 2206 | 2202.94 | 1.26E+01 | 9.80 | 6.88E+00 | 2.77 |
| | 61 | 2286.43 | 2278 - | 2288 | 2284.78 | 9.88E+00 | 9.07 | 6.23E+00 | 3.52 |
| | 62 | 2614.83 | 2606 - | 2617 | 2612.96 | 9.80E+01 | 19.80 | 0.00E+00 | 2.96 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 1:09:02PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 1 | 63.89 | 60 - | 67 | 1.51E+02 | 107.26 | 1.82E+03 | 8.58E+01 |
| 2 | 76.16 | 72 - | 81 | 1.12E+03 | 139.89 | 2.11E+03 | 1.01E+02 |
| 3 | 88.22 | 86 - | 91 | 1.80E+02 | 93.41 | 1.60E+03 | 7.35E+01 |
| 4 | 93.06 | 91 - | 96 | 1.28E+02 | 89.43 | 1.42E+03 | 7.11E+01 |
| 5 | 153.75 | 151 - | 157 | 6.25E+01 | 70.89 | 8.69E+02 | 5.68E+01 |
| 6 | 185.97 | 183 - | 188 | 1.55E+02 | 61.83 | 6.34E+02 | 4.65E+01 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 7 | 209.24 | 206 - | 212 | 6.78E+01 | 62.18 | 6.52E+02 | 4.93E+01 |
| M | 8 | 238.69 | 234 - | 246 | 7.26E+02 | 70.48 | 4.07E+02 | 3.32E+01 |
| m | 9 | 241.93 | 234 - | 246 | 1.38E+02 | 51.84 | 3.55E+02 | 3.10E+01 |
| M | 10 | 270.20 | 267 - | 283 | 8.62E+01 | 52.29 | 4.52E+02 | 3.50E+01 |
| m | 11 | 277.23 | 267 - | 283 | 7.45E+01 | 50.89 | 3.85E+02 | 3.23E+01 |
| M | 12 | 295.22 | 292 - | 304 | 2.87E+02 | 47.85 | 2.83E+02 | 2.76E+01 |
| m | 13 | 299.85 | 292 - | 304 | 6.67E+01 | 43.19 | 3.02E+02 | 2.86E+01 |
| | 14 | 327.94 | 325 - | 332 | 6.28E+01 | 51.34 | 4.00E+02 | 4.01E+01 |
| | 15 | 338.15 | 333 - | 343 | 1.76E+02 | 69.13 | 5.40E+02 | 5.25E+01 |
| | 16 | 352.02 | 348 - | 355 | 4.03E+02 | 59.63 | 3.24E+02 | 3.62E+01 |
| | 17 | 463.45 | 460 - | 467 | 6.17E+01 | 40.20 | 2.29E+02 | 3.04E+01 |
| | 18 | 511.17 | 507 - | 517 | 1.90E+02 | 53.11 | 2.75E+02 | 3.73E+01 |
| | 19 | 583.37 | 578 - | 587 | 2.99E+02 | 52.62 | 2.24E+02 | 3.26E+01 |
| | 20 | 609.44 | 605 - | 612 | 3.21E+02 | 48.12 | 1.71E+02 | 2.64E+01 |
| | 21 | 727.05 | 721 - | 733 | 5.94E+01 | 44.20 | 2.03E+02 | 3.41E+01 |
| | 22 | 768.36 | 766 - | 770 | 2.36E+01 | 21.26 | 7.88E+01 | 1.55E+01 |
| | 23 | 795.43 | 791 - | 801 | 5.30E+01 | 36.56 | 1.54E+02 | 2.76E+01 |
| | 24 | 893.52 | 889 - | 897 | 2.20E+01 | 25.94 | 9.00E+01 | 1.99E+01 |
| | 25 | 911.55 | 906 - | 915 | 1.72E+02 | 41.69 | 1.50E+02 | 2.66E+01 |
| | 26 | 934.26 | 930 - | 938 | 2.90E+01 | 26.48 | 9.00E+01 | 1.99E+01 |
| | 27 | 969.59 | 966 - | 974 | 7.86E+01 | 40.30 | 1.79E+02 | 2.97E+01 |
| | 28 | 1000.78 | 996 - | 1003 | 2.88E+01 | 22.72 | 6.43E+01 | 1.65E+01 |
| | 29 | 1007.29 | 1005 - | 1009 | 1.27E+01 | 15.69 | 4.47E+01 | 1.15E+01 |
| | 30 | 1120.54 | 1115 - | 1123 | 9.71E+01 | 31.19 | 8.97E+01 | 1.99E+01 |
| | 31 | 1130.56 | 1125 - | 1134 | 2.34E+01 | 29.36 | 1.09E+02 | 2.28E+01 |
| | 32 | 1238.20 | 1233 - | 1241 | 4.45E+01 | 30.63 | 1.17E+02 | 2.27E+01 |
| | 33 | 1258.98 | 1255 - | 1261 | 1.80E+01 | 18.97 | 5.19E+01 | 1.39E+01 |
| | 34 | 1267.59 | 1264 - | 1270 | 1.31E+01 | 15.57 | 3.38E+01 | 1.13E+01 |
| | 35 | 1290.35 | 1286 - | 1292 | 1.60E+01 | 17.76 | 4.59E+01 | 1.30E+01 |
| | 36 | 1347.75 | 1344 - | 1350 | 1.06E+01 | 13.33 | 2.49E+01 | 9.57E+00 |
| | 37 | 1376.81 | 1372 - | 1380 | 2.25E+01 | 16.29 | 2.70E+01 | 1.09E+01 |
| | 38 | 1461.27 | 1454 - | 1464 | 8.99E+02 | 61.36 | 2.34E+01 | 1.06E+01 |
| | 39 | 1509.90 | 1506 - | 1514 | 1.32E+01 | 14.19 | 2.37E+01 | 1.00E+01 |
| | 40 | 1541.02 | 1535 - | 1544 | 2.05E+01 | 10.82 | 5.00E+00 | 4.86E+00 |
| M | 41 | 1560.35 | 1558 - | 1564 | 6.47E+00 | 5.70 | 4.53E+00 | 3.50E+00 |
| m | 42 | 1563.13 | 1558 - | 1564 | 7.99E+00 | 8.83 | 3.47E+00 | 3.06E+00 |
| M | 43 | 1581.19 | 1573 - | 1594 | 1.25E+01 | 15.39 | 2.20E+01 | 7.71E+00 |
| m | 44 | 1589.28 | 1573 - | 1594 | 1.71E+01 | 17.23 | 2.20E+01 | 7.71E+00 |
| m | 45 | 1593.13 | 1573 - | 1594 | 1.83E+01 | 12.85 | 1.40E+01 | 6.15E+00 |
| | 46 | 1620.35 | 1617 - | 1621 | 9.50E+00 | 10.27 | 1.50E+01 | 6.75E+00 |
| | 47 | 1625.63 | 1622 - | 1627 | 1.08E+01 | 10.00 | 1.04E+01 | 6.19E+00 |
| | 48 | 1707.98 | 1704 - | 1709 | 8.65E+00 | 7.00 | 2.70E+00 | 3.12E+00 |
| | 49 | 1720.11 | 1715 - | 1722 | 8.00E+00 | 7.48 | 4.00E+00 | 4.03E+00 |
| | 50 | 1731.20 | 1725 - | 1734 | 1.36E+01 | 12.61 | 1.48E+01 | 8.40E+00 |
| | 51 | 1764.75 | 1759 - | 1767 | 6.98E+01 | 17.56 | 4.43E+00 | 4.44E+00 |
| | 52 | 1790.51 | 1784 - | 1794 | 1.80E+01 | 8.49 | 0.00E+00 | 0.00E+00 |
| | 53 | 1812.29 | 1808 - | 1814 | 8.15E+00 | 9.42 | 9.69E+00 | 6.16E+00 |
| | 54 | 1821.62 | 1817 - | 1823 | 6.22E+00 | 7.78 | 5.56E+00 | 4.91E+00 |
| | 55 | 1888.51 | 1884 - | 1889 | 6.00E+00 | 7.35 | 6.00E+00 | 4.50E+00 |
| | 56 | 1962.07 | 1956 - | 1963 | 6.00E+00 | 8.49 | 8.00E+00 | 5.70E+00 |
| | 57 | 2103.17 | 2098 - | 2105 | 1.92E+01 | 10.00 | 3.57E+00 | 3.95E+00 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 58 | 2118.91 | 2111 - | 2124 | 1.30E+01 | 13.34 | 1.40E+01 | 9.23E+00 |
| 59 | 2170.53 | 2167 - | 2172 | 8.00E+00 | 7.00 | 4.00E+00 | 3.39E+00 |
| 60 | 2204.53 | 2199 - | 2206 | 1.26E+01 | 9.80 | 6.88E+00 | 5.56E+00 |
| 61 | 2286.43 | 2278 - | 2288 | 9.88E+00 | 9.07 | 6.23E+00 | 5.37E+00 |
| 62 | 2614.83 | 2606 - | 2617 | 9.80E+01 | 19.80 | 0.00E+00 | 0.00E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 1:09:02PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 63.89 | 60 - | 67 | 64.21 | 1.51E+02 | 107.26 | 1.82E+03 | TH-234 |
| | 2 | 76.16 | 72 - | 81 | 76.47 | 1.12E+03 | 139.89 | 2.11E+03 | ..... |
| | 3 | 88.22 | 86 - | 91 | 88.52 | 1.80E+02 | 93.41 | 1.60E+03 | LU-176 |
| | | | | | | | | | CD-109 |
| | | | | | | | | | SN-126 |
| | 4 | 93.06 | 91 - | 96 | 93.35 | 1.28E+02 | 89.43 | 1.42E+03 | GA-67 |
| | 5 | 153.75 | 151 - | 157 | 153.98 | 6.25E+01 | 70.89 | 8.69E+02 | CS-136 |
| | 6 | 185.97 | 183 - | 188 | 186.16 | 1.55E+02 | 61.83 | 6.34E+02 | RA-226 |
| | 7 | 209.24 | 206 - | 212 | 209.41 | 6.78E+01 | 62.18 | 6.52E+02 | GA-67 |
| | | | | | | | | | CM-243 |
| M | 8 | 238.69 | 234 - | 246 | 238.83 | 7.26E+02 | 70.48 | 4.07E+02 | PB-212 |
| m | 9 | 241.93 | 234 - | 246 | 242.07 | 1.38E+02 | 51.84 | 3.55E+02 | RA-224 |
| M | 10 | 270.20 | 267 - | 283 | 270.30 | 8.62E+01 | 52.29 | 4.52E+02 | ..... |
| m | 11 | 277.23 | 267 - | 283 | 277.32 | 7.45E+01 | 50.89 | 3.85E+02 | CM-243 |
| | | | | | | | | | NP-239 |
| M | 12 | 295.22 | 292 - | 304 | 295.29 | 2.87E+02 | 47.85 | 2.83E+02 | PB-214 |
| m | 13 | 299.85 | 292 - | 304 | 299.92 | 6.67E+01 | 43.19 | 3.02E+02 | BI-210M |
| | | | | | | | | | PB-212 |
| | | | | | | | | | GA-67 |
| | 14 | 327.94 | 325 - | 332 | 327.99 | 6.28E+01 | 51.34 | 4.00E+02 | LA-140 |
| | 15 | 338.15 | 333 - | 343 | 338.18 | 1.76E+02 | 69.13 | 5.40E+02 | AC-228 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 16 | 352.02 | 348 - | 355 | 352.04 | 4.03E+02 | 59.63 | 3.24E+02 | PB-214 |
| | 17 | 463.45 | 460 - | 467 | 463.35 | 6.17E+01 | 40.20 | 2.29E+02 | SB-125 |
| | 18 | 511.17 | 507 - | 517 | 511.02 | 1.90E+02 | 53.11 | 2.75E+02 | ..... |
| | 19 | 583.37 | 578 - | 587 | 583.15 | 2.99E+02 | 52.62 | 2.24E+02 | TL-208 |
| | 20 | 609.44 | 605 - | 612 | 609.20 | 3.21E+02 | 48.12 | 1.71E+02 | BI-214 |
| | 21 | 727.05 | 721 - | 733 | 726.69 | 5.94E+01 | 44.20 | 2.03E+02 | BI-212 |
| | 22 | 768.36 | 766 - | 770 | 767.96 | 2.36E+01 | 21.26 | 7.88E+01 | ..... |
| | 23 | 795.43 | 791 - | 801 | 795.00 | 5.30E+01 | 36.56 | 1.54E+02 | CS-134 |
| | 24 | 893.52 | 889 - | 897 | 893.00 | 2.20E+01 | 25.94 | 9.00E+01 | ..... |
| | 25 | 911.55 | 906 - | 915 | 911.01 | 1.72E+02 | 41.69 | 1.50E+02 | TL-204<br>AC-228 |
| | 26 | 934.26 | 930 - | 938 | 933.70 | 2.90E+01 | 26.48 | 9.00E+01 | ..... |
| | 27 | 969.59 | 966 - | 974 | 969.00 | 7.86E+01 | 40.30 | 1.79E+02 | AC-228 |
| | 28 | 1000.78 | 996 - | 1003 | 1000.16 | 2.88E+01 | 22.72 | 6.43E+01 | PA-234M |
| | 29 | 1007.29 | 1005 - | 1009 | 1006.67 | 1.27E+01 | 15.69 | 4.47E+01 | ..... |
| | 30 | 1120.54 | 1115 - | 1123 | 1119.81 | 9.71E+01 | 31.19 | 8.97E+01 | SC-46<br>BI-214<br>TA-182 |
| | 31 | 1130.56 | 1125 - | 1134 | 1129.83 | 2.34E+01 | 29.36 | 1.09E+02 | I-135 |
| | 32 | 1238.20 | 1233 - | 1241 | 1237.37 | 4.45E+01 | 30.63 | 1.17E+02 | CO-56 |
| | 33 | 1258.98 | 1255 - | 1261 | 1258.13 | 1.80E+01 | 18.97 | 5.19E+01 | ..... |
| | 34 | 1267.59 | 1264 - | 1270 | 1266.73 | 1.31E+01 | 15.57 | 3.38E+01 | ..... |
| | 35 | 1290.35 | 1286 - | 1292 | 1289.48 | 1.60E+01 | 17.76 | 4.59E+01 | ..... |
| | 36 | 1347.75 | 1344 - | 1350 | 1346.82 | 1.06E+01 | 13.33 | 2.49E+01 | ..... |
| | 37 | 1376.81 | 1372 - | 1380 | 1375.86 | 2.25E+01 | 16.29 | 2.70E+01 | ..... |
| | 38 | 1461.27 | 1454 - | 1464 | 1460.24 | 8.99E+02 | 61.36 | 2.34E+01 | K-40 |
| | 39 | 1509.90 | 1506 - | 1514 | 1508.83 | 1.32E+01 | 14.19 | 2.37E+01 | ..... |
| | 40 | 1541.02 | 1535 - | 1544 | 1539.93 | 2.05E+01 | 10.82 | 5.00E+00 | ..... |
| M | 41 | 1560.35 | 1558 - | 1564 | 1559.25 | 6.47E+00 | 5.70 | 4.53E+00 | ..... |
| m | 42 | 1563.13 | 1558 - | 1564 | 1562.02 | 7.99E+00 | 8.83 | 3.47E+00 | ..... |
| M | 43 | 1581.19 | 1573 - | 1594 | 1580.06 | 1.25E+01 | 15.39 | 2.20E+01 | ..... |
| m | 44 | 1589.28 | 1573 - | 1594 | 1588.14 | 1.71E+01 | 17.23 | 2.20E+01 | ..... |
| m | 45 | 1593.13 | 1573 - | 1594 | 1592.00 | 1.83E+01 | 12.85 | 1.40E+01 | ..... |
| | 46 | 1620.35 | 1617 - | 1621 | 1619.19 | 9.50E+00 | 10.27 | 1.50E+01 | BI-212 |
| | 47 | 1625.63 | 1622 - | 1627 | 1624.47 | 1.08E+01 | 10.00 | 1.04E+01 | ..... |
| | 48 | 1707.98 | 1704 - | 1709 | 1706.76 | 8.65E+00 | 7.00 | 2.70E+00 | ..... |
| | 49 | 1720.11 | 1715 - | 1722 | 1718.87 | 8.00E+00 | 7.48 | 4.00E+00 | ..... |
| | 50 | 1731.20 | 1725 - | 1734 | 1729.96 | 1.36E+01 | 12.61 | 1.48E+01 | ..... |
| | 51 | 1764.75 | 1759 - | 1767 | 1763.48 | 6.98E+01 | 17.56 | 4.43E+00 | BI-214 |
| | 52 | 1790.51 | 1784 - | 1794 | 1789.22 | 1.80E+01 | 8.49 | 0.00E+00 | ..... |
| | 53 | 1812.29 | 1808 - | 1814 | 1810.98 | 8.15E+00 | 9.42 | 9.69E+00 | ..... |
| | 54 | 1821.62 | 1817 - | 1823 | 1820.30 | 6.22E+00 | 7.78 | 5.56E+00 | ..... |
| | 55 | 1888.51 | 1884 - | 1889 | 1887.14 | 6.00E+00 | 7.35 | 6.00E+00 | ..... |
| | 56 | 1962.07 | 1956 - | 1963 | 1960.65 | 6.00E+00 | 8.49 | 8.00E+00 | ..... |
| | 57 | 2103.17 | 2098 - | 2105 | 2101.65 | 1.92E+01 | 10.00 | 3.57E+00 | ..... |
| | 58 | 2118.91 | 2111 - | 2124 | 2117.38 | 1.30E+01 | 13.34 | 1.40E+01 | ..... |
| | 59 | 2170.53 | 2167 - | 2172 | 2168.96 | 8.00E+00 | 7.00 | 4.00E+00 | ..... |
| | 60 | 2204.53 | 2199 - | 2206 | 2202.94 | 1.26E+01 | 9.80 | 6.88E+00 | BI-214 |
| | 61 | 2286.43 | 2278 - | 2288 | 2284.78 | 9.88E+00 | 9.07 | 6.23E+00 | ..... |
| | 62 | 2614.83 | 2606 - | 2617 | 2612.96 | 9.80E+01 | 19.80 | 0.00E+00 | TL-208 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 1:09:02PM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 63.89 | 1.51E+02 | 107.26 | 2.40E-02 | 1.79E-03 |
| | 2 | 76.16 | 1.12E+03 | 139.89 | 2.63E-02 | 2.11E-03 |
| | 3 | 88.22 | 1.80E+02 | 93.41 | 2.70E-02 | 2.42E-03 |
| | 4 | 93.06 | 1.28E+02 | 89.43 | 2.70E-02 | 2.33E-03 |
| | 5 | 153.75 | 6.25E+01 | 70.89 | 2.27E-02 | 1.66E-03 |
| | 6 | 185.97 | 1.55E+02 | 61.83 | 2.03E-02 | 1.53E-03 |
| | 7 | 209.24 | 6.78E+01 | 62.18 | 1.88E-02 | 1.43E-03 |
| M | 8 | 238.69 | 7.26E+02 | 70.48 | 1.72E-02 | 1.30E-03 |
| m | 9 | 241.93 | 1.38E+02 | 51.84 | 1.71E-02 | 1.28E-03 |
| M | 10 | 270.20 | 8.62E+01 | 52.29 | 1.58E-02 | 1.16E-03 |
| m | 11 | 277.23 | 7.45E+01 | 50.89 | 1.55E-02 | 1.13E-03 |
| M | 12 | 295.22 | 2.87E+02 | 47.85 | 1.48E-02 | 1.10E-03 |
| m | 13 | 299.85 | 6.67E+01 | 43.19 | 1.47E-02 | 1.09E-03 |
| | 14 | 327.94 | 6.28E+01 | 51.34 | 1.38E-02 | 1.05E-03 |
| | 15 | 338.15 | 1.76E+02 | 69.13 | 1.35E-02 | 1.04E-03 |
| | 16 | 352.02 | 4.03E+02 | 59.63 | 1.31E-02 | 1.02E-03 |
| | 17 | 463.45 | 6.17E+01 | 40.20 | 1.06E-02 | 9.06E-04 |
| | 18 | 511.17 | 1.90E+02 | 53.11 | 9.87E-03 | 8.65E-04 |
| | 19 | 583.37 | 2.99E+02 | 52.62 | 8.90E-03 | 8.02E-04 |
| | 20 | 609.44 | 3.21E+02 | 48.12 | 8.60E-03 | 7.79E-04 |
| | 21 | 727.05 | 5.94E+01 | 44.20 | 7.47E-03 | 6.71E-04 |
| | 22 | 768.36 | 2.36E+01 | 21.26 | 7.14E-03 | 6.31E-04 |
| | 23 | 795.43 | 5.30E+01 | 36.56 | 6.94E-03 | 6.05E-04 |
| | 24 | 893.52 | 2.20E+01 | 25.94 | 6.31E-03 | 5.10E-04 |
| | 25 | 911.55 | 1.72E+02 | 41.69 | 6.21E-03 | 5.01E-04 |
| | 26 | 934.26 | 2.90E+01 | 26.48 | 6.08E-03 | 4.94E-04 |
| | 27 | 969.59 | 7.86E+01 | 40.30 | 5.90E-03 | 4.81E-04 |
| | 28 | 1000.78 | 2.88E+01 | 22.72 | 5.75E-03 | 4.70E-04 |
| | 29 | 1007.29 | 1.27E+01 | 15.69 | 5.72E-03 | 4.68E-04 |
| | 30 | 1120.54 | 9.71E+01 | 31.19 | 5.24E-03 | 4.29E-04 |
| | 31 | 1130.56 | 2.34E+01 | 29.36 | 5.21E-03 | 4.25E-04 |
| | 32 | 1238.20 | 4.45E+01 | 30.63 | 4.84E-03 | 4.16E-04 |
| | 33 | 1258.98 | 1.80E+01 | 18.97 | 4.78E-03 | 4.18E-04 |
| | 34 | 1267.59 | 1.31E+01 | 15.57 | 4.75E-03 | 4.19E-04 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 35 | 1290.35 | 1.60E+01 | 17.76 | 4.69E-03 | 4.21E-04 |
| | 36 | 1347.75 | 1.06E+01 | 13.33 | 4.53E-03 | 4.20E-04 |
| | 37 | 1376.81 | 2.25E+01 | 16.29 | 4.46E-03 | 4.12E-04 |
| | 38 | 1461.27 | 8.99E+02 | 61.36 | 4.26E-03 | 3.87E-04 |
| | 39 | 1509.90 | 1.32E+01 | 14.19 | 4.16E-03 | 3.73E-04 |
| | 40 | 1541.02 | 2.05E+01 | 10.82 | 4.10E-03 | 3.64E-04 |
| M | 41 | 1560.35 | 6.47E+00 | 5.70 | 4.07E-03 | 3.59E-04 |
| m | 42 | 1563.13 | 7.99E+00 | 8.83 | 4.06E-03 | 3.58E-04 |
| M | 43 | 1581.19 | 1.25E+01 | 15.39 | 4.03E-03 | 3.53E-04 |
| m | 44 | 1589.28 | 1.71E+01 | 17.23 | 4.01E-03 | 3.50E-04 |
| m | 45 | 1593.13 | 1.83E+01 | 12.85 | 4.01E-03 | 3.49E-04 |
| | 46 | 1620.35 | 9.50E+00 | 10.27 | 3.96E-03 | 3.42E-04 |
| | 47 | 1625.63 | 1.08E+01 | 10.00 | 3.95E-03 | 3.40E-04 |
| | 48 | 1707.98 | 8.65E+00 | 7.00 | 3.82E-03 | 3.16E-04 |
| | 49 | 1720.11 | 8.00E+00 | 7.48 | 3.81E-03 | 3.13E-04 |
| | 50 | 1731.20 | 1.36E+01 | 12.61 | 3.79E-03 | 3.09E-04 |
| | 51 | 1764.75 | 6.98E+01 | 17.56 | 3.75E-03 | 3.00E-04 |
| | 52 | 1790.51 | 1.80E+01 | 8.49 | 3.71E-03 | 2.92E-04 |
| | 53 | 1812.29 | 8.15E+00 | 9.42 | 3.69E-03 | 2.86E-04 |
| | 54 | 1821.62 | 6.22E+00 | 7.78 | 3.67E-03 | 2.83E-04 |
| | 55 | 1888.51 | 6.00E+00 | 7.35 | 3.60E-03 | 2.79E-04 |
| | 56 | 1962.07 | 6.00E+00 | 8.49 | 3.52E-03 | 2.79E-04 |
| | 57 | 2103.17 | 1.92E+01 | 10.00 | 3.41E-03 | 2.79E-04 |
| | 58 | 2118.91 | 1.30E+01 | 13.34 | 3.40E-03 | 2.79E-04 |
| | 59 | 2170.53 | 8.00E+00 | 7.00 | 3.36E-03 | 2.79E-04 |
| | 60 | 2204.53 | 1.26E+01 | 9.80 | 3.34E-03 | 2.79E-04 |
| | 61 | 2286.43 | 9.88E+00 | 9.07 | 3.30E-03 | 2.79E-04 |
| | 62 | 2614.83 | 9.80E+01 | 19.80 | 3.20E-03 | 2.79E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 1:09:02PM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055574.CNF

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|
| 1 | 63.89 | 1.51E+02 | 107.26 | 6.29E+01 | 1.34E+01 | 8.78E+01 | 1.08E+02 |
| 2 | 76.16 | 1.12E+03 | 139.89 | | | 1.12E+03 | 1.40E+02 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 3 | 88.22 | 1.80E+02 | 93.41 | | | 1.80E+02 | 9.34E+01 |
| | 4 | 93.06 | 1.28E+02 | 89.43 | 4.88E+01 | 1.30E+00 | 7.89E+01 | 8.94E+01 |
| | 5 | 153.75 | 6.25E+01 | 70.89 | | | 6.25E+01 | 7.09E+01 |
| | 6 | 185.97 | 1.55E+02 | 61.83 | 3.48E+01 | 7.32E+00 | 1.20E+02 | 6.23E+01 |
| | 7 | 209.24 | 6.78E+01 | 62.18 | | | 6.78E+01 | 6.22E+01 |
| M | 8 | 238.69 | 7.26E+02 | 70.48 | 7.09E+00 | 6.85E+00 | 7.19E+02 | 7.08E+01 |
| m | 9 | 241.93 | 1.38E+02 | 51.84 | | | 1.38E+02 | 5.18E+01 |
| M | 10 | 270.20 | 8.62E+01 | 52.29 | | | 8.62E+01 | 5.23E+01 |
| m | 11 | 277.23 | 7.45E+01 | 50.89 | | | 7.45E+01 | 5.09E+01 |
| M | 12 | 295.22 | 2.87E+02 | 47.85 | | | 2.87E+02 | 4.78E+01 |
| m | 13 | 299.85 | 6.67E+01 | 43.19 | | | 6.67E+01 | 4.32E+01 |
| | 14 | 327.94 | 6.28E+01 | 51.34 | | | 6.28E+01 | 5.13E+01 |
| | 15 | 338.15 | 1.76E+02 | 69.13 | | | 1.76E+02 | 6.91E+01 |
| | 16 | 352.02 | 4.03E+02 | 59.63 | 1.04E+01 | 5.08E+00 | 3.93E+02 | 5.98E+01 |
| | 17 | 463.45 | 6.17E+01 | 40.20 | | | 6.17E+01 | 4.02E+01 |
| | 18 | 511.17 | 1.90E+02 | 53.11 | 7.08E+01 | 4.94E+00 | 1.19E+02 | 5.33E+01 |
| | 19 | 583.37 | 2.99E+02 | 52.62 | 5.65E+00 | 3.57E+00 | 2.93E+02 | 5.27E+01 |
| | 20 | 609.44 | 3.21E+02 | 48.12 | 1.07E+01 | 3.96E+00 | 3.11E+02 | 4.83E+01 |
| | 21 | 727.05 | 5.94E+01 | 44.20 | | | 5.94E+01 | 4.42E+01 |
| | 22 | 768.36 | 2.36E+01 | 21.26 | | | 2.36E+01 | 2.13E+01 |
| | 23 | 795.43 | 5.30E+01 | 36.56 | | | 5.30E+01 | 3.66E+01 |
| | 24 | 893.52 | 2.20E+01 | 25.94 | | | 2.20E+01 | 2.59E+01 |
| | 25 | 911.55 | 1.72E+02 | 41.69 | 2.63E+00 | 2.49E+00 | 1.69E+02 | 4.18E+01 |
| | 26 | 934.26 | 2.90E+01 | 26.48 | | | 2.90E+01 | 2.65E+01 |
| | 27 | 969.59 | 7.86E+01 | 40.30 | | | 7.86E+01 | 4.03E+01 |
| | 28 | 1000.78 | 2.88E+01 | 22.72 | | | 2.88E+01 | 2.27E+01 |
| | 29 | 1007.29 | 1.27E+01 | 15.69 | | | 1.27E+01 | 1.57E+01 |
| | 30 | 1120.54 | 9.71E+01 | 31.19 | 2.45E+00 | 2.38E+00 | 9.47E+01 | 3.13E+01 |
| | 31 | 1130.56 | 2.34E+01 | 29.36 | | | 2.34E+01 | 2.94E+01 |
| | 32 | 1238.20 | 4.45E+01 | 30.63 | | | 4.45E+01 | 3.06E+01 |
| | 33 | 1258.98 | 1.80E+01 | 18.97 | | | 1.80E+01 | 1.90E+01 |
| | 34 | 1267.59 | 1.31E+01 | 15.57 | | | 1.31E+01 | 1.56E+01 |
| | 35 | 1290.35 | 1.60E+01 | 17.76 | | | 1.60E+01 | 1.78E+01 |
| | 36 | 1347.75 | 1.06E+01 | 13.33 | | | 1.06E+01 | 1.33E+01 |
| | 37 | 1376.81 | 2.25E+01 | 16.29 | | | 2.25E+01 | 1.63E+01 |
| | 38 | 1461.27 | 8.99E+02 | 61.36 | 5.90E+00 | 2.63E+00 | 8.93E+02 | 6.14E+01 |
| | 39 | 1509.90 | 1.32E+01 | 14.19 | | | 1.32E+01 | 1.42E+01 |
| | 40 | 1541.02 | 2.05E+01 | 10.82 | | | 2.05E+01 | 1.08E+01 |
| M | 41 | 1560.35 | 6.47E+00 | 5.70 | | | 6.47E+00 | 5.70E+00 |
| m | 42 | 1563.13 | 7.99E+00 | 8.83 | | | 7.99E+00 | 8.83E+00 |
| M | 43 | 1581.19 | 1.25E+01 | 15.39 | | | 1.25E+01 | 1.54E+01 |
| m | 44 | 1589.28 | 1.71E+01 | 17.23 | | | 1.71E+01 | 1.72E+01 |
| m | 45 | 1593.13 | 1.83E+01 | 12.85 | | | 1.83E+01 | 1.28E+01 |
| | 46 | 1620.35 | 9.50E+00 | 10.27 | | | 9.50E+00 | 1.03E+01 |
| | 47 | 1625.63 | 1.08E+01 | 10.00 | | | 1.08E+01 | 1.00E+01 |
| | 48 | 1707.98 | 8.65E+00 | 7.00 | | | 8.65E+00 | 7.00E+00 |
| | 49 | 1720.11 | 8.00E+00 | 7.48 | | | 8.00E+00 | 7.48E+00 |
| | 50 | 1731.20 | 1.36E+01 | 12.61 | | | 1.36E+01 | 1.26E+01 |
| | 51 | 1764.75 | 6.98E+01 | 17.56 | 3.33E+00 | 1.73E+00 | 6.65E+01 | 1.76E+01 |
| | 52 | 1790.51 | 1.80E+01 | 8.49 | | | 1.80E+01 | 8.49E+00 |
| | 53 | 1812.29 | 8.15E+00 | 9.42 | | | 8.15E+00 | 9.42E+00 |
| | 54 | 1821.62 | 6.22E+00 | 7.78 | | | 6.22E+00 | 7.78E+00 |
| | 55 | 1888.51 | 6.00E+00 | 7.35 | | | 6.00E+00 | 7.35E+00 |
| | 56 | 1962.07 | 6.00E+00 | 8.49 | | | 6.00E+00 | 8.49E+00 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|
| 57 | 2103.17 | 1.92E+01 | 10.00 | | | 1.92E+01 | 1.00E+01 |
| 58 | 2118.91 | 1.30E+01 | 13.34 | | | 1.30E+01 | 1.33E+01 |
| 59 | 2170.53 | 8.00E+00 | 7.00 | | | 8.00E+00 | 7.00E+00 |
| 60 | 2204.53 | 1.26E+01 | 9.80 | | | 1.26E+01 | 9.80E+00 |
| 61 | 2286.43 | 9.88E+00 | 9.07 | | | 9.88E+00 | 9.07E+00 |
| 62 | 2614.83 | 9.80E+01 | 19.80 | 4.77E+00 | 1.52E+00 | 9.32E+01 | 1.99E+01 |

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 1:09:02PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055574.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 63.89 | 1.51E+02 | 107.26 | 6.29E+01 | 1.34E+01 | 8.78E+01 | 1.08E+02 |
| | 2 | 76.16 | 1.12E+03 | 139.89 | | | 1.12E+03 | 1.40E+02 |
| | 3 | 88.22 | 1.80E+02 | 93.41 | | | 1.80E+02 | 9.34E+01 |
| | 4 | 93.06 | 1.28E+02 | 89.43 | 4.88E+01 | 1.30E+00 | 7.89E+01 | 8.94E+01 |
| | 5 | 153.75 | 6.25E+01 | 70.89 | | | 6.25E+01 | 7.09E+01 |
| | 6 | 185.97 | 1.55E+02 | 61.83 | 3.48E+01 | 7.32E+00 | 1.20E+02 | 6.23E+01 |
| | 7 | 209.24 | 6.78E+01 | 62.18 | | | 6.78E+01 | 6.22E+01 |
| M | 8 | 238.69 | 7.26E+02 | 70.48 | 7.09E+00 | 6.85E+00 | 7.19E+02 | 7.08E+01 |
| m | 9 | 241.93 | 1.38E+02 | 51.84 | | | 1.38E+02 | 5.18E+01 |
| M | 10 | 270.20 | 8.62E+01 | 52.29 | | | 8.62E+01 | 5.23E+01 |
| m | 11 | 277.23 | 7.45E+01 | 50.89 | | | 7.45E+01 | 5.09E+01 |
| M | 12 | 295.22 | 2.87E+02 | 47.85 | | | 2.87E+02 | 4.78E+01 |
| m | 13 | 299.85 | 6.67E+01 | 43.19 | | | 6.67E+01 | 4.32E+01 |
| | 14 | 327.94 | 6.28E+01 | 51.34 | | | 6.28E+01 | 5.13E+01 |
| | 15 | 338.15 | 1.76E+02 | 69.13 | | | 1.76E+02 | 6.91E+01 |
| | 16 | 352.02 | 4.03E+02 | 59.63 | 1.04E+01 | 5.08E+00 | 3.93E+02 | 5.98E+01 |
| | 17 | 463.45 | 6.17E+01 | 40.20 | | | 6.17E+01 | 4.02E+01 |
| | 18 | 511.17 | 1.90E+02 | 53.11 | 7.08E+01 | 4.94E+00 | 1.19E+02 | 5.33E+01 |
| | 19 | 583.37 | 2.99E+02 | 52.62 | 5.65E+00 | 3.57E+00 | 2.93E+02 | 5.27E+01 |
| | 20 | 609.44 | 3.21E+02 | 48.12 | 1.07E+01 | 3.96E+00 | 3.11E+02 | 4.83E+01 |
| | 21 | 727.05 | 5.94E+01 | 44.20 | | | 5.94E+01 | 4.42E+01 |
| | 22 | 768.36 | 2.36E+01 | 21.26 | | | 2.36E+01 | 2.13E+01 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 23 | 795.43 | 5.30E+01 | 36.56 | | | 5.30E+01 | 3.66E+01 |
| | 24 | 893.52 | 2.20E+01 | 25.94 | | | 2.20E+01 | 2.59E+01 |
| | 25 | 911.55 | 1.72E+02 | 41.69 | 2.63E+00 | 2.49E+00 | 1.69E+02 | 4.18E+01 |
| | 26 | 934.26 | 2.90E+01 | 26.48 | | | 2.90E+01 | 2.65E+01 |
| | 27 | 969.59 | 7.86E+01 | 40.30 | | | 7.86E+01 | 4.03E+01 |
| | 28 | 1000.78 | 2.88E+01 | 22.72 | | | 2.88E+01 | 2.27E+01 |
| | 29 | 1007.29 | 1.27E+01 | 15.69 | | | 1.27E+01 | 1.57E+01 |
| | 30 | 1120.54 | 9.71E+01 | 31.19 | 2.45E+00 | 2.38E+00 | 9.47E+01 | 3.13E+01 |
| | 31 | 1130.56 | 2.34E+01 | 29.36 | | | 2.34E+01 | 2.94E+01 |
| | 32 | 1238.20 | 4.45E+01 | 30.63 | | | 4.45E+01 | 3.06E+01 |
| | 33 | 1258.98 | 1.80E+01 | 18.97 | | | 1.80E+01 | 1.90E+01 |
| | 34 | 1267.59 | 1.31E+01 | 15.57 | | | 1.31E+01 | 1.56E+01 |
| | 35 | 1290.35 | 1.60E+01 | 17.76 | | | 1.60E+01 | 1.78E+01 |
| | 36 | 1347.75 | 1.06E+01 | 13.33 | | | 1.06E+01 | 1.33E+01 |
| | 37 | 1376.81 | 2.25E+01 | 16.29 | | | 2.25E+01 | 1.63E+01 |
| | 38 | 1461.27 | 8.99E+02 | 61.36 | 5.90E+00 | 2.63E+00 | 8.93E+02 | 6.14E+01 |
| | 39 | 1509.90 | 1.32E+01 | 14.19 | | | 1.32E+01 | 1.42E+01 |
| | 40 | 1541.02 | 2.05E+01 | 10.82 | | | 2.05E+01 | 1.08E+01 |
| M | 41 | 1560.35 | 6.47E+00 | 5.70 | | | 6.47E+00 | 5.70E+00 |
| m | 42 | 1563.13 | 7.99E+00 | 8.83 | | | 7.99E+00 | 8.83E+00 |
| M | 43 | 1581.19 | 1.25E+01 | 15.39 | | | 1.25E+01 | 1.54E+01 |
| m | 44 | 1589.28 | 1.71E+01 | 17.23 | | | 1.71E+01 | 1.72E+01 |
| m | 45 | 1593.13 | 1.83E+01 | 12.85 | | | 1.83E+01 | 1.28E+01 |
| | 46 | 1620.35 | 9.50E+00 | 10.27 | | | 9.50E+00 | 1.03E+01 |
| | 47 | 1625.63 | 1.08E+01 | 10.00 | | | 1.08E+01 | 1.00E+01 |
| | 48 | 1707.98 | 8.65E+00 | 7.00 | | | 8.65E+00 | 7.00E+00 |
| | 49 | 1720.11 | 8.00E+00 | 7.48 | | | 8.00E+00 | 7.48E+00 |
| | 50 | 1731.20 | 1.36E+01 | 12.61 | | | 1.36E+01 | 1.26E+01 |
| | 51 | 1764.75 | 6.98E+01 | 17.56 | 3.33E+00 | 1.73E+00 | 6.65E+01 | 1.76E+01 |
| | 52 | 1790.51 | 1.80E+01 | 8.49 | | | 1.80E+01 | 8.49E+00 |
| | 53 | 1812.29 | 8.15E+00 | 9.42 | | | 8.15E+00 | 9.42E+00 |
| | 54 | 1821.62 | 6.22E+00 | 7.78 | | | 6.22E+00 | 7.78E+00 |
| | 55 | 1888.51 | 6.00E+00 | 7.35 | | | 6.00E+00 | 7.35E+00 |
| | 56 | 1962.07 | 6.00E+00 | 8.49 | | | 6.00E+00 | 8.49E+00 |
| | 57 | 2103.17 | 1.92E+01 | 10.00 | | | 1.92E+01 | 1.00E+01 |
| | 58 | 2118.91 | 1.30E+01 | 13.34 | | | 1.30E+01 | 1.33E+01 |
| | 59 | 2170.53 | 8.00E+00 | 7.00 | | | 8.00E+00 | 7.00E+00 |
| | 60 | 2204.53 | 1.26E+01 | 9.80 | | | 1.26E+01 | 9.80E+00 |
| | 61 | 2286.43 | 9.88E+00 | 9.07 | | | 9.88E+00 | 9.07E+00 |
| | 62 | 2614.83 | 9.80E+01 | 19.80 | 4.77E+00 | 1.52E+00 | 9.32E+01 | 1.99E+01 |

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

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.967 | 1460.81 | * | 10.67 | 2.16E+01 | 2.50E+00 |
| CD-109 | 0.994 | 88.03 | * | 3.72 | 2.29E+00 | 1.21E+00 |
| SN-126 | 0.934 | 87.57 | * | 37.00 | 1.98E-01 | 1.04E-01 |
| TL-208 | 0.884 | 583.14 | * | 30.22 | 1.20E+00 | 2.41E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 8.95E-01 | 2.06E-01 |
| BI-212 | 0.996 | 727.17 | * | 11.80 | 7.41E-01 | 5.55E-01 |
| | | 1620.62 | * | 2.75 | 9.59E-01 | 1.04E+00 |
| PB-212 | 0.999 | 238.63 | * | 44.60 | 1.03E+00 | 1.28E-01 |
| | | 300.09 | * | 3.41 | 1.46E+00 | 9.55E-01 |
| BI-214 | 0.994 | 609.31 | * | 46.30 | 8.58E-01 | 1.54E-01 |
| | | 1120.29 | * | 15.10 | 1.31E+00 | 4.48E-01 |
| | | 1764.49 | * | 15.80 | 1.23E+00 | 3.42E-01 |
| | | 2204.22 | * | 4.98 | 8.30E-01 | 6.51E-01 |
| PB-214 | 0.999 | 295.21 | * | 19.19 | 1.11E+00 | 2.02E-01 |
| | | 351.92 | * | 37.19 | 8.89E-01 | 1.52E-01 |
| RA-224 | 0.865 | 240.98 | * | 3.95 | 2.25E+00 | 8.62E-01 |
| RA-226 | 0.990 | 186.21 | * | 3.28 | 1.98E+00 | 3.77E+00 |
| AC-228 | 0.970 | 338.32 | * | 11.40 | 1.26E+00 | 5.05E-01 |
| | | 911.07 | * | 27.70 | 1.08E+00 | 2.81E-01 |
| | | 969.11 | * | 16.60 | 8.82E-01 | 4.58E-01 |
| PA-234M | 0.990 | 1001.03 | * | 0.92 | 5.99E+00 | 4.75E+00 |
| TH-234 | 0.945 | 63.29 | * | 3.80 | 1.06E+00 | 1.31E+00 |
| CM-243 | 0.357 | 209.75 | * | 3.29 | 1.21E+00 | 1.11E+00 |
| | | 228.14 | | 10.60 | | |
| | | 277.60 | * | 14.00 | 3.80E-01 | 2.61E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 1:09:02PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 2 | 76.16 | 3.12446E-01 | 6.22 | | |
| | 4 | 93.06 | 2.19137E-02 | 56.68 | Tol. | GA-67 |
| | 5 | 153.75 | 1.73689E-02 | 56.69 | Tol. | CS-136 |
| M | 10 | 270.20 | 2.39542E-02 | 30.32 | | |
| | 14 | 327.94 | 1.74472E-02 | 40.87 | | |
| | 17 | 463.45 | 1.71473E-02 | 32.56 | Sum | |
| | 18 | 511.17 | 3.29746E-02 | 22.47 | | |
| | 22 | 768.36 | 6.55423E-03 | 45.05 | Sum | |
| | 23 | 795.43 | 1.47308E-02 | 34.47 | Sum | |
| | 24 | 893.52 | 6.11111E-03 | 58.96 | | |
| | 26 | 934.26 | 8.05556E-03 | 45.65 | | |
| | 29 | 1007.29 | 3.51587E-03 | 61.99 | | |
| | 31 | 1130.56 | 6.48860E-03 | 62.84 | Tol. | I-135 |
| | 32 | 1238.20 | 1.23611E-02 | 34.42 | | |
| | 33 | 1258.98 | 5.01263E-03 | 52.55 | | |
| | 34 | 1267.59 | 3.63889E-03 | 59.44 | | |
| | 35 | 1290.35 | 4.45157E-03 | 55.40 | | |
| | 36 | 1347.75 | 2.93478E-03 | 63.10 | | |
| | 37 | 1376.81 | 6.25000E-03 | 36.21 | | |
| | 39 | 1509.90 | 3.65556E-03 | 53.90 | | |
| | 40 | 1541.02 | 5.69444E-03 | 26.38 | | |
| M | 41 | 1560.35 | 1.79745E-03 | 44.05 | | |
| m | 42 | 1563.13 | 2.22082E-03 | 55.23 | | |
| M | 43 | 1581.19 | 3.48058E-03 | 61.43 | | |
| m | 44 | 1589.28 | 4.75650E-03 | 50.32 | | |
| m | 45 | 1593.13 | 5.09013E-03 | 35.05 | D-Esc | |
| | 47 | 1625.63 | 3.00347E-03 | 46.24 | | |
| | 48 | 1707.98 | 2.40278E-03 | 40.46 | Sum | |
| | 49 | 1720.11 | 2.22222E-03 | 46.77 | | |
| | 50 | 1731.20 | 3.78307E-03 | 46.29 | | |
| | 52 | 1790.51 | 5.00000E-03 | 23.57 | | |
| | 53 | 1812.29 | 2.26496E-03 | 57.77 | | |
| | 54 | 1821.62 | 1.72840E-03 | 62.50 | | |
| | 55 | 1888.51 | 1.66667E-03 | 61.24 | | |
| | 56 | 1962.07 | 1.66667E-03 | 70.71 | | |
| | 57 | 2103.17 | 5.33730E-03 | 26.02 | S-Esc | |
| | 58 | 2118.91 | 3.61111E-03 | 51.31 | | |
| | 59 | 2170.53 | 2.22222E-03 | 43.75 | | |
| | 61 | 2286.43 | 2.74573E-03 | 45.88 | | |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.96 | 1460.81 | * | 10.67 | 2.16E+01 | 2.50E+00 |
| CD-109 | 0.99 | 88.03 | * | 3.72 | 2.29E+00 | 1.21E+00 |
| SN-126 | 0.93 | 87.57 | * | 37.00 | 1.98E-01 | 1.04E-01 |
| TL-208 | 0.88 | 583.14 | * | 30.22 | 1.20E+00 | 2.41E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 8.95E-01 | 2.06E-01 |
| BI-212 | 0.99 | 727.17 | * | 11.80 | 7.41E-01 | 5.55E-01 |
| | | 1620.62 | * | 2.75 | 9.59E-01 | 1.04E+00 |
| PB-212 | 0.99 | 238.63 | * | 44.60 | 1.03E+00 | 1.28E-01 |
| | | 300.09 | * | 3.41 | 1.46E+00 | 9.55E-01 |
| BI-214 | 0.99 | 609.31 | * | 46.30 | 8.58E-01 | 1.54E-01 |
| | | 1120.29 | * | 15.10 | 1.31E+00 | 4.48E-01 |
| | | 1764.49 | * | 15.80 | 1.23E+00 | 3.42E-01 |
| | | 2204.22 | * | 4.98 | 8.30E-01 | 6.51E-01 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 1.11E+00 | 2.02E-01 |
| | | 351.92 | * | 37.19 | 8.89E-01 | 1.52E-01 |
| RA-224 | 0.86 | 240.98 | * | 3.95 | 2.25E+00 | 8.62E-01 |
| RA-226 | 0.99 | 186.21 | * | 3.28 | 1.98E+00 | 3.77E+00 |
| AC-228 | 0.97 | 338.32 | * | 11.40 | 1.26E+00 | 5.05E-01 |
| | | 911.07 | * | 27.70 | 1.08E+00 | 2.81E-01 |
| | | 969.11 | * | 16.60 | 8.82E-01 | 4.58E-01 |
| PA-234M | 0.99 | 1001.03 | * | 0.92 | 5.99E+00 | 4.75E+00 |
| TH-234 | 0.94 | 63.29 | * | 3.80 | 1.06E+00 | 1.31E+00 |
| CM-243 | 0.35 | 209.75 | * | 3.29 | 1.21E+00 | 1.11E+00 |
| | | 228.14 | | 10.60 | | |
| | | 277.60 | * | 14.00 | 3.80E-01 | 2.61E-01 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.967 | 2.16E+01 | 2.50E+00 | |
| ? | CD-109 | 0.994 | 2.29E+00 | 1.21E+00 | |
| ? | SN-126 | 0.934 | 1.98E-01 | 1.04E-01 | |
| | TL-208 | 0.884 | 1.02E+00 | 1.57E-01 | |
| | BI-212 | 0.996 | 7.89E-01 | 4.90E-01 | |
| | PB-212 | 0.999 | 1.04E+00 | 1.26E-01 | |
| | BI-214 | 0.994 | 9.51E-01 | 1.31E-01 | |
| | PB-214 | 0.999 | 9.68E-01 | 1.22E-01 | |
| | RA-224 | 0.865 | 2.25E+00 | 8.62E-01 | |
| | RA-226 | 0.990 | 1.98E+00 | 3.77E+00 | |
| | AC-228 | 0.970 | 1.07E+00 | 2.16E-01 | |
| | PA-234M | 0.990 | 5.99E+00 | 4.75E+00 | |
| | TH-234 | 0.945 | 1.06E+00 | 1.31E+00 | |
| | CM-243 | 0.357 | 4.23E-01 | 2.54E-01 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 1:09:02PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 2 | 76.16 | 3.12446E-01 | 6.22 | | |
| | 4 | 93.06 | 2.19137E-02 | 56.68 | Tol. | GA-67 |
| | 5 | 153.75 | 1.73689E-02 | 56.69 | Tol. | CS-136 |
| M | 10 | 270.20 | 2.39542E-02 | 30.32 | | |
| | 14 | 327.94 | 1.74472E-02 | 40.87 | | |
| | 17 | 463.45 | 1.71473E-02 | 32.56 | Sum | |
| | 18 | 511.17 | 3.29746E-02 | 22.47 | | |
| | 22 | 768.36 | 6.55423E-03 | 45.05 | Sum | |
| | 23 | 795.43 | 1.47308E-02 | 34.47 | Sum | |
| | 24 | 893.52 | 6.11111E-03 | 58.96 | | |
| | 26 | 934.26 | 8.05556E-03 | 45.65 | | |
| | 29 | 1007.29 | 3.51587E-03 | 61.99 | | |
| | 31 | 1130.56 | 6.48860E-03 | 62.84 | Tol. | I-135 |
| | 32 | 1238.20 | 1.23611E-02 | 34.42 | | |
| | 33 | 1258.98 | 5.01263E-03 | 52.55 | | |
| | 34 | 1267.59 | 3.63889E-03 | 59.44 | | |
| | 35 | 1290.35 | 4.45157E-03 | 55.40 | | |
| | 36 | 1347.75 | 2.93478E-03 | 63.10 | | |
| | 37 | 1376.81 | 6.25000E-03 | 36.21 | | |
| | 39 | 1509.90 | 3.65556E-03 | 53.90 | | |
| | 40 | 1541.02 | 5.69444E-03 | 26.38 | | |
| M | 41 | 1560.35 | 1.79745E-03 | 44.05 | | |
| m | 42 | 1563.13 | 2.22082E-03 | 55.23 | | |
| M | 43 | 1581.19 | 3.48058E-03 | 61.43 | | |
| m | 44 | 1589.28 | 4.75650E-03 | 50.32 | | |
| m | 45 | 1593.13 | 5.09013E-03 | 35.05 | D-Esc | |
| | 47 | 1625.63 | 3.00347E-03 | 46.24 | | |
| | 48 | 1707.98 | 2.40278E-03 | 40.46 | Sum | |
| | 49 | 1720.11 | 2.22222E-03 | 46.77 | | |
| | 50 | 1731.20 | 3.78307E-03 | 46.29 | | |
| | 52 | 1790.51 | 5.00000E-03 | 23.57 | | |
| | 53 | 1812.29 | 2.26496E-03 | 57.77 | | |
| | 54 | 1821.62 | 1.72840E-03 | 62.50 | | |
| | 55 | 1888.51 | 1.66667E-03 | 61.24 | | |
| | 56 | 1962.07 | 1.66667E-03 | 70.71 | | |

Analysis Report for 1707087-17

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| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 57 | 2103.17 | 5.33730E-03 | 26.02 | S-Esc | |
| 58 | 2118.91 | 3.61111E-03 | 51.31 | | |
| 59 | 2170.53 | 2.22222E-03 | 43.75 | | |
| 61 | 2286.43 | 2.74573E-03 | 45.88 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | | 10.42 | 3.01E-02 | 1.57E+00 | 1.57E+00 |
| + | NA-22 | 1274.54 | | 99.94 | -9.56E-03 | 7.46E-02 | 7.46E-02 |
| + | @ NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | AL-26 | 1808.65 | | 99.76 | 3.41E-03 | 6.19E-02 | 6.19E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 2.16E+01 | 6.25E-01 | 6.25E-01 |
| + | @ AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | TI-44 | 67.88 | | 94.40 | -2.34E-03 | 4.20E-02 | 4.20E-02 |
| | | 78.34 | | 96.00 | 7.93E-02 | | 5.12E-02 |
| + | SC-46 | 889.25 | | 99.98 | 7.89E-03 | 1.35E-01 | 1.35E-01 |
| | | 1120.51 | | 99.99 | 4.31E-01 | | 2.67E-01 |
| + | V-48 | 983.52 | | 99.98 | -1.24E+00 | 4.95E+00 | 4.95E+00 |
| | | 1312.10 | | 97.50 | 1.90E+00 | | 5.96E+00 |
| + | CR-51 | 320.08 | | 9.83 | 1.12E+00 | 5.22E+00 | 5.22E+00 |
| + | MN-54 | 834.83 | | 99.97 | -3.26E-02 | 7.71E-02 | 7.71E-02 |
| + | CO-56 | 846.75 | | 99.96 | -2.80E-02 | 1.50E-01 | 1.50E-01 |
| | | 1037.75 | | 14.03 | 5.18E-02 | | 1.22E+00 |
| | | 1238.25 | | 67.00 | 3.70E-01 | | 3.83E-01 |
| | | 1771.40 | | 15.51 | -4.11E-01 | | 7.92E-01 |
| | | 2598.48 | | 16.90 | 4.87E-02 | | 3.59E-01 |
| + | CO-57 | 122.06 | | 85.51 | 6.22E-03 | 4.87E-02 | 4.87E-02 |
| | | 136.48 | | 10.60 | -2.37E-01 | | 4.88E-01 |
| + | CO-58 | 810.76 | | 99.40 | 9.28E-03 | 1.64E-01 | 1.64E-01 |
| + | FE-59 | 1099.22 | | 56.50 | 4.22E-01 | 6.30E-01 | 6.30E-01 |
| | | 1291.56 | | 43.20 | -3.62E-02 | | 8.70E-01 |

Analysis Report for 1707087-17

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| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | CO-60 | 1173.22 | 100.00 | 8.49E-03 | 7.73E-02 | 8.53E-02 |
| | | 1332.49 | 100.00 | 1.04E-02 | | 7.73E-02 |
| + | ZN-65 | 1115.52 | 50.75 | -1.32E-02 | 1.92E-01 | 1.92E-01 |
| + | GA-67 | 93.31 | 35.70 | 3.15E+08 | 1.74E+08 | 1.74E+08 |
| | | 208.95 | 2.24 | 4.34E+09 | | 3.24E+09 |
| | | 300.22 | 16.00 | 3.64E+08 | | 4.61E+08 |
| + | SE-75 | 121.11 | 16.70 | -1.88E-02 | 1.22E-01 | 3.42E-01 |
| | | 136.00 | 59.20 | 3.01E-02 | | 1.22E-01 |
| | | 264.65 | 59.80 | 4.64E-02 | | 1.23E-01 |
| | | 279.53 | 25.20 | 4.77E-02 | | 3.19E-01 |
| | | 400.65 | 11.40 | -3.34E-01 | | 6.79E-01 |
| + | RB-82 | 776.52 | 13.00 | -3.36E+00 | 6.74E+00 | 6.74E+00 |
| + | RB-83 | 520.41 | 46.00 | -2.27E-02 | 2.24E-01 | 2.24E-01 |
| | | 529.64 | 30.30 | 8.93E-03 | | 3.33E-01 |
| | | 552.65 | 16.40 | -5.12E-01 | | 5.44E-01 |
| + | KR-85 | 513.99 | 0.43 | -1.05E+01 | 1.37E+01 | 1.37E+01 |
| + | SR-85 | 513.99 | 99.27 | -1.30E-01 | 1.71E-01 | 1.71E-01 |
| + | Y-88 | 898.02 | 93.40 | 7.65E-04 | 8.66E-02 | 1.27E-01 |
| | | 1836.01 | 99.38 | 5.77E-03 | | 8.66E-02 |
| + | MO-93 | 263.06 | 56.72 | -7.77E-02 | 4.45E-02 | 7.19E-02 |
| | | 684.67 | 99.68 | 2.23E-03 | | 6.04E-02 |
| | | 1477.11 | 99.08 | -2.63E-02 | | 4.45E-02 |
| + | NB-93M | 16.57 | 9.43 | 0.00E+00 | 6.43E+00 | 6.43E+00 |
| + | NB-94 | 702.63 | 100.00 | -2.64E-02 | 5.67E-02 | 5.84E-02 |
| | | 871.10 | 100.00 | -3.26E-02 | | 5.67E-02 |
| + | NB-95 | 765.79 | 99.81 | 8.24E-02 | 5.05E-01 | 5.05E-01 |
| + | NB-95M | 235.69 | 25.00 | -3.75E+08 | 4.89E+07 | 4.89E+07 |
| + | ZR-95 | 724.18 | 43.70 | 1.60E-01 | 3.26E-01 | 4.73E-01 |
| | | 756.72 | 55.30 | 8.79E-02 | | 3.26E-01 |
| + | MO-99 | 181.06 | 6.20 | 6.61E+09 | 3.29E+10 | 5.11E+10 |
| | | 739.58 | 12.80 | 7.82E+08 | | 3.29E+10 |
| | | 778.00 | 4.50 | -2.30E+10 | | 9.74E+10 |
| + | RU-103 | 497.08 | 89.00 | -1.20E-02 | 2.83E-01 | 2.83E-01 |
| + | RU-106 | 621.84 | 9.80 | 1.54E-01 | 7.41E-01 | 7.41E-01 |
| + | AG-108M | 433.93 | 89.90 | 1.94E-02 | 4.94E-02 | 4.94E-02 |
| | | 614.37 | 90.40 | -1.35E-02 | | 6.98E-02 |
| | | 722.95 | 90.50 | -8.19E-02 | | 7.02E-02 |
| + | CD-109 | 88.03 | * 3.72 | 2.29E+00 | 1.90E+00 | 1.90E+00 |
| + | AG-110M | 657.75 | 93.14 | -4.81E-02 | 8.76E-02 | 8.76E-02 |
| | | 677.61 | 10.53 | -3.17E-01 | | 7.48E-01 |
| | | 706.67 | 16.46 | -2.05E-01 | | 4.66E-01 |
| | | 763.93 | 21.98 | 3.23E-02 | | 3.77E-01 |
| | | 884.67 | 71.63 | 4.40E-02 | | 1.15E-01 |
| | | 1384.27 | 23.94 | 9.46E-02 | | 2.98E-01 |
| + | CD-113M | 263.70 | 0.02 | 6.09E+01 | 1.85E+02 | 1.85E+02 |
| + | SN-113 | 255.12 | 1.93 | 3.44E+00 | 1.23E-01 | 4.34E+00 |
| | | 391.69 | 64.90 | 3.97E-02 | | 1.23E-01 |
| + | TE123M | 159.00 | 84.10 | -1.12E-03 | 9.20E-02 | 9.20E-02 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | SB-124 | 602.71 | | 97.87 | 4.58E-02 | 1.77E-01 | 1.77E-01 |
| | | 645.85 | | 7.26 | 9.25E-01 | | 2.46E+00 |
| | | 722.78 | | 11.10 | -1.41E-01 | | 1.71E+00 |
| | | 1691.02 | | 49.00 | 2.60E-02 | | 3.32E-01 |
| + | I-125 | 35.49 | | 6.49 | -3.33E+01 | 5.76E+00 | 5.76E+00 |
| + | SB-125 | 176.33 | | 6.89 | 1.61E-01 | 1.53E-01 | 6.71E-01 |
| | | 427.89 | | 29.33 | -7.19E-02 | | 1.53E-01 |
| | | 463.38 | | 10.35 | 6.63E-01 | | 6.00E-01 |
| | | 600.56 | | 17.80 | -2.75E-02 | | 3.25E-01 |
| | | 635.90 | | 11.32 | 3.11E-01 | | 6.18E-01 |
| + | SB-126 | 414.70 | | 83.30 | 1.03E+01 | 1.52E+01 | 1.52E+01 |
| | | 666.33 | | 99.60 | -1.98E+00 | | 1.61E+01 |
| | | 695.00 | | 99.60 | 1.34E+01 | | 1.79E+01 |
| | | 720.50 | | 53.80 | 3.94E+00 | | 2.85E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 1.98E-01 | 1.65E-01 | 1.65E-01 |
| + | SB-127 | 473.00 | | 25.00 | -4.86E+06 | 9.16E+06 | 1.02E+07 |
| | | 685.20 | | 35.70 | -1.59E+06 | | 9.16E+06 |
| | | 783.80 | | 14.70 | 1.44E+07 | | 2.75E+07 |
| + | I-129 | 29.78 | | 57.00 | 7.41E-02 | 3.65E-01 | 3.65E-01 |
| | | 33.60 | | 13.20 | 8.35E+00 | | 1.90E+00 |
| | | 39.58 | | 7.52 | 8.73E-01 | | 1.12E+00 |
| + | I-131 | 284.30 | | 6.05 | 1.57E+03 | 2.93E+02 | 3.53E+03 |
| | | 364.48 | | 81.20 | 2.19E+02 | | 2.93E+02 |
| | | 636.97 | | 7.26 | 3.14E+03 | | 4.75E+03 |
| | | 722.89 | | 1.80 | -2.15E+04 | | 1.84E+04 |
| + | TE-132 | 49.72 | | 13.10 | -1.04E+08 | 7.57E+07 | 5.20E+08 |
| | | 228.16 | | 88.00 | -5.79E+05 | | 7.57E+07 |
| + | BA-133 | 81.00 | | 33.00 | -2.79E-03 | 7.35E-02 | 1.03E-01 |
| | | 302.84 | | 17.80 | -1.83E-01 | | 2.52E-01 |
| | | 356.01 | | 60.00 | 7.66E-03 | | 7.35E-02 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -1.20E+03 | 4.39E+04 | 4.39E+04 |
| + | CS-134 | 563.23 | | 8.38 | -1.46E-01 | 6.54E-02 | 6.54E-01 |
| | | 569.32 | | 15.43 | -7.15E-02 | | 3.65E-01 |
| | | 604.70 | | 97.60 | 8.06E-04 | | 6.54E-02 |
| | | 795.84 | | 85.40 | 8.62E-02 | | 9.87E-02 |
| | | 801.93 | | 8.73 | 9.95E-02 | | 8.22E-01 |
| + | CS-135 | 268.24 | | 16.00 | -3.20E-02 | 3.18E-01 | 3.18E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | 6.89E+01 | 1.10E+01 | 1.12E+02 |
| | | 163.89 | | 4.61 | 8.99E+01 | | 1.79E+02 |
| | | 176.55 | | 13.56 | 1.43E+01 | | 5.95E+01 |
| | | 273.65 | | 12.66 | -1.09E+02 | | 6.90E+01 |
| | | 340.57 | | 48.50 | 6.19E-02 | | 2.13E+01 |
| | | 818.50 | | 99.70 | -4.07E+00 | | 1.10E+01 |
| | | 1048.07 | | 79.60 | -1.40E+00 | | 1.60E+01 |
| | | 1235.34 | | 19.70 | 4.71E+01 | | 9.63E+01 |

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| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| + | CS-137 | 661.65 | 85.12 | -1.83E-02 | 7.23E-02 | 7.23E-02 |
| + | LA-138 | 788.74 | 34.00 | 4.74E-02 | 1.07E-01 | 1.85E-01 |
| | | 1435.80 | 66.00 | 7.78E-03 | | 1.07E-01 |
| + | CE-139 | 165.85 | 80.35 | -3.67E-03 | 8.80E-02 | 8.80E-02 |
| + | BA-140 | 162.64 | 6.70 | -2.42E+01 | 3.90E+01 | 1.42E+02 |
| | | 304.84 | 4.50 | -6.50E+00 | | 2.06E+02 |
| | | 423.70 | 3.20 | 3.62E+01 | | 3.15E+02 |
| | | 437.55 | 2.00 | -3.49E+02 | | 4.47E+02 |
| | | 537.32 | 25.00 | -1.25E+01 | | 3.90E+01 |
| + | LA-140 | 328.77 | 20.50 | 3.60E+01 | 1.50E+01 | 5.61E+01 |
| | | 487.03 | 45.50 | -1.04E+01 | | 2.03E+01 |
| | | 815.85 | 23.50 | 4.87E+00 | | 5.42E+01 |
| | | 1596.49 | 95.49 | 1.60E+00 | | 1.50E+01 |
| + | CE-141 | 145.44 | 48.40 | -8.04E-02 | 7.23E-01 | 7.23E-01 |
| + | @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | CE-144 | 133.54 | 10.80 | -1.40E-01 | 3.71E-01 | 3.71E-01 |
| + | PM-144 | 476.78 | 42.00 | 2.48E-03 | 7.42E-02 | 1.30E-01 |
| | | 618.01 | 98.60 | -6.22E-03 | | 7.42E-02 |
| | | 696.49 | 99.49 | 5.15E-02 | | 8.38E-02 |
| + | PM-145 | 36.85 | 21.70 | -3.34E-01 | 2.45E-01 | 4.59E-01 |
| | | 37.36 | 39.70 | -8.67E-03 | | 2.45E-01 |
| | | 42.30 | 15.10 | 7.53E-02 | | 4.11E-01 |
| | | 72.40 | 2.31 | -6.03E+00 | | 1.95E+00 |
| + | PM-146 | 453.90 | 39.94 | 3.34E-02 | 1.27E-01 | 1.27E-01 |
| | | 735.90 | 14.01 | -1.57E-01 | | 4.29E-01 |
| | | 747.13 | 13.10 | 1.29E-01 | | 4.75E-01 |
| + | ND-147 | 91.11 | 28.90 | -1.02E+02 | 7.62E+01 | 7.62E+01 |
| | | 531.02 | 13.10 | 1.33E+01 | | 1.82E+02 |
| + | PM-149 | 285.90 | 3.10 | 3.23E+13 | 4.61E+13 | 4.61E+13 |
| + | EU-152 | 121.78 | 20.50 | 2.04E-02 | 1.59E-01 | 1.59E-01 |
| | | 244.69 | 5.40 | -1.52E+00 | | 8.55E-01 |
| | | 344.27 | 19.13 | -3.08E-02 | | 2.24E-01 |
| | | 778.89 | 9.20 | -1.56E-01 | | 6.60E-01 |
| | | 964.01 | 10.40 | 3.21E-01 | | 8.20E-01 |
| | | 1085.78 | 7.22 | 7.38E-01 | | 1.06E+00 |
| | | 1112.02 | 9.60 | 2.70E-01 | | 8.46E-01 |
| | | 1407.95 | 14.94 | 1.71E-01 | | 4.80E-01 |
| + | GD-153 | 97.43 | 31.30 | -1.03E-01 | 1.30E-01 | 1.30E-01 |
| | | 103.18 | 22.20 | -6.90E-02 | | 1.85E-01 |
| + | EU-154 | 123.07 | 40.50 | 3.20E-03 | 7.98E-02 | 7.98E-02 |
| | | 723.30 | 19.70 | -3.84E-01 | | 3.29E-01 |
| | | 873.19 | 11.50 | 1.78E-02 | | 5.51E-01 |
| | | 996.32 | 10.30 | -2.36E-03 | | 6.34E-01 |
| | | 1004.76 | 17.90 | -1.30E-02 | | 3.83E-01 |
| | | 1274.45 | 35.50 | -2.56E-02 | | 2.00E-01 |
| + | EU-155 | 86.50 | 30.90 | 1.81E-01 | 1.49E-01 | 1.49E-01 |
| | | 105.30 | 20.70 | 1.42E-01 | | 1.70E-01 |

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| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | EU-156 | 811.77 | | 10.40 | -1.33E+01 | 5.35E+01 | 5.35E+01 |
| | | 1153.47 | | 7.20 | 6.12E+01 | | 1.07E+02 |
| | | 1230.71 | | 8.90 | 3.50E+01 | | 8.99E+01 |
| + | HO-166M | 184.41 | | 72.60 | 1.15E-01 | 7.36E-02 | 7.36E-02 |
| | | 280.45 | | 29.60 | -1.49E-01 | | 1.37E-01 |
| | | 410.94 | | 11.10 | 1.50E-01 | | 4.55E-01 |
| | | 711.69 | | 54.10 | 3.59E-02 | | 1.16E-01 |
| + | TM-171 | 66.72 | | 0.14 | -1.04E+01 | 3.16E+01 | 3.16E+01 |
| + | HF-172 | 67.35 | | 5.31 | -4.61E-02 | 2.84E-01 | 8.28E-01 |
| | | 125.81 | | 11.30 | -1.25E-01 | | 2.84E-01 |
| + | LU-172 | 181.53 | | 20.60 | 1.34E+03 | 3.38E+03 | 6.16E+03 |
| | | 900.72 | | 29.81 | 1.67E+03 | | 6.27E+03 |
| | | 1093.66 | | 62.50 | -4.12E+02 | | 3.38E+03 |
| + | LU-173 | 100.72 | | 5.24 | 3.09E-02 | 2.90E-01 | 7.04E-01 |
| | | 272.11 | | 21.20 | 2.55E-01 | | 2.90E-01 |
| + | HF-175 | 343.40 | | 84.00 | -1.05E-02 | 1.36E-01 | 1.36E-01 |
| + | LU-176 | 88.34 | | 13.30 | 1.32E-01 | 4.65E-02 | 3.37E-01 |
| | | 201.83 | | 86.00 | -2.84E-02 | | 5.09E-02 |
| | | 306.78 | | 94.00 | 1.81E-02 | | 4.65E-02 |
| + | HF-181 | 133.02 | | 41.70 | 1.04E-01 | 2.84E-01 | 3.87E-01 |
| | | 345.85 | | 17.20 | 5.55E-02 | | 1.23E+00 |
| | | 482.03 | | 82.80 | 9.14E-02 | | 2.84E-01 |
| + | TA-182 | 67.75 | | 41.20 | -9.76E-03 | 1.75E-01 | 1.75E-01 |
| | | 1121.30 | | 34.90 | 1.12E+00 | | 6.25E-01 |
| | | 1189.05 | | 16.23 | 2.27E-02 | | 9.66E-01 |
| | | 1221.41 | | 26.98 | 2.15E-01 | | 6.28E-01 |
| | | 1231.02 | | 11.44 | 5.35E-01 | | 1.38E+00 |
| + | IR-192 | 308.46 | | 29.68 | -2.06E-02 | 2.47E-01 | 3.63E-01 |
| | | 468.07 | | 48.10 | 6.01E-02 | | 2.47E-01 |
| + | HG-203 | 279.19 | | 77.30 | 1.94E-01 | 2.78E-01 | 2.78E-01 |
| + | TL-204 | 374.74 | | 94.11 | 0.00E+00 | 5.07E-02 | 5.07E-02 |
| | | 899.15 | | 99.16 | 2.13E-03 | | 6.49E-02 |
| | | 911.74 | | 91.10 | 3.54E-01 | | 1.48E-01 |
| + | BI-207 | 569.67 | | 97.72 | -1.04E-02 | 5.30E-02 | 5.30E-02 |
| | | 1063.62 | | 74.90 | 1.35E-03 | | 9.87E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 1.20E+00 | 9.90E-02 | 2.81E-01 |
| | | 860.37 | | 4.48 | 4.34E-01 | | 1.68E+00 |
| | | 2614.66 | * | 35.85 | 8.95E-01 | | 9.90E-02 |
| + | BI-210M | 262.00 | | 45.00 | -8.40E-02 | 8.77E-02 | 8.77E-02 |
| | | 300.00 | | 23.00 | 1.73E-01 | | 2.19E-01 |
| + | PB-210 | 46.50 | | 4.25 | 1.87E+00 | 1.39E+00 | 1.39E+00 |
| + | PB-211 | 404.84 | | 2.90 | 4.24E-01 | 1.62E+00 | 1.62E+00 |
| | | 831.96 | | 2.90 | -2.91E-01 | | 2.14E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 7.41E-01 | 8.84E-01 | 8.84E-01 |
| | | 1620.62 | * | 2.75 | 9.59E-01 | | 1.64E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.03E+00 | 2.09E-01 | 2.09E-01 |
| | | 300.09 | * | 3.41 | 1.46E+00 | | 2.67E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 8.58E-01 | 1.57E-01 | 1.57E-01 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | BI-214 | 1120.29 | * | 15.10 | 1.31E+00 | 1.57E-01 | 5.97E-01 |
| | | 1764.49 | * | 15.80 | 1.23E+00 | | 2.56E-01 |
| | | 2204.22 | * | 4.98 | 8.30E-01 | | 9.14E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 1.11E+00 | 1.73E-01 | 4.67E-01 |
| | | 351.92 | * | 37.19 | 8.89E-01 | | 1.73E-01 |
| + | RN-219 | 401.80 | | 6.50 | -4.99E-02 | 6.93E-01 | 6.93E-01 |
| + | RA-223 | 323.87 | | 3.88 | 3.35E-01 | 1.14E+00 | 1.14E+00 |
| + | RA-224 | 240.98 | * | 3.95 | 2.25E+00 | 2.35E+00 | 2.35E+00 |
| + | RA-225 | 40.00 | | 31.00 | 2.15E+01 | 2.76E+01 | 2.76E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.98E+00 | 1.63E+00 | 1.63E+00 |
| + | TH-227 | 50.10 | | 8.40 | -1.07E-01 | 5.39E-01 | 5.39E-01 |
| | | 236.00 | | 11.50 | -4.29E+00 | | 5.59E-01 |
| | | 256.20 | | 6.30 | -9.03E-02 | | 7.04E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.26E+00 | 3.61E-01 | 7.72E-01 |
| | | 911.07 | * | 27.70 | 1.08E+00 | | 3.61E-01 |
| | | 969.11 | * | 16.60 | 8.82E-01 | | 6.98E-01 |
| + | TH-230 | 48.44 | | 16.90 | -2.92E-01 | 2.81E-01 | 2.81E-01 |
| | | 62.85 | | 4.60 | 3.88E-01 | | 1.01E+00 |
| | | 67.67 | | 0.37 | -5.96E-01 | | 1.07E+01 |
| + | PA-231 | 283.67 | | 1.60 | 1.13E+00 | 1.91E+00 | 2.55E+00 |
| | | 302.67 | | 2.30 | -1.39E+00 | | 1.91E+00 |
| + | TH-231 | 25.64 | | 14.70 | 0.00E+00 | 1.14E-01 | 1.14E-01 |
| | | 84.21 | | 6.40 | 3.90E-01 | | 6.00E-01 |
| + | PA-233 | 311.98 | | 38.60 | -6.18E-01 | 1.35E+00 | 1.35E+00 |
| + | PA-234 | 131.20 | | 20.40 | -6.59E-02 | 1.58E-01 | 1.58E-01 |
| | | 733.99 | | 8.80 | -1.19E-01 | | 6.58E-01 |
| | | 946.00 | | 12.00 | -7.45E-02 | | 5.66E-01 |
| + | PA-234M | 1001.03 | * | 0.92 | 5.99E+00 | 7.41E+00 | 7.41E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 1.06E+00 | 2.15E+00 | 2.15E+00 |
| + | U-235 | 143.76 | | 10.50 | -1.86E-01 | 3.99E-01 | 3.99E-01 |
| | | 163.35 | | 4.70 | 4.71E-01 | | 9.40E-01 |
| | | 205.31 | | 4.70 | 4.16E-01 | | 9.28E-01 |
| + | NP-237 | 86.50 | | 12.60 | 4.27E-01 | 3.53E-01 | 3.53E-01 |
| + | NP-239 | 106.10 | | 22.70 | 6.12E+11 | 7.34E+11 | 7.34E+11 |
| | | 228.18 | | 10.70 | -1.57E+10 | | 2.05E+12 |
| | | 277.60 | | 14.10 | 1.19E+12 | | 1.71E+12 |
| + | AM-241 | 59.54 | | 35.90 | 6.39E-02 | 1.21E-01 | 1.21E-01 |
| + | AM-243 | 74.67 | | 66.00 | -1.81E-01 | 8.22E-02 | 8.22E-02 |
| + | CM-243 | 209.75 | * | 3.29 | 1.21E+00 | 4.25E-01 | 1.81E+00 |
| | | 228.14 | | 10.60 | -3.25E-03 | | 4.25E-01 |
| | | 277.60 | * | 14.00 | 3.80E-01 | | 8.25E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.57E+00 | 1.57E+00 | 3.01E-02 | 7.36E-01 |
| | NA-22 | 1274.54 | | 99.94 | 7.46E-02 | 7.46E-02 | -9.56E-03 | 3.39E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 6.19E-02 | 6.19E-02 | 3.41E-03 | 2.69E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 6.25E-01 | 6.25E-01 | 2.16E+01 | 2.80E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 4.20E-02 | 4.20E-02 | -2.34E-03 | 2.04E-02 |
| | | 78.34 | | 96.00 | 5.12E-02 | | 7.93E-02 | 2.50E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.35E-01 | 1.35E-01 | 7.89E-03 | 6.22E-02 |
| | | 1120.51 | | 99.99 | 2.67E-01 | | 4.31E-01 | 1.27E-01 |
| | V-48 | 983.52 | | 99.98 | 4.95E+00 | 4.95E+00 | -1.24E+00 | 2.28E+00 |
| | | 1312.10 | | 97.50 | 5.96E+00 | | 1.90E+00 | 2.73E+00 |
| | CR-51 | 320.08 | | 9.83 | 5.22E+00 | 5.22E+00 | 1.12E+00 | 2.48E+00 |
| | MN-54 | 834.83 | | 99.97 | 7.71E-02 | 7.71E-02 | -3.26E-02 | 3.58E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.50E-01 | 1.50E-01 | -2.80E-02 | 6.96E-02 |
| | | 1037.75 | | 14.03 | 1.22E+00 | | 5.18E-02 | 5.64E-01 |
| | | 1238.25 | | 67.00 | 3.83E-01 | | 3.70E-01 | 1.80E-01 |
| | | 1771.40 | | 15.51 | 7.92E-01 | | -4.11E-01 | 3.34E-01 |
| | | 2598.48 | | 16.90 | 3.59E-01 | | 4.87E-02 | 1.13E-01 |
| | CO-57 | 122.06 | | 85.51 | 4.87E-02 | 4.87E-02 | 6.22E-03 | 2.34E-02 |
| | | 136.48 | | 10.60 | 4.88E-01 | | -2.37E-01 | 2.37E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.64E-01 | 1.64E-01 | 9.28E-03 | 7.64E-02 |
| | FE-59 | 1099.22 | | 56.50 | 6.30E-01 | 6.30E-01 | 4.22E-01 | 2.92E-01 |
| | | 1291.56 | | 43.20 | 8.70E-01 | | -3.62E-02 | 4.01E-01 |
| | CO-60 | 1173.22 | | 100.00 | 8.53E-02 | 7.73E-02 | 8.49E-03 | 3.96E-02 |
| | | 1332.49 | | 100.00 | 7.73E-02 | | 1.04E-02 | 3.53E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 1.92E-01 | 1.92E-01 | -1.32E-02 | 8.88E-02 |
| | GA-67 | 93.31 | | 35.70 | 1.74E+08 | 1.74E+08 | 3.15E+08 | 8.47E+07 |
| | | 208.95 | | 2.24 | 3.24E+09 | | 4.34E+09 | 1.57E+09 |
| | | 300.22 | | 16.00 | 4.61E+08 | | 3.64E+08 | 2.21E+08 |
| | SE-75 | 121.11 | | 16.70 | 3.42E-01 | 1.22E-01 | -1.88E-02 | 1.65E-01 |
| | | 136.00 | | 59.20 | 1.22E-01 | | 3.01E-02 | 5.93E-02 |
| | | 264.65 | | 59.80 | 1.23E-01 | | 4.64E-02 | 5.90E-02 |
| | | 279.53 | | 25.20 | 3.19E-01 | | 4.77E-02 | 1.53E-01 |
| | | 400.65 | | 11.40 | 6.79E-01 | | -3.34E-01 | 3.20E-01 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | RB-82 | 776.52 | | 13.00 | 6.74E+00 | 6.74E+00 | -3.36E+00 | 3.13E+00 |
| | RB-83 | 520.41 | | 46.00 | 2.24E-01 | 2.24E-01 | -2.27E-02 | 1.05E-01 |
| | | 529.64 | | 30.30 | 3.33E-01 | | 8.93E-03 | 1.55E-01 |
| | | 552.65 | | 16.40 | 5.44E-01 | | -5.12E-01 | 2.50E-01 |
| | KR-85 | 513.99 | | 0.43 | 1.37E+01 | 1.37E+01 | -1.05E+01 | 6.52E+00 |
| | SR-85 | 513.99 | | 99.27 | 1.71E-01 | 1.71E-01 | -1.30E-01 | 8.09E-02 |
| | Y-88 | 898.02 | | 93.40 | 1.27E-01 | 8.66E-02 | 7.65E-04 | 5.88E-02 |
| | | 1836.01 | | 99.38 | 8.66E-02 | | 5.77E-03 | 3.55E-02 |
| | MO-93 | 263.06 | | 56.72 | 7.19E-02 | 4.45E-02 | -7.77E-02 | 3.43E-02 |
| | | 684.67 | | 99.68 | 6.04E-02 | | 2.23E-03 | 2.83E-02 |
| | | 1477.11 | | 99.08 | 4.45E-02 | | -2.63E-02 | 1.86E-02 |
| | NB-93M | 16.57 | | 9.43 | 6.43E+00 | 6.43E+00 | 0.00E+00 | 0.00E+00 |
| | NB-94 | 702.63 | | 100.00 | 5.84E-02 | 5.67E-02 | -2.64E-02 | 2.73E-02 |
| | | 871.10 | | 100.00 | 5.67E-02 | | -3.26E-02 | 2.60E-02 |
| | NB-95 | 765.79 | | 99.81 | 5.05E-01 | 5.05E-01 | 8.24E-02 | 2.38E-01 |
| | NB-95M | 235.69 | | 25.00 | 4.89E+07 | 4.89E+07 | -3.75E+08 | 2.38E+07 |
| | ZR-95 | 724.18 | | 43.70 | 4.73E-01 | 3.26E-01 | 1.60E-01 | 2.23E-01 |
| | | 756.72 | | 55.30 | 3.26E-01 | | 8.79E-02 | 1.52E-01 |
| | MO-99 | 181.06 | | 6.20 | 5.11E+10 | 3.29E+10 | 6.61E+09 | 2.47E+10 |
| | | 739.58 | | 12.80 | 3.29E+10 | | 7.82E+08 | 1.53E+10 |
| | | 778.00 | | 4.50 | 9.74E+10 | | -2.30E+10 | 4.53E+10 |
| | RU-103 | 497.08 | | 89.00 | 2.83E-01 | 2.83E-01 | -1.20E-02 | 1.32E-01 |
| | RU-106 | 621.84 | | 9.80 | 7.41E-01 | 7.41E-01 | 1.54E-01 | 3.49E-01 |
| | AG-108M | 433.93 | | 89.90 | 4.94E-02 | 4.94E-02 | 1.94E-02 | 2.32E-02 |
| | | 614.37 | | 90.40 | 6.98E-02 | | -1.35E-02 | 3.30E-02 |
| | | 722.95 | | 90.50 | 7.02E-02 | | -8.19E-02 | 3.29E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 1.90E+00 | 1.90E+00 | 2.29E+00 | 9.35E-01 |
| | AG-110M | 657.75 | | 93.14 | 8.76E-02 | 8.76E-02 | -4.81E-02 | 4.12E-02 |
| | | 677.61 | | 10.53 | 7.48E-01 | | -3.17E-01 | 3.51E-01 |
| | | 706.67 | | 16.46 | 4.66E-01 | | -2.05E-01 | 2.18E-01 |
| | | 763.93 | | 21.98 | 3.77E-01 | | 3.23E-02 | 1.76E-01 |
| | | 884.67 | | 71.63 | 1.15E-01 | | 4.40E-02 | 5.33E-02 |
| | | 1384.27 | | 23.94 | 2.98E-01 | | 9.46E-02 | 1.31E-01 |
| | CD-113M | 263.70 | | 0.02 | 1.85E+02 | 1.85E+02 | 6.09E+01 | 8.84E+01 |
| | SN-113 | 255.12 | | 1.93 | 4.34E+00 | 1.23E-01 | 3.44E+00 | 2.09E+00 |
| | | 391.69 | | 64.90 | 1.23E-01 | | 3.97E-02 | 5.78E-02 |
| | TE123M | 159.00 | | 84.10 | 9.20E-02 | 9.20E-02 | -1.12E-03 | 4.46E-02 |
| | SB-124 | 602.71 | | 97.87 | 1.77E-01 | 1.77E-01 | 4.58E-02 | 8.29E-02 |
| | | 645.85 | | 7.26 | 2.46E+00 | | 9.25E-01 | 1.15E+00 |
| | | 722.78 | | 11.10 | 1.71E+00 | | -1.41E-01 | 8.00E-01 |
| | | 1691.02 | | 49.00 | 3.32E-01 | | 2.60E-02 | 1.41E-01 |
| | I-125 | 35.49 | | 6.49 | 5.76E+00 | 5.76E+00 | -3.33E+01 | 2.79E+00 |
| | SB-125 | 176.33 | | 6.89 | 6.71E-01 | 1.53E-01 | 1.61E-01 | 3.25E-01 |
| | | 427.89 | | 29.33 | 1.53E-01 | | -7.19E-02 | 7.15E-02 |
| | | 463.38 | | 10.35 | 6.00E-01 | | 6.63E-01 | 2.86E-01 |
| | | 600.56 | | 17.80 | 3.25E-01 | | -2.75E-02 | 1.52E-01 |
| | | 635.90 | | 11.32 | 6.18E-01 | | 3.11E-01 | 2.92E-01 |
| | SB-126 | 414.70 | | 83.30 | 1.52E+01 | 1.52E+01 | 1.03E+01 | 7.22E+00 |
| | | 666.33 | | 99.60 | 1.61E+01 | | -1.98E+00 | 7.56E+00 |
| | | 695.00 | | 99.60 | 1.79E+01 | | 1.34E+01 | 8.44E+00 |
| | | 720.50 | | 53.80 | 2.85E+01 | | 3.94E+00 | 1.33E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 1.65E-01 | 1.65E-01 | 1.98E-01 | 8.10E-02 |
| | SB-127 | 473.00 | | 25.00 | 1.02E+07 | 9.16E+06 | -4.86E+06 | 4.77E+06 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| SB-127 | 685.20 | 35.70 | 9.16E+06 | 9.16E+06 | -1.59E+06 | 4.27E+06 |
| | 783.80 | 14.70 | 2.75E+07 | | 1.44E+07 | 1.29E+07 |
| I-129 | 29.78 | 57.00 | 3.65E-01 | 3.65E-01 | 7.41E-02 | 1.76E-01 |
| | 33.60 | 13.20 | 1.90E+00 | | 8.35E+00 | 9.32E-01 |
| | 39.58 | 7.52 | 1.12E+00 | | 8.73E-01 | 5.41E-01 |
| I-131 | 284.30 | 6.05 | 3.53E+03 | 2.93E+02 | 1.57E+03 | 1.68E+03 |
| | 364.48 | 81.20 | 2.93E+02 | | 2.19E+02 | 1.39E+02 |
| | 636.97 | 7.26 | 4.75E+03 | | 3.14E+03 | 2.25E+03 |
| | 722.89 | 1.80 | 1.84E+04 | | -2.15E+04 | 8.61E+03 |
| TE-132 | 49.72 | 13.10 | 5.20E+08 | 7.57E+07 | -1.04E+08 | 2.51E+08 |
| | 228.16 | 88.00 | 7.57E+07 | | -5.79E+05 | 3.64E+07 |
| BA-133 | 81.00 | 33.00 | 1.03E-01 | 7.35E-02 | -2.79E-03 | 4.96E-02 |
| | 302.84 | 17.80 | 2.52E-01 | | -1.83E-01 | 1.20E-01 |
| | 356.01 | 60.00 | 7.35E-02 | | 7.66E-03 | 3.48E-02 |
| @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| XE-133 | 81.00 | 38.00 | 4.39E+04 | 4.39E+04 | -1.20E+03 | 2.12E+04 |
| CS-134 | 563.23 | 8.38 | 6.54E-01 | 6.54E-02 | -1.46E-01 | 3.06E-01 |
| | 569.32 | 15.43 | 3.65E-01 | | -7.15E-02 | 1.71E-01 |
| | 604.70 | 97.60 | 6.54E-02 | | 8.06E-04 | 3.08E-02 |
| | 795.84 | 85.40 | 9.87E-02 | | 8.62E-02 | 4.66E-02 |
| | 801.93 | 8.73 | 8.22E-01 | | 9.95E-02 | 3.84E-01 |
| CS-135 | 268.24 | 16.00 | 3.18E-01 | 3.18E-01 | -3.20E-02 | 1.53E-01 |
| @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CS-136 | 153.22 | 7.46 | 1.12E+02 | 1.10E+01 | 6.89E+01 | 5.43E+01 |
| | 163.89 | 4.61 | 1.79E+02 | | 8.99E+01 | 8.69E+01 |
| | 176.55 | 13.56 | 5.95E+01 | | 1.43E+01 | 2.88E+01 |
| | 273.65 | 12.66 | 6.90E+01 | | -1.09E+02 | 3.31E+01 |
| | 340.57 | 48.50 | 2.13E+01 | | 6.19E-02 | 1.02E+01 |
| | 818.50 | 99.70 | 1.10E+01 | | -4.07E+00 | 5.09E+00 |
| | 1048.07 | 79.60 | 1.60E+01 | | -1.40E+00 | 7.35E+00 |
| | 1235.34 | 19.70 | 9.63E+01 | | 4.71E+01 | 4.53E+01 |
| CS-137 | 661.65 | 85.12 | 7.23E-02 | 7.23E-02 | -1.83E-02 | 3.40E-02 |
| LA-138 | 788.74 | 34.00 | 1.85E-01 | 1.07E-01 | 4.74E-02 | 8.61E-02 |
| | 1435.80 | 66.00 | 1.07E-01 | | 7.78E-03 | 4.83E-02 |
| CE-139 | 165.85 | 80.35 | 8.80E-02 | 8.80E-02 | -3.67E-03 | 4.26E-02 |
| BA-140 | 162.64 | 6.70 | 1.42E+02 | 3.90E+01 | -2.42E+01 | 6.87E+01 |
| | 304.84 | 4.50 | 2.06E+02 | | -6.50E+00 | 9.82E+01 |
| | 423.70 | 3.20 | 3.15E+02 | | 3.62E+01 | 1.49E+02 |
| | 437.55 | 2.00 | 4.47E+02 | | -3.49E+02 | 2.09E+02 |
| | 537.32 | 25.00 | 3.90E+01 | | -1.25E+01 | 1.81E+01 |
| LA-140 | 328.77 | 20.50 | 5.61E+01 | 1.50E+01 | 3.60E+01 | 2.69E+01 |
| | 487.03 | 45.50 | 2.03E+01 | | -1.04E+01 | 9.46E+00 |
| | 815.85 | 23.50 | 5.42E+01 | | 4.87E+00 | 2.51E+01 |
| | 1596.49 | 95.49 | 1.50E+01 | | 1.60E+00 | 6.66E+00 |
| CE-141 | 145.44 | 48.40 | 7.23E-01 | 7.23E-01 | -8.04E-02 | 3.51E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 3.71E-01 | 3.71E-01 | -1.40E-01 | 1.78E-01 |
| PM-144 | 476.78 | 42.00 | 1.30E-01 | 7.42E-02 | 2.48E-03 | 6.08E-02 |
| | 618.01 | 98.60 | 7.42E-02 | | -6.22E-03 | 3.50E-02 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| PM-144 | 696.49 | 99.49 | 8.38E-02 | 7.42E-02 | 5.15E-02 | 3.96E-02 |
| PM-145 | 36.85 | 21.70 | 4.59E-01 | 2.45E-01 | -3.34E-01 | 2.22E-01 |
| | 37.36 | 39.70 | 2.45E-01 | | -8.67E-03 | 1.19E-01 |
| | 42.30 | 15.10 | 4.11E-01 | | 7.53E-02 | 1.98E-01 |
| | 72.40 | 2.31 | 1.95E+00 | | -6.03E+00 | 9.50E-01 |
| PM-146 | 453.90 | 39.94 | 1.27E-01 | 1.27E-01 | 3.34E-02 | 6.01E-02 |
| | 735.90 | 14.01 | 4.29E-01 | | -1.57E-01 | 1.99E-01 |
| | 747.13 | 13.10 | 4.75E-01 | | 1.29E-01 | 2.21E-01 |
| ND-147 | 91.11 | 28.90 | 7.62E+01 | 7.62E+01 | -1.02E+02 | 3.71E+01 |
| | 531.02 | 13.10 | 1.82E+02 | | 1.33E+01 | 8.46E+01 |
| PM-149 | 285.90 | 3.10 | 4.61E+13 | 4.61E+13 | 3.23E+13 | 2.20E+13 |
| EU-152 | 121.78 | 20.50 | 1.59E-01 | 1.59E-01 | 2.04E-02 | 7.68E-02 |
| | 244.69 | 5.40 | 8.55E-01 | | -1.52E+00 | 4.11E-01 |
| | 344.27 | 19.13 | 2.24E-01 | | -3.08E-02 | 1.06E-01 |
| | 778.89 | 9.20 | 6.60E-01 | | -1.56E-01 | 3.07E-01 |
| | 964.01 | 10.40 | 8.20E-01 | | 3.21E-01 | 3.85E-01 |
| | 1085.78 | 7.22 | 1.06E+00 | | 7.38E-01 | 4.91E-01 |
| | 1112.02 | 9.60 | 8.46E-01 | | 2.70E-01 | 3.93E-01 |
| | 1407.95 | 14.94 | 4.80E-01 | | 1.71E-01 | 2.17E-01 |
| GD-153 | 97.43 | 31.30 | 1.30E-01 | 1.30E-01 | -1.03E-01 | 6.27E-02 |
| | 103.18 | 22.20 | 1.85E-01 | | -6.90E-02 | 8.93E-02 |
| EU-154 | 123.07 | 40.50 | 7.98E-02 | 7.98E-02 | 3.20E-03 | 3.84E-02 |
| | 723.30 | 19.70 | 3.29E-01 | | -3.84E-01 | 1.54E-01 |
| | 873.19 | 11.50 | 5.51E-01 | | 1.78E-02 | 2.55E-01 |
| | 996.32 | 10.30 | 6.34E-01 | | -2.36E-03 | 2.92E-01 |
| | 1004.76 | 17.90 | 3.83E-01 | | -1.30E-02 | 1.76E-01 |
| | 1274.45 | 35.50 | 2.00E-01 | | -2.56E-02 | 9.07E-02 |
| EU-155 | 86.50 | 30.90 | 1.49E-01 | 1.49E-01 | 1.81E-01 | 7.29E-02 |
| | 105.30 | 20.70 | 1.70E-01 | | 1.42E-01 | 8.22E-02 |
| EU-156 | 811.77 | 10.40 | 5.35E+01 | 5.35E+01 | -1.33E+01 | 2.48E+01 |
| | 1153.47 | 7.20 | 1.07E+02 | | 6.12E+01 | 4.99E+01 |
| | 1230.71 | 8.90 | 8.99E+01 | | 3.50E+01 | 4.18E+01 |
| HO-166M | 184.41 | 72.60 | 7.36E-02 | 7.36E-02 | 1.15E-01 | 3.58E-02 |
| | 280.45 | 29.60 | 1.37E-01 | | -1.49E-01 | 6.55E-02 |
| | 410.94 | 11.10 | 4.55E-01 | | 1.50E-01 | 2.16E-01 |
| | 711.69 | 54.10 | 1.16E-01 | | 3.59E-02 | 5.46E-02 |
| TM-171 | 66.72 | 0.14 | 3.16E+01 | 3.16E+01 | -1.04E+01 | 1.53E+01 |
| HF-172 | 67.35 | 5.31 | 8.28E-01 | 2.84E-01 | -4.61E-02 | 4.01E-01 |
| | 125.81 | 11.30 | 2.84E-01 | | -1.25E-01 | 1.36E-01 |
| LU-172 | 181.53 | 20.60 | 6.16E+03 | 3.38E+03 | 1.34E+03 | 2.98E+03 |
| | 900.72 | 29.81 | 6.27E+03 | | 1.67E+03 | 2.91E+03 |
| | 1093.66 | 62.50 | 3.38E+03 | | -4.12E+02 | 1.56E+03 |
| LU-173 | 100.72 | 5.24 | 7.04E-01 | 2.90E-01 | 3.09E-02 | 3.40E-01 |
| | 272.11 | 21.20 | 2.90E-01 | | 2.55E-01 | 1.40E-01 |
| HF-175 | 343.40 | 84.00 | 1.36E-01 | 1.36E-01 | -1.05E-02 | 6.44E-02 |
| LU-176 | 88.34 | 13.30 | 3.37E-01 | 4.65E-02 | 1.32E-01 | 1.65E-01 |
| | 201.83 | 86.00 | 5.09E-02 | | -2.84E-02 | 2.45E-02 |
| | 306.78 | 94.00 | 4.65E-02 | | 1.81E-02 | 2.21E-02 |
| HF-181 | 133.02 | 41.70 | 3.87E-01 | 2.84E-01 | 1.04E-01 | 1.86E-01 |
| | 345.85 | 17.20 | 1.23E+00 | | 5.55E-02 | 5.84E-01 |
| | 482.03 | 82.80 | 2.84E-01 | | 9.14E-02 | 1.33E-01 |
| TA-182 | 67.75 | 41.20 | 1.75E-01 | 1.75E-01 | -9.76E-03 | 8.51E-02 |
| | 1121.30 | 34.90 | 6.25E-01 | | 1.12E+00 | 2.98E-01 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TA-182 | 1189.05 | | 16.23 | 9.66E-01 | 1.75E-01 | 2.27E-02 | 4.49E-01 |
| | | 1221.41 | | 26.98 | 6.28E-01 | | 2.15E-01 | 2.94E-01 |
| | | 1231.02 | | 11.44 | 1.38E+00 | | 5.35E-01 | 6.39E-01 |
| | IR-192 | 308.46 | | 29.68 | 3.63E-01 | 2.47E-01 | -2.06E-02 | 1.72E-01 |
| | | 468.07 | | 48.10 | 2.47E-01 | | 6.01E-02 | 1.16E-01 |
| | HG-203 | 279.19 | | 77.30 | 2.78E-01 | 2.78E-01 | 1.94E-01 | 1.34E-01 |
| | TL-204 | 374.74 | | 94.11 | 5.07E-02 | 5.07E-02 | 0.00E+00 | 2.40E-02 |
| | | 899.15 | | 99.16 | 6.49E-02 | | 2.13E-03 | 2.99E-02 |
| | | 911.74 | | 91.10 | 1.48E-01 | | 3.54E-01 | 7.10E-02 |
| | BI-207 | 569.67 | | 97.72 | 5.30E-02 | 5.30E-02 | -1.04E-02 | 2.48E-02 |
| | | 1063.62 | | 74.90 | 9.87E-02 | | 1.35E-03 | 4.57E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 2.81E-01 | 9.90E-02 | 1.20E+00 | 1.35E-01 |
| | | 860.37 | | 4.48 | 1.68E+00 | | 4.34E-01 | 7.89E-01 |
| | | 2614.66 | * | 35.85 | 9.90E-02 | | 8.95E-01 | 3.65E-02 |
| | BI-210M | 262.00 | | 45.00 | 8.77E-02 | 8.77E-02 | -8.40E-02 | 4.18E-02 |
| | | 300.00 | | 23.00 | 2.19E-01 | | 1.73E-01 | 1.05E-01 |
| | PB-210 | 46.50 | | 4.25 | 1.39E+00 | 1.39E+00 | 1.87E+00 | 6.75E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.62E+00 | 1.62E+00 | 4.24E-01 | 7.67E-01 |
| | | 831.96 | | 2.90 | 2.14E+00 | | -2.91E-01 | 9.95E-01 |
| + | BI-212 | 727.17 | * | 11.80 | 8.84E-01 | 8.84E-01 | 7.41E-01 | 4.25E-01 |
| | | 1620.62 | * | 2.75 | 1.64E+00 | | 9.59E-01 | 6.82E-01 |
| + | PB-212 | 238.63 | * | 44.60 | 2.09E-01 | 2.09E-01 | 1.03E+00 | 1.02E-01 |
| | | 300.09 | * | 3.41 | 2.67E+00 | | 1.46E+00 | 1.30E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 1.57E-01 | 1.57E-01 | 8.58E-01 | 7.50E-02 |
| | | 1120.29 | * | 15.10 | 5.97E-01 | | 1.31E+00 | 2.80E-01 |
| | | 1764.49 | * | 15.80 | 2.56E-01 | | 1.23E+00 | 1.03E-01 |
| | | 2204.22 | * | 4.98 | 9.14E-01 | | 8.30E-01 | 3.68E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 4.67E-01 | 1.73E-01 | 1.11E+00 | 2.28E-01 |
| | | 351.92 | * | 37.19 | 1.73E-01 | | 8.89E-01 | 8.35E-02 |
| | RN-219 | 401.80 | | 6.50 | 6.93E-01 | 6.93E-01 | -4.99E-02 | 3.27E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.14E+00 | 1.14E+00 | 3.35E-01 | 5.41E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 2.35E+00 | 2.35E+00 | 2.25E+00 | 1.15E+00 |
| | RA-225 | 40.00 | | 31.00 | 2.76E+01 | 2.76E+01 | 2.15E+01 | 1.33E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.63E+00 | 1.63E+00 | 1.98E+00 | 7.91E-01 |
| | TH-227 | 50.10 | | 8.40 | 5.39E-01 | 5.39E-01 | -1.07E-01 | 2.59E-01 |
| | | 236.00 | | 11.50 | 5.59E-01 | | -4.29E+00 | 2.72E-01 |
| | | 256.20 | | 6.30 | 7.04E-01 | | -9.03E-02 | 3.37E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 7.72E-01 | 3.61E-01 | 1.26E+00 | 3.76E-01 |
| | | 911.07 | * | 27.70 | 3.61E-01 | | 1.08E+00 | 1.72E-01 |
| | | 969.11 | * | 16.60 | 6.98E-01 | | 8.82E-01 | 3.34E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.81E-01 | 2.81E-01 | -2.92E-01 | 1.35E-01 |
| | | 62.85 | | 4.60 | 1.01E+00 | | 3.88E-01 | 4.93E-01 |
| | | 67.67 | | 0.37 | 1.07E+01 | | -5.96E-01 | 5.19E+00 |
| | PA-231 | 283.67 | | 1.60 | 2.55E+00 | 1.91E+00 | 1.13E+00 | 1.22E+00 |
| | | 302.67 | | 2.30 | 1.91E+00 | | -1.39E+00 | 9.12E-01 |
| | TH-231 | 25.64 | | 14.70 | 1.14E-01 | 1.14E-01 | 0.00E+00 | 0.00E+00 |
| | | 84.21 | | 6.40 | 6.00E-01 | | 3.90E-01 | 2.92E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.35E+00 | 1.35E+00 | -6.18E-01 | 6.43E-01 |
| | PA-234 | 131.20 | | 20.40 | 1.58E-01 | 1.58E-01 | -6.59E-02 | 7.58E-02 |
| | | 733.99 | | 8.80 | 6.58E-01 | | -1.19E-01 | 3.06E-01 |
| | | 946.00 | | 12.00 | 5.66E-01 | | -7.45E-02 | 2.62E-01 |
| + | PA-234M | 1001.03 | * | 0.92 | 7.41E+00 | 7.41E+00 | 5.99E+00 | 3.42E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 2.15E+00 | 2.15E+00 | 1.06E+00 | 1.06E+00 |

Analysis Report for 1707087-17

HTC-A03-S003-1218-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | U-235 | 143.76 | | 10.50 | 3.99E-01 | 3.99E-01 | -1.86E-01 | 1.94E-01 |
| | | 163.35 | | 4.70 | 9.40E-01 | | 4.71E-01 | 4.56E-01 |
| | | 205.31 | | 4.70 | 9.28E-01 | | 4.16E-01 | 4.48E-01 |
| | NP-237 | 86.50 | | 12.60 | 3.53E-01 | 3.53E-01 | 4.27E-01 | 1.72E-01 |
| | NP-239 | 106.10 | | 22.70 | 7.34E+11 | 7.34E+11 | 6.12E+11 | 3.55E+11 |
| | | 228.18 | | 10.70 | 2.05E+12 | | -1.57E+10 | 9.89E+11 |
| | | 277.60 | | 14.10 | 1.71E+12 | | 1.19E+12 | 8.23E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.21E-01 | 1.21E-01 | 6.39E-02 | 5.85E-02 |
| | AM-243 | 74.67 | | 66.00 | 8.22E-02 | 8.22E-02 | -1.81E-01 | 4.02E-02 |
| + | CM-243 | 209.75 | * | 3.29 | 1.81E+00 | 4.25E-01 | 1.21E+00 | 8.81E-01 |
| | | 228.14 | | 10.60 | 4.25E-01 | | -3.25E-03 | 2.05E-01 |
| | | 277.60 | * | 14.00 | 8.25E-01 | | 3.80E-01 | 4.05E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S003-1218-01

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25: | 0 | 0 | 0 | 0 | 42 | 72 | 117 | 129 |
| 33: | 144 | 684 | 123 | 90 | 96 | 83 | 102 | 97 |
| 41: | 101 | 76 | 71 | 75 | 54 | 90 | 138 | 82 |
| 49: | 71 | 80 | 86 | 85 | 83 | 101 | 79 | 81 |
| 57: | 101 | 97 | 117 | 106 | 119 | 99 | 135 | 207 |
| 65: | 145 | 123 | 126 | 105 | 120 | 111 | 110 | 149 |
| 73: | 157 | 175 | 354 | 208 | 438 | 404 | 105 | 107 |
| 81: | 83 | 92 | 90 | 124 | 149 | 112 | 182 | 228 |
| 89: | 117 | 188 | 155 | 117 | 231 | 157 | 87 | 89 |
| 97: | 85 | 72 | 83 | 105 | 83 | 75 | 88 | 78 |
| 105: | 93 | 102 | 93 | 71 | 79 | 72 | 86 | 72 |
| 113: | 75 | 63 | 83 | 88 | 75 | 72 | 62 | 87 |
| 121: | 81 | 68 | 88 | 70 | 71 | 57 | 57 | 72 |
| 129: | 94 | 81 | 73 | 67 | 79 | 68 | 61 | 83 |
| 137: | 63 | 74 | 56 | 81 | 71 | 73 | 73 | 73 |
| 145: | 66 | 65 | 83 | 62 | 71 | 66 | 57 | 72 |
| 153: | 65 | 96 | 83 | 61 | 63 | 62 | 79 | 72 |
| 161: | 63 | 73 | 68 | 63 | 66 | 68 | 56 | 59 |
| 169: | 60 | 54 | 54 | 52 | 59 | 50 | 60 | 56 |
| 177: | 65 | 59 | 54 | 58 | 51 | 69 | 53 | 62 |
| 185: | 67 | 153 | 95 | 42 | 51 | 57 | 56 | 50 |
| 193: | 70 | 44 | 44 | 51 | 63 | 45 | 64 | 49 |
| 201: | 58 | 44 | 52 | 50 | 56 | 40 | 48 | 47 |
| 209: | 102 | 62 | 55 | 40 | 51 | 45 | 54 | 49 |
| 217: | 48 | 50 | 51 | 48 | 56 | 43 | 46 | 32 |
| 225: | 38 | 43 | 38 | 45 | 45 | 53 | 50 | 32 |
| 233: | 43 | 47 | 46 | 61 | 55 | 242 | 523 | 114 |
| 241: | 85 | 121 | 75 | 30 | 37 | 35 | 33 | 41 |
| 249: | 42 | 35 | 42 | 34 | 44 | 45 | 35 | 43 |
| 257: | 36 | 27 | 36 | 37 | 31 | 29 | 26 | 18 |
| 265: | 41 | 45 | 25 | 40 | 47 | 75 | 54 | 39 |
| 273: | 39 | 46 | 32 | 33 | 62 | 51 | 28 | 31 |
| 281: | 31 | 30 | 16 | 33 | 21 | 35 | 24 | 41 |
| 289: | 27 | 20 | 39 | 23 | 26 | 35 | 185 | 127 |
| 297: | 29 | 31 | 39 | 53 | 44 | 25 | 27 | 26 |
| 305: | 21 | 29 | 30 | 28 | 30 | 21 | 20 | 25 |
| 313: | 32 | 19 | 27 | 19 | 19 | 24 | 25 | 18 |
| 321: | 27 | 30 | 25 | 26 | 19 | 30 | 41 | 47 |
| 329: | 41 | 31 | 26 | 28 | 26 | 29 | 35 | 35 |
| 337: | 33 | 94 | 97 | 27 | 25 | 21 | 24 | 21 |
| 345: | 20 | 22 | 23 | 19 | 28 | 24 | 74 | 279 |
| 353: | 92 | 26 | 23 | 16 | 22 | 21 | 15 | 31 |
| 361: | 11 | 23 | 30 | 20 | 20 | 23 | 18 | 30 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 29 | 18 | 25 | 22 | 26 | 24 | 16 | 25 |

Sample Title: HTC-A03-S003-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 19 | 22 | 21 | 18 | 16 | 19 | 22 | 25 |
| 385: | 19 | 31 | 25 | 23 | 21 | 19 | 10 | 20 |
| 393: | 29 | 17 | 12 | 28 | 16 | 24 | 16 | 19 |
| 401: | 16 | 23 | 17 | 22 | 23 | 19 | 24 | 15 |
| 409: | 40 | 21 | 17 | 16 | 25 | 23 | 24 | 25 |
| 417: | 15 | 15 | 17 | 19 | 15 | 16 | 18 | 18 |
| 425: | 26 | 17 | 20 | 13 | 8 | 17 | 15 | 17 |
| 433: | 22 | 15 | 21 | 8 | 12 | 12 | 17 | 24 |
| 441: | 17 | 24 | 20 | 20 | 22 | 23 | 13 | 15 |
| 449: | 15 | 21 | 18 | 22 | 24 | 15 | 16 | 19 |
| 457: | 15 | 15 | 12 | 16 | 9 | 25 | 44 | 31 |
| 465: | 23 | 17 | 11 | 18 | 21 | 16 | 12 | 18 |
| 473: | 13 | 18 | 10 | 14 | 22 | 13 | 15 | 12 |
| 481: | 16 | 14 | 15 | 20 | 14 | 9 | 13 | 8 |
| 489: | 19 | 13 | 19 | 9 | 11 | 17 | 21 | 12 |
| 497: | 8 | 13 | 11 | 15 | 11 | 13 | 11 | 20 |
| 505: | 17 | 15 | 10 | 17 | 28 | 61 | 86 | 45 |
| 513: | 16 | 20 | 17 | 16 | 11 | 14 | 15 | 15 |
| 521: | 12 | 12 | 18 | 12 | 10 | 10 | 13 | 16 |
| 529: | 5 | 15 | 14 | 11 | 17 | 13 | 6 | 12 |
| 537: | 7 | 21 | 14 | 9 | 19 | 17 | 11 | 10 |
| 545: | 9 | 17 | 13 | 10 | 17 | 5 | 9 | 9 |
| 553: | 11 | 11 | 19 | 15 | 8 | 14 | 18 | 17 |
| 561: | 11 | 11 | 15 | 15 | 18 | 10 | 19 | 17 |
| 569: | 10 | 16 | 11 | 13 | 22 | 13 | 14 | 16 |
| 577: | 13 | 13 | 16 | 12 | 24 | 39 | 183 | 80 |
| 585: | 17 | 18 | 9 | 10 | 8 | 13 | 12 | 17 |
| 593: | 9 | 15 | 13 | 13 | 7 | 9 | 12 | 12 |
| 601: | 14 | 10 | 10 | 12 | 7 | 15 | 18 | 41 |
| 609: | 175 | 120 | 22 | 9 | 15 | 18 | 6 | 18 |
| 617: | 11 | 16 | 15 | 15 | 9 | 10 | 12 | 12 |
| 625: | 15 | 10 | 9 | 13 | 7 | 9 | 7 | 11 |
| 633: | 9 | 20 | 9 | 15 | 11 | 20 | 17 | 11 |
| 641: | 14 | 6 | 9 | 8 | 8 | 14 | 12 | 6 |
| 649: | 16 | 2 | 11 | 15 | 14 | 16 | 14 | 12 |
| 657: | 10 | 11 | 13 | 9 | 14 | 19 | 6 | 10 |
| 665: | 15 | 15 | 11 | 14 | 13 | 14 | 5 | 15 |
| 673: | 16 | 7 | 14 | 9 | 11 | 9 | 13 | 12 |
| 681: | 16 | 7 | 10 | 12 | 8 | 12 | 7 | 9 |
| 689: | 8 | 7 | 10 | 11 | 17 | 16 | 11 | 14 |
| 697: | 14 | 15 | 10 | 8 | 10 | 11 | 11 | 7 |
| 705: | 10 | 12 | 9 | 10 | 7 | 17 | 9 | 13 |
| 713: | 13 | 8 | 8 | 8 | 10 | 14 | 9 | 6 |
| 721: | 8 | 9 | 11 | 12 | 14 | 16 | 25 | 25 |
| 729: | 6 | 6 | 7 | 11 | 11 | 6 | 10 | 9 |
| 737: | 7 | 7 | 11 | 16 | 5 | 4 | 9 | 8 |
| 745: | 10 | 8 | 7 | 10 | 11 | 10 | 9 | 8 |
| 753: | 10 | 11 | 14 | 8 | 11 | 8 | 4 | 11 |
| 761: | 4 | 7 | 17 | 15 | 5 | 12 | 8 | 23 |
| 769: | 14 | 6 | 9 | 13 | 9 | 12 | 5 | 10 |
| 777: | 5 | 10 | 7 | 10 | 12 | 10 | 8 | 8 |
| 785: | 17 | 16 | 9 | 7 | 5 | 2 | 8 | 7 |
| 793: | 9 | 19 | 25 | 17 | 11 | 9 | 12 | 8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 5 | 12 | 14 | 8 | 9 | 13 | 10 | 8 |

Sample Title: HTC-A03-S003-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 6 | 11 | 9 | 4 | 11 | 6 | 6 | 9 |
| 817: | 10 | 6 | 5 | 4 | 12 | 8 | 12 | 10 |
| 825: | 8 | 5 | 8 | 8 | 11 | 9 | 7 | 7 |
| 833: | 6 | 9 | 4 | 17 | 6 | 5 | 16 | 20 |
| 841: | 14 | 12 | 6 | 7 | 12 | 7 | 10 | 8 |
| 849: | 6 | 6 | 6 | 6 | 6 | 5 | 10 | 11 |
| 857: | 13 | 7 | 7 | 22 | 14 | 8 | 10 | 7 |
| 865: | 12 | 3 | 6 | 7 | 7 | 10 | 3 | 7 |
| 873: | 5 | 4 | 12 | 11 | 7 | 8 | 7 | 5 |
| 881: | 7 | 6 | 8 | 6 | 10 | 6 | 9 | 6 |
| 889: | 4 | 7 | 10 | 4 | 13 | 8 | 10 | 6 |
| 897: | 5 | 5 | 5 | 11 | 9 | 7 | 12 | 5 |
| 905: | 10 | 5 | 8 | 9 | 14 | 43 | 96 | 43 |
| 913: | 9 | 9 | 11 | 4 | 11 | 8 | 11 | 12 |
| 921: | 6 | 7 | 10 | 5 | 10 | 10 | 8 | 7 |
| 929: | 8 | 2 | 8 | 9 | 11 | 16 | 10 | 9 |
| 937: | 5 | 4 | 6 | 7 | 3 | 9 | 15 | 4 |
| 945: | 11 | 4 | 8 | 4 | 5 | 16 | 10 | 3 |
| 953: | 10 | 5 | 8 | 3 | 8 | 10 | 5 | 3 |
| 961: | 6 | 12 | 11 | 17 | 24 | 11 | 12 | 42 |
| 969: | 52 | 23 | 9 | 10 | 4 | 5 | 7 | 3 |
| 977: | 6 | 5 | 11 | 7 | 4 | 6 | 7 | 8 |
| 985: | 8 | 9 | 6 | 11 | 8 | 10 | 4 | 6 |
| 993: | 8 | 4 | 4 | 9 | 2 | 9 | 8 | 9 |
| 1001: | 8 | 13 | 3 | 1 | 6 | 10 | 7 | 10 |
| 1009: | 2 | 8 | 6 | 5 | 8 | 8 | 6 | 4 |
| 1017: | 6 | 3 | 9 | 6 | 7 | 7 | 10 | 6 |
| 1025: | 9 | 3 | 9 | 7 | 4 | 7 | 4 | 7 |
| 1033: | 5 | 9 | 9 | 8 | 8 | 4 | 5 | 9 |
| 1041: | 9 | 7 | 7 | 11 | 8 | 8 | 6 | 3 |
| 1049: | 6 | 4 | 7 | 7 | 10 | 7 | 5 | 7 |
| 1057: | 4 | 6 | 9 | 7 | 5 | 9 | 12 | 9 |
| 1065: | 4 | 7 | 11 | 4 | 6 | 5 | 3 | 10 |
| 1073: | 5 | 3 | 6 | 6 | 2 | 7 | 9 | 2 |
| 1081: | 4 | 7 | 5 | 7 | 7 | 11 | 5 | 12 |
| 1089: | 3 | 7 | 6 | 8 | 6 | 2 | 7 | 14 |
| 1097: | 9 | 7 | 2 | 7 | 9 | 6 | 5 | 3 |
| 1105: | 8 | 7 | 10 | 9 | 9 | 6 | 16 | 8 |
| 1113: | 5 | 6 | 3 | 8 | 3 | 16 | 23 | 45 |
| 1121: | 31 | 10 | 3 | 8 | 4 | 5 | 8 | 9 |
| 1129: | 12 | 10 | 11 | 7 | 7 | 5 | 5 | 6 |
| 1137: | 8 | 5 | 4 | 4 | 5 | 8 | 9 | 8 |
| 1145: | 6 | 7 | 9 | 7 | 6 | 8 | 8 | 8 |
| 1153: | 7 | 8 | 12 | 9 | 7 | 2 | 6 | 10 |
| 1161: | 2 | 9 | 8 | 7 | 6 | 9 | 8 | 3 |
| 1169: | 7 | 6 | 9 | 4 | 12 | 9 | 10 | 9 |
| 1177: | 10 | 9 | 7 | 9 | 7 | 10 | 8 | 12 |
| 1185: | 7 | 10 | 12 | 4 | 8 | 13 | 7 | 5 |
| 1193: | 10 | 11 | 7 | 7 | 6 | 10 | 8 | 9 |
| 1201: | 11 | 8 | 8 | 10 | 3 | 8 | 13 | 6 |
| 1209: | 11 | 11 | 10 | 9 | 12 | 9 | 5 | 8 |
| 1217: | 10 | 10 | 11 | 11 | 8 | 10 | 10 | 9 |
| 1225: | 6 | 8 | 13 | 8 | 11 | 7 | 6 | 8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 5 | 7 | 11 | 17 | 16 | 18 | 9 | 13 |

Sample Title: HTC-A03-S003-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 7 | 6 | 12 | 11 | 10 | 8 | 4 | 4 |
| 1249: | 6 | 8 | 4 | 7 | 9 | 6 | 2 | 7 |
| 1257: | 9 | 8 | 11 | 7 | 0 | 7 | 5 | 1 |
| 1265: | 3 | 12 | 4 | 4 | 4 | 2 | 2 | 8 |
| 1273: | 7 | 7 | 2 | 4 | 4 | 7 | 7 | 6 |
| 1281: | 7 | 6 | 2 | 3 | 1 | 2 | 4 | 5 |
| 1289: | 6 | 10 | 10 | 2 | 8 | 5 | 9 | 6 |
| 1297: | 7 | 3 | 6 | 4 | 6 | 5 | 9 | 6 |
| 1305: | 6 | 6 | 3 | 4 | 6 | 6 | 8 | 4 |
| 1313: | 10 | 4 | 3 | 6 | 3 | 7 | 7 | 4 |
| 1321: | 4 | 3 | 5 | 8 | 6 | 6 | 7 | 7 |
| 1329: | 9 | 8 | 3 | 5 | 4 | 5 | 3 | 2 |
| 1337: | 5 | 4 | 4 | 6 | 2 | 4 | 2 | 1 |
| 1345: | 1 | 8 | 5 | 2 | 4 | 2 | 2 | 4 |
| 1353: | 5 | 2 | 3 | 1 | 5 | 5 | 4 | 3 |
| 1361: | 5 | 4 | 4 | 5 | 5 | 1 | 2 | 6 |
| 1369: | 1 | 4 | 2 | 1 | 5 | 3 | 7 | 5 |
| 1377: | 8 | 6 | 1 | 0 | 3 | 1 | 4 | 5 |
| 1385: | 2 | 2 | 3 | 2 | 4 | 3 | 5 | 1 |
| 1393: | 3 | 0 | 1 | 4 | 4 | 0 | 3 | 1 |
| 1401: | 4 | 2 | 2 | 2 | 3 | 2 | 6 | 7 |
| 1409: | 4 | 0 | 4 | 2 | 1 | 5 | 0 | 3 |
| 1417: | 4 | 3 | 4 | 4 | 2 | 1 | 3 | 1 |
| 1425: | 1 | 2 | 2 | 1 | 1 | 4 | 2 | 2 |
| 1433: | 4 | 2 | 4 | 2 | 5 | 5 | 3 | 6 |
| 1441: | 1 | 2 | 3 | 4 | 1 | 4 | 5 | 2 |
| 1449: | 4 | 2 | 4 | 4 | 2 | 1 | 5 | 4 |
| 1457: | 14 | 35 | 142 | 318 | 294 | 92 | 6 | 0 |
| 1465: | 1 | 2 | 2 | 0 | 2 | 3 | 2 | 0 |
| 1473: | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| 1481: | 1 | 2 | 0 | 2 | 3 | 0 | 0 | 1 |
| 1489: | 2 | 3 | 1 | 5 | 0 | 2 | 2 | 6 |
| 1497: | 2 | 0 | 4 | 4 | 2 | 4 | 3 | 4 |
| 1505: | 1 | 1 | 4 | 3 | 7 | 5 | 1 | 2 |
| 1513: | 1 | 1 | 2 | 0 | 0 | 2 | 2 | 1 |
| 1521: | 2 | 2 | 1 | 1 | 4 | 2 | 0 | 0 |
| 1529: | 2 | 1 | 1 | 3 | 2 | 0 | 0 | 1 |
| 1537: | 4 | 4 | 1 | 2 | 3 | 2 | 6 | 0 |
| 1545: | 1 | 2 | 1 | 0 | 2 | 3 | 1 | 0 |
| 1553: | 1 | 1 | 1 | 3 | 2 | 0 | 4 | 3 |
| 1561: | 2 | 5 | 1 | 0 | 0 | 3 | 1 | 1 |
| 1569: | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 1577: | 1 | 2 | 6 | 4 | 3 | 3 | 2 | 2 |
| 1585: | 3 | 2 | 6 | 3 | 8 | 6 | 2 | 8 |
| 1593: | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 3 |
| 1601: | 0 | 0 | 0 | 0 | 1 | 1 | 3 | 1 |
| 1609: | 0 | 1 | 2 | 3 | 1 | 2 | 1 | 2 |
| 1617: | 1 | 4 | 5 | 6 | 1 | 2 | 3 | 3 |
| 1625: | 6 | 2 | 0 | 1 | 0 | 3 | 4 | 2 |
| 1633: | 1 | 3 | 1 | 0 | 3 | 2 | 1 | 2 |
| 1641: | 2 | 3 | 1 | 1 | 1 | 0 | 3 | 0 |
| 1649: | 0 | 1 | 3 | 1 | 2 | 1 | 0 | 0 |
| 1657: | 0 | 2 | 0 | 3 | 2 | 1 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 3 | 2 | 0 | 0 | 1 | 1 | 3 | 0 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 1681: | 0 | 0 | 0 | 1 | 1 | 3 | 1 | 0 |
| 1689: | 0 | 2 | 2 | 1 | 1 | 1 | 1 | 2 |
| 1697: | 1 | 0 | 3 | 0 | 2 | 0 | 1 | 0 |
| 1705: | 3 | 0 | 4 | 3 | 0 | 0 | 0 | 0 |
| 1713: | 1 | 0 | 0 | 0 | 1 | 3 | 3 | 1 |
| 1721: | 2 | 0 | 1 | 1 | 1 | 0 | 0 | 2 |
| 1729: | 7 | 6 | 1 | 2 | 2 | 0 | 1 | 0 |
| 1737: | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 0 |
| 1745: | 1 | 3 | 1 | 2 | 1 | 1 | 0 | 2 |
| 1753: | 3 | 0 | 0 | 0 | 2 | 1 | 0 | 4 |
| 1761: | 1 | 9 | 24 | 17 | 14 | 3 | 0 | 0 |
| 1769: | 3 | 1 | 1 | 1 | 0 | 1 | 0 | 0 |
| 1777: | 1 | 1 | 2 | 0 | 1 | 3 | 0 | 0 |
| 1785: | 2 | 2 | 3 | 1 | 1 | 0 | 3 | 5 |
| 1793: | 1 | 0 | 0 | 2 | 1 | 2 | 1 | 1 |
| 1801: | 0 | 0 | 0 | 3 | 2 | 2 | 0 | 2 |
| 1809: | 1 | 2 | 3 | 4 | 1 | 0 | 1 | 1 |
| 1817: | 1 | 1 | 0 | 5 | 1 | 1 | 0 | 0 |
| 1825: | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 1 |
| 1833: | 2 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 1841: | 0 | 1 | 0 | 3 | 2 | 4 | 0 | 3 |
| 1849: | 2 | 1 | 1 | 0 | 2 | 0 | 1 | 2 |
| 1857: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1865: | 0 | 3 | 1 | 1 | 1 | 0 | 0 | 0 |
| 1873: | 2 | 1 | 1 | 2 | 0 | 2 | 1 | 1 |
| 1881: | 0 | 2 | 1 | 0 | 1 | 1 | 4 | 3 |
| 1889: | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 |
| 1897: | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 0 |
| 1905: | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |
| 1913: | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 3 |
| 1921: | 2 | 0 | 0 | 1 | 4 | 1 | 2 | 2 |
| 1929: | 1 | 2 | 0 | 2 | 1 | 0 | 0 | 1 |
| 1937: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 1945: | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 2 |
| 1953: | 1 | 3 | 0 | 2 | 1 | 0 | 0 | 1 |
| 1961: | 1 | 5 | 0 | 0 | 2 | 0 | 0 | 0 |
| 1969: | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1977: | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 0 |
| 1985: | 1 | 0 | 4 | 0 | 0 | 1 | 0 | 0 |
| 1993: | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2001: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 2009: | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 2017: | 2 | 1 | 1 | 1 | 1 | 4 | 2 | 2 |
| 2025: | 0 | 1 | 3 | 2 | 1 | 0 | 1 | 3 |
| 2033: | 1 | 0 | 1 | 0 | 0 | 1 | 2 | 1 |
| 2041: | 0 | 1 | 0 | 1 | 2 | 1 | 1 | 1 |
| 2049: | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 0 |
| 2057: | 1 | 1 | 0 | 1 | 0 | 0 | 4 | 1 |
| 2065: | 1 | 1 | 2 | 1 | 0 | 1 | 3 | 0 |
| 2073: | 1 | 0 | 1 | 1 | 0 | 0 | 3 | 0 |
| 2081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2089: | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 1 | 0 | 4 | 3 | 2 | 5 | 3 | 4 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 2 |
| 2113: | 2 | 0 | 1 | 1 | 4 | 2 | 3 | 1 |
| 2121: | 1 | 2 | 1 | 0 | 1 | 1 | 0 | 0 |
| 2129: | 1 | 0 | 2 | 2 | 1 | 1 | 1 | 2 |
| 2137: | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 1 |
| 2145: | 1 | 0 | 1 | 2 | 2 | 0 | 0 | 0 |
| 2153: | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 2 |
| 2161: | 0 | 1 | 1 | 4 | 1 | 0 | 0 | 3 |
| 2169: | 4 | 3 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2177: | 1 | 0 | 1 | 1 | 3 | 1 | 3 | 2 |
| 2185: | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 1 |
| 2193: | 0 | 0 | 1 | 3 | 1 | 1 | 1 | 2 |
| 2201: | 1 | 3 | 4 | 4 | 1 | 0 | 0 | 1 |
| 2209: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2217: | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 0 |
| 2225: | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 2 |
| 2233: | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2241: | 3 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2249: | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2257: | 2 | 2 | 0 | 1 | 1 | 2 | 1 | 1 |
| 2265: | 0 | 1 | 0 | 1 | 2 | 0 | 1 | 0 |
| 2273: | 1 | 3 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2281: | 1 | 0 | 0 | 3 | 0 | 4 | 3 | 0 |
| 2289: | 0 | 3 | 1 | 2 | 2 | 2 | 0 | 1 |
| 2297: | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 1 |
| 2305: | 2 | 2 | 0 | 0 | 2 | 0 | 2 | 2 |
| 2313: | 1 | 0 | 2 | 0 | 2 | 3 | 1 | 0 |
| 2321: | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2329: | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| 2337: | 2 | 2 | 0 | 1 | 1 | 3 | 1 | 1 |
| 2345: | 0 | 1 | 1 | 1 | 1 | 0 | 3 | 0 |
| 2353: | 1 | 1 | 1 | 1 | 3 | 0 | 1 | 1 |
| 2361: | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 |
| 2369: | 1 | 1 | 0 | 4 | 1 | 1 | 1 | 0 |
| 2377: | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2385: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2393: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2401: | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 0 |
| 2409: | 0 | 0 | 2 | 0 | 0 | 3 | 2 | 0 |
| 2417: | 1 | 0 | 1 | 2 | 0 | 1 | 1 | 1 |
| 2425: | 1 | 3 | 2 | 0 | 2 | 0 | 2 | 0 |
| 2433: | 0 | 0 | 2 | 0 | 0 | 2 | 1 | 0 |
| 2441: | 1 | 1 | 1 | 0 | 2 | 3 | 4 | 2 |
| 2449: | 1 | 2 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2457: | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2465: | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 |
| 2473: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2481: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2489: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2497: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2505: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2513: | 3 | 0 | 1 | 0 | 0 | 1 | 1 | 0 |
| 2521: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |

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| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 1 | 1 | 0 | 0 | 1 | 2 | 0 | 0 |
| 2545: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2553: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2561: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2569: | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 |
| 2577: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 2585: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2593: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2601: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 2609: | 2 | 4 | 6 | 15 | 29 | 22 | 14 | 3 |
| 2617: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2625: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2633: | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2641: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2649: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2657: | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 2665: | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2673: | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 2681: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2689: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2697: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2713: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2721: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2729: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2745: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2753: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2761: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2785: | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 0 |
| 2793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2801: | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 |
| 2809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2817: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2825: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2841: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2849: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 2865: | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 |
| 2873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2881: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2889: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2897: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2913: | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| 2921: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2929: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3001: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3017: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3025: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3065: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3089: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3129: | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| 3137: | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3153: | 1 | 3 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3161: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3177: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 |
| 3193: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3201: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3209: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3233: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3241: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3281: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3345: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3353: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-1218-01

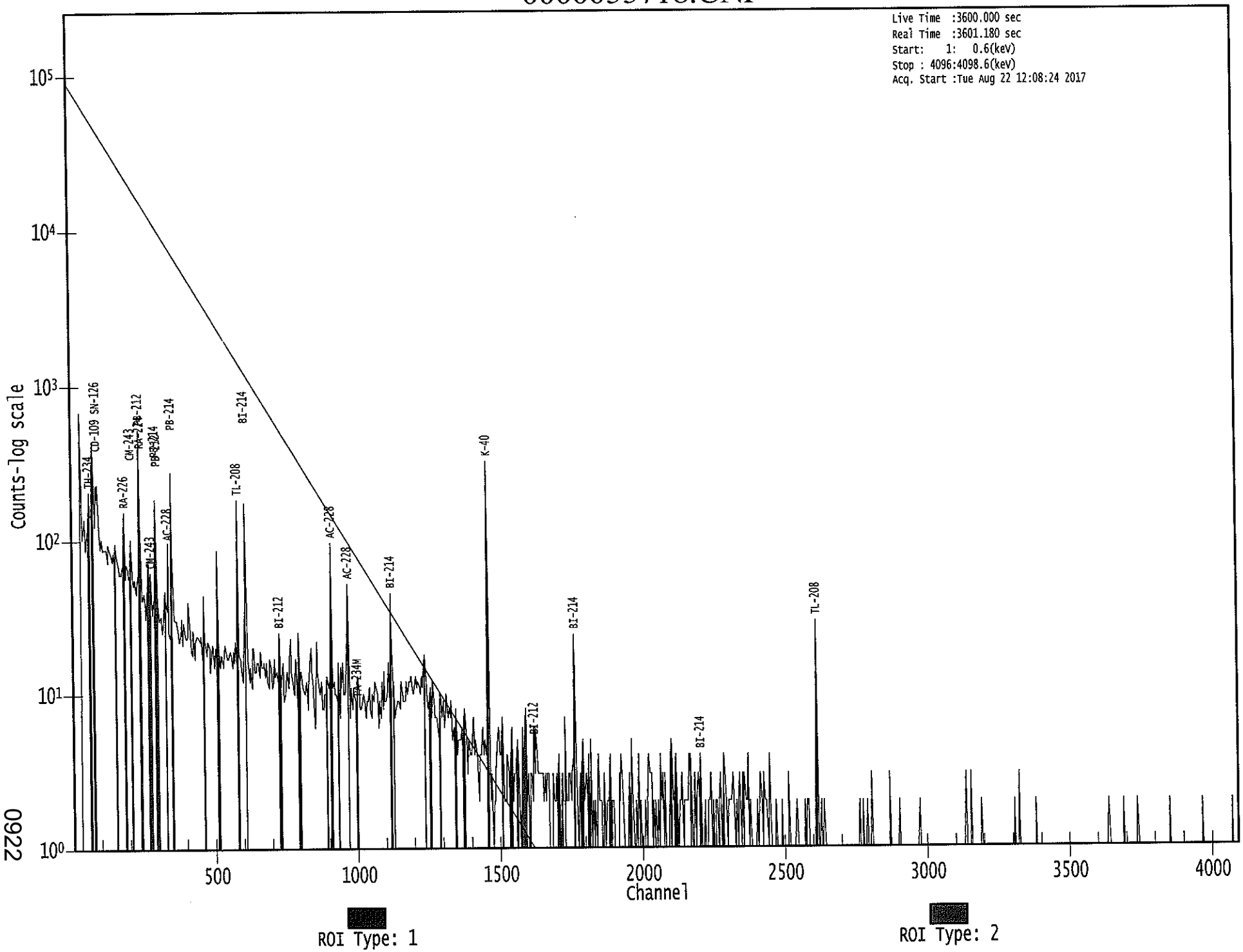
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3409: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3449: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3505: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3601: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3633: | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 3641: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3737: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3753: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3769: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3817: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-1218-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 |
| 3857: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3985: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4025: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 4081: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |

# 0000055718.CNF




0922

Apex-Gamma

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-18 |
| Sample Description | : HTC-A03-S003-1824-01 |
| Sample Type | : SOIL |
| Sample Size | : 7.079E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:47:24AM |
| Acquisition Started | : 8/22/2017 12:08:31PM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE3 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3608.4 seconds |
| Dead Time | : 0.23 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 9 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55725 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG 8/23/17

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 1:15:55PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 47.30 | 47.61 | 0.0000 | 0.00 |
| 2 | 63.70 | 64.01 | 0.0000 | 0.00 |
| 3 | 76.71 | 77.01 | 0.0000 | 0.00 |
| 4 | 93.57 | 93.87 | 0.0000 | 0.00 |
| 5 | 186.68 | 186.95 | 0.0000 | 0.00 |
| 6 | 209.47 | 209.73 | 0.0000 | 0.00 |
| 7 | 239.11 | 239.36 | 0.0000 | 0.00 |
| 8 | 242.04 | 242.28 | 0.0000 | 0.00 |
| 9 | 259.89 | 260.13 | 0.0000 | 0.00 |
| 10 | 270.35 | 270.59 | 0.0000 | 0.00 |
| 11 | 295.38 | 295.61 | 0.0000 | 0.00 |
| 12 | 328.55 | 328.77 | 0.0000 | 0.00 |
| 13 | 338.87 | 339.09 | 0.0000 | 0.00 |
| 14 | 352.20 | 352.41 | 0.0000 | 0.00 |
| 15 | 463.44 | 463.61 | 0.0000 | 0.00 |
| 16 | 511.44 | 511.60 | 0.0000 | 0.00 |
| 17 | 583.54 | 583.67 | 0.0000 | 0.00 |
| 18 | 609.90 | 610.02 | 0.0000 | 0.00 |
| 19 | 727.61 | 727.69 | 0.0000 | 0.00 |
| 20 | 768.49 | 768.56 | 0.0000 | 0.00 |
| 21 | 787.00 | 787.06 | 0.0000 | 0.00 |
| 22 | 794.79 | 794.85 | 0.0000 | 0.00 |
| 23 | 911.53 | 911.55 | 0.0000 | 0.00 |
| 24 | 934.62 | 934.63 | 0.0000 | 0.00 |
| 25 | 942.86 | 942.86 | 0.0000 | 0.00 |
| 26 | 964.45 | 964.45 | 0.0000 | 0.00 |
| 27 | 969.45 | 969.45 | 0.0000 | 0.00 |
| 28 | 1003.83 | 1003.82 | 0.0000 | 0.00 |
| 29 | 1120.48 | 1120.43 | 0.0000 | 0.00 |
| 30 | 1200.82 | 1200.74 | 0.0000 | 0.00 |
| 31 | 1234.86 | 1234.77 | 0.0000 | 0.00 |
| 32 | 1239.34 | 1239.25 | 0.0000 | 0.00 |
| 33 | 1349.19 | 1349.06 | 0.0000 | 0.00 |
| 34 | 1414.51 | 1414.36 | 0.0000 | 0.00 |
| 35 | 1424.30 | 1424.14 | 0.0000 | 0.00 |
| 36 | 1461.04 | 1460.88 | 0.0000 | 0.00 |
| 37 | 1676.46 | 1676.22 | 0.0000 | 0.00 |
| 38 | 1708.56 | 1708.31 | 0.0000 | 0.00 |
| 39 | 1753.35 | 1753.08 | 0.0000 | 0.00 |
| 40 | 1765.60 | 1765.33 | 0.0000 | 0.00 |
| 41 | 1816.13 | 1815.85 | 0.0000 | 0.00 |
| 42 | 1886.65 | 1886.34 | 0.0000 | 0.00 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1892.96 | 1892.64 | 0.0000 | 0.00 |
| 44 | 1979.12 | 1978.78 | 0.0000 | 0.00 |
| 45 | 2204.91 | 2204.50 | 0.0000 | 0.00 |
| 46 | 2241.31 | 2240.88 | 0.0000 | 0.00 |
| 47 | 2419.99 | 2419.50 | 0.0000 | 0.00 |
| 48 | 2431.16 | 2430.67 | 0.0000 | 0.00 |
| 49 | 2447.28 | 2446.78 | 0.0000 | 0.00 |
| 50 | 2614.62 | 2614.06 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 1:15:55PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 47.30 | 44 - | 52 | 47.61 | 1.39E+02 | 111.56 | 1.84E+03 | 1.85 |
| | 2 | 63.70 | 61 - | 67 | 64.01 | 1.58E+02 | 106.48 | 1.95E+03 | 2.77 |
| | 3 | 76.71 | 73 - | 84 | 77.01 | 9.89E+02 | 180.65 | 3.56E+03 | 3.44 |
| | 4 | 93.57 | 92 - | 99 | 93.87 | 2.32E+02 | 112.71 | 1.88E+03 | 1.83 |
| | 5 | 186.68 | 183 - | 191 | 186.95 | 1.40E+02 | 89.53 | 1.15E+03 | 2.34 |
| | 6 | 209.47 | 206 - | 214 | 209.73 | 8.04E+01 | 79.60 | 9.21E+02 | 2.95 |
| M | 7 | 239.11 | 234 - | 246 | 239.36 | 7.92E+02 | 78.20 | 5.90E+02 | 2.06 |
| m | 8 | 242.04 | 234 - | 246 | 242.28 | 1.66E+02 | 79.04 | 5.25E+02 | 2.06 |
| | 9 | 259.89 | 257 - | 263 | 260.13 | 4.12E+01 | 51.38 | 4.48E+02 | 1.33 |
| | 10 | 270.35 | 266 - | 276 | 270.59 | 7.69E+01 | 78.37 | 7.84E+02 | 3.21 |
| | 11 | 295.38 | 291 - | 300 | 295.61 | 1.90E+02 | 77.87 | 7.63E+02 | 1.71 |
| | 12 | 328.55 | 325 - | 333 | 328.77 | 4.81E+01 | 57.43 | 4.80E+02 | 1.49 |
| | 13 | 338.87 | 333 - | 345 | 339.09 | 1.85E+02 | 75.79 | 5.80E+02 | 2.64 |
| | 14 | 352.20 | 346 - | 357 | 352.41 | 4.62E+02 | 75.71 | 4.85E+02 | 2.12 |
| | 15 | 463.44 | 458 - | 468 | 463.61 | 5.00E+01 | 52.42 | 3.36E+02 | 3.23 |
| | 16 | 511.44 | 507 - | 516 | 511.60 | 1.32E+02 | 53.31 | 3.32E+02 | 2.68 |
| | 17 | 583.54 | 579 - | 587 | 583.67 | 2.27E+02 | 48.38 | 2.21E+02 | 2.47 |
| | 18 | 609.90 | 606 - | 615 | 610.02 | 2.85E+02 | 55.01 | 2.68E+02 | 1.92 |
| | 19 | 727.61 | 724 - | 731 | 727.69 | 4.07E+01 | 33.94 | 1.67E+02 | 1.27 |
| | 20 | 768.49 | 762 - | 775 | 768.56 | 6.41E+01 | 48.26 | 2.28E+02 | 2.49 |
| | 21 | 787.00 | 785 - | 790 | 787.06 | 2.52E+01 | 20.86 | 6.36E+01 | 1.71 |
| | 22 | 794.79 | 791 - | 799 | 794.85 | 4.51E+01 | 27.73 | 9.18E+01 | 4.01 |
| | 23 | 911.53 | 908 - | 915 | 911.55 | 1.38E+02 | 34.29 | 1.03E+02 | 2.12 |
| | 24 | 934.62 | 930 - | 939 | 934.63 | 2.66E+01 | 29.36 | 1.03E+02 | 1.54 |
| | 25 | 942.86 | 940 - | 946 | 942.86 | 1.74E+01 | 20.99 | 6.92E+01 | 1.87 |
| M | 26 | 964.45 | 961 - | 973 | 964.45 | 4.21E+01 | 29.05 | 1.16E+02 | 2.59 |
| m | 27 | 969.45 | 961 - | 973 | 969.45 | 6.43E+01 | 28.83 | 9.54E+01 | 2.32 |
| | 28 | 1003.83 | 997 - | 1012 | 1003.82 | 6.33E+01 | 41.18 | 1.45E+02 | 13.28 |
| | 29 | 1120.48 | 1116 - | 1125 | 1120.43 | 4.77E+01 | 39.33 | 1.91E+02 | 2.24 |
| | 30 | 1200.82 | 1198 - | 1203 | 1200.74 | 2.18E+01 | 21.38 | 7.23E+01 | 2.86 |
| M | 31 | 1234.86 | 1232 - | 1249 | 1234.77 | 1.68E+01 | 18.40 | 5.76E+01 | 2.48 |
| m | 32 | 1239.34 | 1232 - | 1249 | 1239.25 | 3.33E+01 | 31.73 | 1.16E+02 | 3.00 |
| | 33 | 1349.19 | 1343 - | 1359 | 1349.06 | 2.56E+01 | 30.04 | 7.47E+01 | 4.41 |
| | 34 | 1414.51 | 1410 - | 1419 | 1414.36 | 2.30E+01 | 17.26 | 2.81E+01 | 4.57 |
| | 35 | 1424.30 | 1420 - | 1429 | 1424.14 | 1.30E+01 | 13.86 | 2.00E+01 | 2.77 |
| | 36 | 1461.04 | 1455 - | 1466 | 1460.88 | 7.13E+02 | 57.31 | 5.38E+01 | 2.10 |
| | 37 | 1676.46 | 1673 - | 1679 | 1676.22 | 7.17E+00 | 6.95 | 3.67E+00 | 1.07 |
| | 38 | 1708.56 | 1705 - | 1711 | 1708.31 | 5.00E+00 | 7.52 | 6.00E+00 | 6.46 |
| | 39 | 1753.35 | 1749 - | 1756 | 1753.08 | 7.15E+00 | 10.00 | 1.17E+01 | 1.68 |
| | 40 | 1765.60 | 1759 - | 1774 | 1765.33 | 6.90E+01 | 16.61 | 0.00E+00 | 3.47 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|
| 41 | 1816.13 | 1812 - | 1818 | 1815.85 | 5.21E+00 | 6.34 | 3.57E+00 | 1.90 |
| 42 | 1886.65 | 1884 - | 1889 | 1886.34 | 5.95E+00 | 8.19 | 8.10E+00 | 2.43 |
| 43 | 1892.96 | 1890 - | 1896 | 1892.64 | 6.75E+00 | 6.65 | 2.50E+00 | 1.09 |
| 44 | 1979.12 | 1975 - | 1981 | 1978.78 | 9.00E+00 | 6.00 | 0.00E+00 | 1.45 |
| 45 | 2204.91 | 2201 - | 2209 | 2204.50 | 1.58E+01 | 12.20 | 1.25E+01 | 2.52 |
| 46 | 2241.31 | 2236 - | 2246 | 2240.88 | 1.70E+01 | 8.25 | 0.00E+00 | 1.45 |
| 47 | 2419.99 | 2414 - | 2425 | 2419.50 | 1.40E+01 | 7.48 | 0.00E+00 | 6.92 |
| 48 | 2431.16 | 2426 - | 2434 | 2430.67 | 9.00E+00 | 6.00 | 0.00E+00 | 5.72 |
| 49 | 2447.28 | 2443 - | 2449 | 2446.78 | 7.92E+00 | 9.42 | 1.02E+01 | 3.40 |
| 50 | 2614.62 | 2609 - | 2618 | 2614.06 | 7.05E+01 | 17.80 | 4.90E+00 | 3.11 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 1:15:55PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 1 | 47.30 | 44 - | 52 | 1.39E+02 | 111.56 | 1.84E+03 | 8.96E+01 |
| | 2 | 63.70 | 61 - | 67 | 1.58E+02 | 106.48 | 1.95E+03 | 8.50E+01 |
| | 3 | 76.71 | 73 - | 84 | 9.89E+02 | 180.65 | 3.56E+03 | 1.39E+02 |
| | 4 | 93.57 | 92 - | 99 | 2.32E+02 | 112.71 | 1.88E+03 | 8.92E+01 |
| | 5 | 186.68 | 183 - | 191 | 1.40E+02 | 89.53 | 1.15E+03 | 7.10E+01 |
| | 6 | 209.47 | 206 - | 214 | 8.04E+01 | 79.60 | 9.21E+02 | 6.37E+01 |
| M | 7 | 239.11 | 234 - | 246 | 7.92E+02 | 78.20 | 5.90E+02 | 3.99E+01 |
| m | 8 | 242.04 | 234 - | 246 | 1.66E+02 | 79.04 | 5.25E+02 | 3.77E+01 |
| | 9 | 259.89 | 257 - | 263 | 4.12E+01 | 51.38 | 4.48E+02 | 4.09E+01 |
| | 10 | 270.35 | 266 - | 276 | 7.69E+01 | 78.37 | 7.84E+02 | 6.28E+01 |
| | 11 | 295.38 | 291 - | 300 | 1.90E+02 | 77.87 | 7.63E+02 | 5.99E+01 |
| | 12 | 328.55 | 325 - | 333 | 4.81E+01 | 57.43 | 4.80E+02 | 4.58E+01 |
| | 13 | 338.87 | 333 - | 345 | 1.85E+02 | 75.79 | 5.80E+02 | 5.81E+01 |
| | 14 | 352.20 | 346 - | 357 | 4.62E+02 | 75.71 | 4.85E+02 | 5.12E+01 |
| | 15 | 463.44 | 458 - | 468 | 5.00E+01 | 52.42 | 3.36E+02 | 4.15E+01 |
| | 16 | 511.44 | 507 - | 516 | 1.32E+02 | 53.31 | 3.32E+02 | 3.95E+01 |
| | 17 | 583.54 | 579 - | 587 | 2.27E+02 | 48.38 | 2.21E+02 | 3.11E+01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| | 18 | 609.90 | 606 - | 615 | 2.85E+02 | 55.01 | 2.68E+02 | 3.57E+01 |
| | 19 | 727.61 | 724 - | 731 | 4.07E+01 | 33.94 | 1.67E+02 | 2.59E+01 |
| | 20 | 768.49 | 762 - | 775 | 6.41E+01 | 48.26 | 2.28E+02 | 3.74E+01 |
| | 21 | 787.00 | 785 - | 790 | 2.52E+01 | 20.86 | 6.36E+01 | 1.50E+01 |
| | 22 | 794.79 | 791 - | 799 | 4.51E+01 | 27.73 | 9.18E+01 | 1.99E+01 |
| | 23 | 911.53 | 908 - | 915 | 1.38E+02 | 34.29 | 1.03E+02 | 2.05E+01 |
| | 24 | 934.62 | 930 - | 939 | 2.66E+01 | 29.36 | 1.03E+02 | 2.26E+01 |
| | 25 | 942.86 | 940 - | 946 | 1.74E+01 | 20.99 | 6.92E+01 | 1.58E+01 |
| M | 26 | 964.45 | 961 - | 973 | 4.21E+01 | 29.05 | 1.16E+02 | 1.77E+01 |
| m | 27 | 969.45 | 961 - | 973 | 6.43E+01 | 28.83 | 9.54E+01 | 1.61E+01 |
| | 28 | 1003.83 | 997 - | 1012 | 6.33E+01 | 41.18 | 1.45E+02 | 3.12E+01 |
| | 29 | 1120.48 | 1116 - | 1125 | 4.77E+01 | 39.33 | 1.91E+02 | 3.03E+01 |
| | 30 | 1200.82 | 1198 - | 1203 | 2.18E+01 | 21.38 | 7.23E+01 | 1.58E+01 |
| M | 31 | 1234.86 | 1232 - | 1249 | 1.68E+01 | 18.40 | 5.76E+01 | 1.25E+01 |
| m | 32 | 1239.34 | 1232 - | 1249 | 3.33E+01 | 31.73 | 1.16E+02 | 1.77E+01 |
| | 33 | 1349.19 | 1343 - | 1359 | 2.56E+01 | 30.04 | 7.47E+01 | 2.32E+01 |
| | 34 | 1414.51 | 1410 - | 1419 | 2.30E+01 | 17.26 | 2.81E+01 | 1.18E+01 |
| | 35 | 1424.30 | 1420 - | 1429 | 1.30E+01 | 13.86 | 2.00E+01 | 9.73E+00 |
| | 36 | 1461.04 | 1455 - | 1466 | 7.13E+02 | 57.31 | 5.38E+01 | 1.71E+01 |
| | 37 | 1676.46 | 1673 - | 1679 | 7.17E+00 | 6.95 | 3.67E+00 | 3.64E+00 |
| | 38 | 1708.56 | 1705 - | 1711 | 5.00E+00 | 7.52 | 6.00E+00 | 4.97E+00 |
| | 39 | 1753.35 | 1749 - | 1756 | 7.15E+00 | 10.00 | 1.17E+01 | 6.95E+00 |
| | 40 | 1765.60 | 1759 - | 1774 | 6.90E+01 | 16.61 | 0.00E+00 | 0.00E+00 |
| | 41 | 1816.13 | 1812 - | 1818 | 5.21E+00 | 6.34 | 3.57E+00 | 3.62E+00 |
| | 42 | 1886.65 | 1884 - | 1889 | 5.95E+00 | 8.19 | 8.10E+00 | 5.40E+00 |
| | 43 | 1892.96 | 1890 - | 1896 | 6.75E+00 | 6.65 | 2.50E+00 | 3.41E+00 |
| | 44 | 1979.12 | 1975 - | 1981 | 9.00E+00 | 6.00 | 0.00E+00 | 0.00E+00 |
| | 45 | 2204.91 | 2201 - | 2209 | 1.58E+01 | 12.20 | 1.25E+01 | 7.61E+00 |
| | 46 | 2241.31 | 2236 - | 2246 | 1.70E+01 | 8.25 | 0.00E+00 | 0.00E+00 |
| | 47 | 2419.99 | 2414 - | 2425 | 1.40E+01 | 7.48 | 0.00E+00 | 0.00E+00 |
| | 48 | 2431.16 | 2426 - | 2434 | 9.00E+00 | 6.00 | 0.00E+00 | 0.00E+00 |
| | 49 | 2447.28 | 2443 - | 2449 | 7.92E+00 | 9.42 | 1.02E+01 | 6.21E+00 |
| | 50 | 2614.62 | 2609 - | 2618 | 7.05E+01 | 17.80 | 4.90E+00 | 4.85E+00 |

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

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 1:15:55PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 47.30 | 44 - | 52 | 47.61 | 1.39E+02 | 111.56 | 1.84E+03 | PB-210 |
| | 2 | 63.70 | 61 - | 67 | 64.01 | 1.58E+02 | 106.48 | 1.95E+03 | TH-234 |
| | | | | | | | | | TH-230 |
| | 3 | 76.71 | 73 - | 84 | 77.01 | 9.89E+02 | 180.65 | 3.56E+03 | ..... |
| | 4 | 93.57 | 92 - | 99 | 93.87 | 2.32E+02 | 112.71 | 1.88E+03 | GA-67 |
| | 5 | 186.68 | 183 - | 191 | 186.95 | 1.40E+02 | 89.53 | 1.15E+03 | RA-226 |
| | 6 | 209.47 | 206 - | 214 | 209.73 | 8.04E+01 | 79.60 | 9.21E+02 | CM-243 |
| | | | | | | | | | GA-67 |
| M | 7 | 239.11 | 234 - | 246 | 239.36 | 7.92E+02 | 78.20 | 5.90E+02 | PB-212 |
| m | 8 | 242.04 | 234 - | 246 | 242.28 | 1.66E+02 | 79.04 | 5.25E+02 | ..... |
| | 9 | 259.89 | 257 - | 263 | 260.13 | 4.12E+01 | 51.38 | 4.48E+02 | ..... |
| | 10 | 270.35 | 266 - | 276 | 270.59 | 7.69E+01 | 78.37 | 7.84E+02 | ..... |
| | 11 | 295.38 | 291 - | 300 | 295.61 | 1.90E+02 | 77.87 | 7.63E+02 | PB-214 |
| | 12 | 328.55 | 325 - | 333 | 328.77 | 4.81E+01 | 57.43 | 4.80E+02 | LA-140 |
| | 13 | 338.87 | 333 - | 345 | 339.09 | 1.85E+02 | 75.79 | 5.80E+02 | AC-228 |
| | 14 | 352.20 | 346 - | 357 | 352.41 | 4.62E+02 | 75.71 | 4.85E+02 | PB-214 |
| | 15 | 463.44 | 458 - | 468 | 463.61 | 5.00E+01 | 52.42 | 3.36E+02 | SB-125 |
| | 16 | 511.44 | 507 - | 516 | 511.60 | 1.32E+02 | 53.31 | 3.32E+02 | ..... |
| | 17 | 583.54 | 579 - | 587 | 583.67 | 2.27E+02 | 48.38 | 2.21E+02 | TL-208 |
| | 18 | 609.90 | 606 - | 615 | 610.02 | 2.85E+02 | 55.01 | 2.68E+02 | BI-214 |
| | 19 | 727.61 | 724 - | 731 | 727.69 | 4.07E+01 | 33.94 | 1.67E+02 | BI-212 |
| | 20 | 768.49 | 762 - | 775 | 768.56 | 6.41E+01 | 48.26 | 2.28E+02 | ..... |
| | 21 | 787.00 | 785 - | 790 | 787.06 | 2.52E+01 | 20.86 | 6.36E+01 | ..... |
| | 22 | 794.79 | 791 - | 799 | 794.85 | 4.51E+01 | 27.73 | 9.18E+01 | ..... |
| | 23 | 911.53 | 908 - | 915 | 911.55 | 1.38E+02 | 34.29 | 1.03E+02 | TL-204 |
| | | | | | | | | | AC-228 |
| | 24 | 934.62 | 930 - | 939 | 934.63 | 2.66E+01 | 29.36 | 1.03E+02 | ..... |
| | 25 | 942.86 | 940 - | 946 | 942.86 | 1.74E+01 | 20.99 | 6.92E+01 | ..... |
| M | 26 | 964.45 | 961 - | 973 | 964.45 | 4.21E+01 | 29.05 | 1.16E+02 | EU-152 |
| m | 27 | 969.45 | 961 - | 973 | 969.45 | 6.43E+01 | 28.83 | 9.54E+01 | AC-228 |
| | 28 | 1003.83 | 997 - | 1012 | 1003.82 | 6.33E+01 | 41.18 | 1.45E+02 | EU-154 |
| | 29 | 1120.48 | 1116 - | 1125 | 1120.43 | 4.77E+01 | 39.33 | 1.91E+02 | SC-46 |
| | | | | | | | | | BI-214 |
| | | | | | | | | | TA-182 |
| | 30 | 1200.82 | 1198 - | 1203 | 1200.74 | 2.18E+01 | 21.38 | 7.23E+01 | ..... |
| M | 31 | 1234.86 | 1232 - | 1249 | 1234.77 | 1.68E+01 | 18.40 | 5.76E+01 | CS-136 |
| m | 32 | 1239.34 | 1232 - | 1249 | 1239.25 | 3.33E+01 | 31.73 | 1.16E+02 | ..... |
| | 33 | 1349.19 | 1343 - | 1359 | 1349.06 | 2.56E+01 | 30.04 | 7.47E+01 | ..... |
| | 34 | 1414.51 | 1410 - | 1419 | 1414.36 | 2.30E+01 | 17.26 | 2.81E+01 | ..... |
| | 35 | 1424.30 | 1420 - | 1429 | 1424.14 | 1.30E+01 | 13.86 | 2.00E+01 | ..... |
| | 36 | 1461.04 | 1455 - | 1466 | 1460.88 | 7.13E+02 | 57.31 | 5.38E+01 | K-40 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|
| 37 | 1676.46 | 1673 - | 1679 | 1676.22 | 7.17E+00 | 6.95 | 3.67E+00 | ..... |
| 38 | 1708.56 | 1705 - | 1711 | 1708.31 | 5.00E+00 | 7.52 | 6.00E+00 | ..... |
| 39 | 1753.35 | 1749 - | 1756 | 1753.08 | 7.15E+00 | 10.00 | 1.17E+01 | ..... |
| 40 | 1765.60 | 1759 - | 1774 | 1765.33 | 6.90E+01 | 16.61 | 0.00E+00 | ..... |
| 41 | 1816.13 | 1812 - | 1818 | 1815.85 | 5.21E+00 | 6.34 | 3.57E+00 | ..... |
| 42 | 1886.65 | 1884 - | 1889 | 1886.34 | 5.95E+00 | 8.19 | 8.10E+00 | ..... |
| 43 | 1892.96 | 1890 - | 1896 | 1892.64 | 6.75E+00 | 6.65 | 2.50E+00 | ..... |
| 44 | 1979.12 | 1975 - | 1981 | 1978.78 | 9.00E+00 | 6.00 | 0.00E+00 | ..... |
| 45 | 2204.91 | 2201 - | 2209 | 2204.50 | 1.58E+01 | 12.20 | 1.25E+01 | BI-214 |
| 46 | 2241.31 | 2236 - | 2246 | 2240.88 | 1.70E+01 | 8.25 | 0.00E+00 | ..... |
| 47 | 2419.99 | 2414 - | 2425 | 2419.50 | 1.40E+01 | 7.48 | 0.00E+00 | ..... |
| 48 | 2431.16 | 2426 - | 2434 | 2430.67 | 9.00E+00 | 6.00 | 0.00E+00 | ..... |
| 49 | 2447.28 | 2443 - | 2449 | 2446.78 | 7.92E+00 | 9.42 | 1.02E+01 | ..... |
| 50 | 2614.62 | 2609 - | 2618 | 2614.06 | 7.05E+01 | 17.80 | 4.90E+00 | TL-208 |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 1:15:55PM

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 1 | 47.30 | 1.39E+02 | 111.56 | 1.77E-02 | 1.73E-03 |
| | 2 | 63.70 | 1.58E+02 | 106.48 | 2.45E-02 | 1.80E-03 |
| | 3 | 76.71 | 9.89E+02 | 180.65 | 2.67E-02 | 2.05E-03 |
| | 4 | 93.57 | 2.32E+02 | 112.71 | 2.71E-02 | 2.24E-03 |
| | 5 | 186.68 | 1.40E+02 | 89.53 | 1.95E-02 | 1.55E-03 |
| | 6 | 209.47 | 8.04E+01 | 79.60 | 1.79E-02 | 1.46E-03 |
| M | 7 | 239.11 | 7.92E+02 | 78.20 | 1.61E-02 | 1.34E-03 |
| m | 8 | 242.04 | 1.66E+02 | 79.04 | 1.59E-02 | 1.33E-03 |
| | 9 | 259.89 | 4.12E+01 | 51.38 | 1.50E-02 | 1.26E-03 |
| | 10 | 270.35 | 7.69E+01 | 78.37 | 1.45E-02 | 1.21E-03 |
| | 11 | 295.38 | 1.90E+02 | 77.87 | 1.35E-02 | 1.15E-03 |
| | 12 | 328.55 | 4.81E+01 | 57.43 | 1.23E-02 | 1.08E-03 |
| | 13 | 338.87 | 1.85E+02 | 75.79 | 1.19E-02 | 1.06E-03 |
| | 14 | 352.20 | 4.62E+02 | 75.71 | 1.15E-02 | 1.03E-03 |
| | 15 | 463.44 | 5.00E+01 | 52.42 | 9.01E-03 | 8.57E-04 |
| | 16 | 511.44 | 1.32E+02 | 53.31 | 8.25E-03 | 7.94E-04 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| | 17 | 583.54 | 2.27E+02 | 48.38 | 7.32E-03 | 6.98E-04 |
| | 18 | 609.90 | 2.85E+02 | 55.01 | 7.04E-03 | 6.63E-04 |
| | 19 | 727.61 | 4.07E+01 | 33.94 | 6.01E-03 | 5.36E-04 |
| | 20 | 768.49 | 6.41E+01 | 48.26 | 5.72E-03 | 5.00E-04 |
| | 21 | 787.00 | 2.52E+01 | 20.86 | 5.60E-03 | 4.84E-04 |
| | 22 | 794.79 | 4.51E+01 | 27.73 | 5.55E-03 | 4.77E-04 |
| | 23 | 911.53 | 1.38E+02 | 34.29 | 4.92E-03 | 3.84E-04 |
| | 24 | 934.62 | 2.66E+01 | 29.36 | 4.81E-03 | 3.80E-04 |
| | 25 | 942.86 | 1.74E+01 | 20.99 | 4.78E-03 | 3.79E-04 |
| M | 26 | 964.45 | 4.21E+01 | 29.05 | 4.68E-03 | 3.75E-04 |
| m | 27 | 969.45 | 6.43E+01 | 28.83 | 4.66E-03 | 3.74E-04 |
| | 28 | 1003.83 | 6.33E+01 | 41.18 | 4.52E-03 | 3.69E-04 |
| | 29 | 1120.48 | 4.77E+01 | 39.33 | 4.12E-03 | 3.50E-04 |
| | 30 | 1200.82 | 2.18E+01 | 21.38 | 3.88E-03 | 3.33E-04 |
| M | 31 | 1234.86 | 1.68E+01 | 18.40 | 3.79E-03 | 3.23E-04 |
| m | 32 | 1239.34 | 3.33E+01 | 31.73 | 3.78E-03 | 3.22E-04 |
| | 33 | 1349.19 | 2.56E+01 | 30.04 | 3.53E-03 | 2.93E-04 |
| | 34 | 1414.51 | 2.30E+01 | 17.26 | 3.40E-03 | 2.82E-04 |
| | 35 | 1424.30 | 1.30E+01 | 13.86 | 3.38E-03 | 2.81E-04 |
| | 36 | 1461.04 | 7.13E+02 | 57.31 | 3.31E-03 | 2.75E-04 |
| | 37 | 1676.46 | 7.17E+00 | 6.95 | 2.98E-03 | 2.41E-04 |
| | 38 | 1708.56 | 5.00E+00 | 7.52 | 2.93E-03 | 2.35E-04 |
| | 39 | 1753.35 | 7.15E+00 | 10.00 | 2.88E-03 | 2.28E-04 |
| | 40 | 1765.60 | 6.90E+01 | 16.61 | 2.86E-03 | 2.26E-04 |
| | 41 | 1816.13 | 5.21E+00 | 6.34 | 2.81E-03 | 2.18E-04 |
| | 42 | 1886.65 | 5.95E+00 | 8.19 | 2.73E-03 | 2.15E-04 |
| | 43 | 1892.96 | 6.75E+00 | 6.65 | 2.72E-03 | 2.15E-04 |
| | 44 | 1979.12 | 9.00E+00 | 6.00 | 2.64E-03 | 2.15E-04 |
| | 45 | 2204.91 | 1.58E+01 | 12.20 | 2.46E-03 | 2.15E-04 |
| | 46 | 2241.31 | 1.70E+01 | 8.25 | 2.44E-03 | 2.15E-04 |
| | 47 | 2419.99 | 1.40E+01 | 7.48 | 2.33E-03 | 2.15E-04 |
| | 48 | 2431.16 | 9.00E+00 | 6.00 | 2.33E-03 | 2.15E-04 |
| | 49 | 2447.28 | 7.92E+00 | 9.42 | 2.32E-03 | 2.15E-04 |
| | 50 | 2614.62 | 7.05E+01 | 17.80 | 2.24E-03 | 2.15E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 1:15:55PM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055575.CNF

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 47.30 | 1.39E+02 | 111.56 | 4.47E+01 | 1.09E+01 | 9.45E+01 | 1.12E+02 |
| | 2 | 63.70 | 1.58E+02 | 106.48 | 4.12E+01 | 5.67E+00 | 1.17E+02 | 1.07E+02 |
| | 3 | 76.71 | 9.89E+02 | 180.65 | | | 9.89E+02 | 1.81E+02 |
| | 4 | 93.57 | 2.32E+02 | 112.71 | 7.98E+01 | 7.31E+00 | 1.52E+02 | 1.13E+02 |
| | 5 | 186.68 | 1.40E+02 | 89.53 | 3.06E+01 | 5.82E+00 | 1.09E+02 | 8.97E+01 |
| | 6 | 209.47 | 8.04E+01 | 79.60 | | | 8.04E+01 | 7.96E+01 |
| M | 7 | 239.11 | 7.92E+02 | 78.20 | 1.40E+01 | 2.71E+00 | 7.78E+02 | 7.82E+01 |
| m | 8 | 242.04 | 1.66E+02 | 79.04 | | | 1.66E+02 | 7.90E+01 |
| | 9 | 259.89 | 4.12E+01 | 51.38 | | | 4.12E+01 | 5.14E+01 |
| | 10 | 270.35 | 7.69E+01 | 78.37 | | | 7.69E+01 | 7.84E+01 |
| | 11 | 295.38 | 1.90E+02 | 77.87 | | | 1.90E+02 | 7.79E+01 |
| | 12 | 328.55 | 4.81E+01 | 57.43 | | | 4.81E+01 | 5.74E+01 |
| | 13 | 338.87 | 1.85E+02 | 75.79 | | | 1.85E+02 | 7.58E+01 |
| | 14 | 352.20 | 4.62E+02 | 75.71 | 6.53E+00 | 4.43E+00 | 4.55E+02 | 7.58E+01 |
| | 15 | 463.44 | 5.00E+01 | 52.42 | | | 5.00E+01 | 5.24E+01 |
| | 16 | 511.44 | 1.32E+02 | 53.31 | 5.21E+01 | 4.74E+00 | 8.01E+01 | 5.35E+01 |
| | 17 | 583.54 | 2.27E+02 | 48.38 | | | 2.27E+02 | 4.84E+01 |
| | 18 | 609.90 | 2.85E+02 | 55.01 | 3.25E+00 | 2.97E+00 | 2.82E+02 | 5.51E+01 |
| | 19 | 727.61 | 4.07E+01 | 33.94 | | | 4.07E+01 | 3.39E+01 |
| | 20 | 768.49 | 6.41E+01 | 48.26 | | | 6.41E+01 | 4.83E+01 |
| | 21 | 787.00 | 2.52E+01 | 20.86 | | | 2.52E+01 | 2.09E+01 |
| | 22 | 794.79 | 4.51E+01 | 27.73 | 0.00E+00 | 0.00E+00 | 4.51E+01 | 2.77E+01 |
| | 23 | 911.53 | 1.38E+02 | 34.29 | 2.85E+00 | 2.76E+00 | 1.36E+02 | 3.44E+01 |
| | 24 | 934.62 | 2.66E+01 | 29.36 | | | 2.66E+01 | 2.94E+01 |
| | 25 | 942.86 | 1.74E+01 | 20.99 | | | 1.74E+01 | 2.10E+01 |
| M | 26 | 964.45 | 4.21E+01 | 29.05 | | | 4.21E+01 | 2.91E+01 |
| m | 27 | 969.45 | 6.43E+01 | 28.83 | | | 6.43E+01 | 2.88E+01 |
| | 28 | 1003.83 | 6.33E+01 | 41.18 | | | 6.33E+01 | 4.12E+01 |
| | 29 | 1120.48 | 4.77E+01 | 39.33 | | | 4.77E+01 | 3.93E+01 |
| | 30 | 1200.82 | 2.18E+01 | 21.38 | | | 2.18E+01 | 2.14E+01 |
| M | 31 | 1234.86 | 1.68E+01 | 18.40 | | | 1.68E+01 | 1.84E+01 |
| m | 32 | 1239.34 | 3.33E+01 | 31.73 | | | 3.33E+01 | 3.17E+01 |
| | 33 | 1349.19 | 2.56E+01 | 30.04 | | | 2.56E+01 | 3.00E+01 |
| | 34 | 1414.51 | 2.30E+01 | 17.26 | | | 2.30E+01 | 1.73E+01 |
| | 35 | 1424.30 | 1.30E+01 | 13.86 | | | 1.30E+01 | 1.39E+01 |
| | 36 | 1461.04 | 7.13E+02 | 57.31 | 1.00E+00 | 1.77E+00 | 7.12E+02 | 5.73E+01 |
| | 37 | 1676.46 | 7.17E+00 | 6.95 | | | 7.17E+00 | 6.95E+00 |
| | 38 | 1708.56 | 5.00E+00 | 7.52 | | | 5.00E+00 | 7.52E+00 |
| | 39 | 1753.35 | 7.15E+00 | 10.00 | | | 7.15E+00 | 1.00E+01 |
| | 40 | 1765.60 | 6.90E+01 | 16.61 | | | 6.90E+01 | 1.66E+01 |
| | 41 | 1816.13 | 5.21E+00 | 6.34 | | | 5.21E+00 | 6.34E+00 |
| | 42 | 1886.65 | 5.95E+00 | 8.19 | | | 5.95E+00 | 8.19E+00 |
| | 43 | 1892.96 | 6.75E+00 | 6.65 | | | 6.75E+00 | 6.65E+00 |
| | 44 | 1979.12 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| | 45 | 2204.91 | 1.58E+01 | 12.20 | | | 1.58E+01 | 1.22E+01 |
| | 46 | 2241.31 | 1.70E+01 | 8.25 | | | 1.70E+01 | 8.25E+00 |
| | 47 | 2419.99 | 1.40E+01 | 7.48 | | | 1.40E+01 | 7.48E+00 |
| | 48 | 2431.16 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| | 49 | 2447.28 | 7.92E+00 | 9.42 | | | 7.92E+00 | 9.42E+00 |
| | 50 | 2614.62 | 7.05E+01 | 17.80 | 1.86E+00 | 1.12E+00 | 6.87E+01 | 1.78E+01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

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

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 1:15:55PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055575.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| | 1 | 47.30 | 1.39E+02 | 111.56 | 4.47E+01 | 1.09E+01 | 9.45E+01 | 1.12E+02 |
| | 2 | 63.70 | 1.58E+02 | 106.48 | 4.12E+01 | 5.67E+00 | 1.17E+02 | 1.07E+02 |
| | 3 | 76.71 | 9.89E+02 | 180.65 | | | 9.89E+02 | 1.81E+02 |
| | 4 | 93.57 | 2.32E+02 | 112.71 | 7.98E+01 | 7.31E+00 | 1.52E+02 | 1.13E+02 |
| | 5 | 186.68 | 1.40E+02 | 89.53 | 3.06E+01 | 5.82E+00 | 1.09E+02 | 8.97E+01 |
| | 6 | 209.47 | 8.04E+01 | 79.60 | | | 8.04E+01 | 7.96E+01 |
| M | 7 | 239.11 | 7.92E+02 | 78.20 | 1.40E+01 | 2.71E+00 | 7.78E+02 | 7.82E+01 |
| m | 8 | 242.04 | 1.66E+02 | 79.04 | | | 1.66E+02 | 7.90E+01 |
| | 9 | 259.89 | 4.12E+01 | 51.38 | | | 4.12E+01 | 5.14E+01 |
| | 10 | 270.35 | 7.69E+01 | 78.37 | | | 7.69E+01 | 7.84E+01 |
| | 11 | 295.38 | 1.90E+02 | 77.87 | | | 1.90E+02 | 7.79E+01 |
| | 12 | 328.55 | 4.81E+01 | 57.43 | | | 4.81E+01 | 5.74E+01 |
| | 13 | 338.87 | 1.85E+02 | 75.79 | | | 1.85E+02 | 7.58E+01 |
| | 14 | 352.20 | 4.62E+02 | 75.71 | 6.53E+00 | 4.43E+00 | 4.55E+02 | 7.58E+01 |
| | 15 | 463.44 | 5.00E+01 | 52.42 | | | 5.00E+01 | 5.24E+01 |
| | 16 | 511.44 | 1.32E+02 | 53.31 | 5.21E+01 | 4.74E+00 | 8.01E+01 | 5.35E+01 |
| | 17 | 583.54 | 2.27E+02 | 48.38 | | | 2.27E+02 | 4.84E+01 |
| | 18 | 609.90 | 2.85E+02 | 55.01 | 3.25E+00 | 2.97E+00 | 2.82E+02 | 5.51E+01 |
| | 19 | 727.61 | 4.07E+01 | 33.94 | | | 4.07E+01 | 3.39E+01 |
| | 20 | 768.49 | 6.41E+01 | 48.26 | | | 6.41E+01 | 4.83E+01 |
| | 21 | 787.00 | 2.52E+01 | 20.86 | | | 2.52E+01 | 2.09E+01 |
| | 22 | 794.79 | 4.51E+01 | 27.73 | 0.00E+00 | 0.00E+00 | 4.51E+01 | 2.77E+01 |
| | 23 | 911.53 | 1.38E+02 | 34.29 | 2.85E+00 | 2.76E+00 | 1.36E+02 | 3.44E+01 |
| | 24 | 934.62 | 2.66E+01 | 29.36 | | | 2.66E+01 | 2.94E+01 |
| | 25 | 942.86 | 1.74E+01 | 20.99 | | | 1.74E+01 | 2.10E+01 |
| M | 26 | 964.45 | 4.21E+01 | 29.05 | | | 4.21E+01 | 2.91E+01 |
| m | 27 | 969.45 | 6.43E+01 | 28.83 | | | 6.43E+01 | 2.88E+01 |
| | 28 | 1003.83 | 6.33E+01 | 41.18 | | | 6.33E+01 | 4.12E+01 |
| | 29 | 1120.48 | 4.77E+01 | 39.33 | | | 4.77E+01 | 3.93E+01 |
| | 30 | 1200.82 | 2.18E+01 | 21.38 | | | 2.18E+01 | 2.14E+01 |
| M | 31 | 1234.86 | 1.68E+01 | 18.40 | | | 1.68E+01 | 1.84E+01 |
| m | 32 | 1239.34 | 3.33E+01 | 31.73 | | | 3.33E+01 | 3.17E+01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 33 | 1349.19 | 2.56E+01 | 30.04 | | | 2.56E+01 | 3.00E+01 |
| 34 | 1414.51 | 2.30E+01 | 17.26 | | | 2.30E+01 | 1.73E+01 |
| 35 | 1424.30 | 1.30E+01 | 13.86 | | | 1.30E+01 | 1.39E+01 |
| 36 | 1461.04 | 7.13E+02 | 57.31 | 1.00E+00 | 1.77E+00 | 7.12E+02 | 5.73E+01 |
| 37 | 1676.46 | 7.17E+00 | 6.95 | | | 7.17E+00 | 6.95E+00 |
| 38 | 1708.56 | 5.00E+00 | 7.52 | | | 5.00E+00 | 7.52E+00 |
| 39 | 1753.35 | 7.15E+00 | 10.00 | | | 7.15E+00 | 1.00E+01 |
| 40 | 1765.60 | 6.90E+01 | 16.61 | | | 6.90E+01 | 1.66E+01 |
| 41 | 1816.13 | 5.21E+00 | 6.34 | | | 5.21E+00 | 6.34E+00 |
| 42 | 1886.65 | 5.95E+00 | 8.19 | | | 5.95E+00 | 8.19E+00 |
| 43 | 1892.96 | 6.75E+00 | 6.65 | | | 6.75E+00 | 6.65E+00 |
| 44 | 1979.12 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| 45 | 2204.91 | 1.58E+01 | 12.20 | | | 1.58E+01 | 1.22E+01 |
| 46 | 2241.31 | 1.70E+01 | 8.25 | | | 1.70E+01 | 8.25E+00 |
| 47 | 2419.99 | 1.40E+01 | 7.48 | | | 1.40E+01 | 7.48E+00 |
| 48 | 2431.16 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| 49 | 2447.28 | 7.92E+00 | 9.42 | | | 7.92E+00 | 9.42E+00 |
| 50 | 2614.62 | 7.05E+01 | 17.80 | 1.86E+00 | 1.12E+00 | 6.87E+01 | 1.78E+01 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.991 | 1460.81 | * | 10.67 | 2.14E+01 | 2.51E+00 |
| TL-208 | 0.877 | 583.14 | * | 30.22 | 1.09E+00 | 2.54E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 9.08E-01 | 2.51E-01 |
| PB-210 | 0.902 | 46.50 | * | 4.25 | 1.34E+00 | 1.60E+00 |
| BI-212 | 0.747 | 727.17 | * | 11.80 | 6.09E-01 | 5.11E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.863 | 238.63 | * | 44.60 | 1.15E+00 | 1.50E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.736 | 609.31 | * | 46.30 | 9.17E-01 | 1.99E-01 |
| | | 1120.29 | * | 15.10 | 8.14E-01 | 6.75E-01 |
| | | 1764.49 | | 15.80 | | |
| | | 2204.22 | * | 4.98 | 1.36E+00 | 1.06E+00 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| PB-214 | 0.990 | 295.21 | * | 19.19 | 7.82E-01 | 3.27E-01 |
| | | 351.92 | * | 37.19 | 1.13E+00 | 2.13E-01 |
| RA-226 | 0.965 | 186.21 | * | 3.28 | 1.80E+00 | 3.62E+00 |
| AC-228 | 0.968 | 338.32 | * | 11.40 | 1.44E+00 | 6.05E-01 |
| | | 911.07 | * | 27.70 | 1.06E+00 | 2.80E-01 |
| | | 969.11 | * | 16.60 | 8.81E-01 | 4.01E-01 |
| TH-234 | 0.974 | 63.29 | * | 3.80 | 1.33E+00 | 1.22E+00 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 1:15:55PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 3 | 76.71 | 2.74719E-01 | 9.13 | | |
| | 4 | 93.57 | 4.21400E-02 | 37.23 | | |
| | 6 | 209.47 | 2.23275E-02 | 49.51 | Tol. | CM-243 |
| m | 8 | 242.04 | 4.62452E-02 | 23.74 | | |
| | 9 | 259.89 | 1.14403E-02 | 62.38 | | |
| | 10 | 270.35 | 2.13738E-02 | 50.92 | | |
| | 12 | 328.55 | 1.33710E-02 | 59.66 | Tol. | LA-140 |
| | 15 | 463.44 | 1.38825E-02 | 52.44 | Tol. | SB-125 |
| | 16 | 511.44 | 2.22468E-02 | 33.41 | | |
| | 20 | 768.49 | 1.77942E-02 | 37.67 | | |
| | 21 | 787.00 | 7.00049E-03 | 41.38 | | |
| | 22 | 794.79 | 1.25305E-02 | 30.74 | | |
| | 24 | 934.62 | 7.40028E-03 | 55.10 | | |
| | 25 | 942.86 | 4.83440E-03 | 60.31 | | |
| M | 26 | 964.45 | 1.17029E-02 | 34.48 | Tol. | EU-152 |
| | 28 | 1003.83 | 1.75919E-02 | 32.51 | Tol. | EU-154 |
| | 30 | 1200.82 | 6.06561E-03 | 48.95 | | |
| M | 31 | 1234.86 | 4.67156E-03 | 54.70 | Tol. | CS-136 |
| m | 32 | 1239.34 | 9.25196E-03 | 47.63 | | |
| | 33 | 1349.19 | 7.12081E-03 | 58.59 | | |
| | 34 | 1414.51 | 6.38138E-03 | 37.57 | | |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 35 | 1424.30 | 3.61111E-03 | 53.29 | | |
| 37 | 1676.46 | 1.99074E-03 | 48.46 | | |
| 38 | 1708.56 | 1.38889E-03 | 75.17 | | |
| 39 | 1753.35 | 1.98718E-03 | 69.89 | | |
| 40 | 1765.60 | 1.91667E-02 | 12.04 | | |
| 41 | 1816.13 | 1.44841E-03 | 60.84 | | |
| 42 | 1886.65 | 1.65278E-03 | 68.78 | | |
| 43 | 1892.96 | 1.87500E-03 | 49.27 | | |
| 44 | 1979.12 | 2.50000E-03 | 33.33 | | |
| 46 | 2241.31 | 4.72222E-03 | 24.25 | Sum | |
| 47 | 2419.99 | 3.88889E-03 | 26.73 | | |
| 48 | 2431.16 | 2.50000E-03 | 33.33 | Sum | |
| 49 | 2447.28 | 2.20085E-03 | 59.45 | | |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.99 | 1460.81 | * | 10.67 | 2.14E+01 | 2.51E+00 |
| TL-208 | 0.87 | 583.14 | * | 30.22 | 1.09E+00 | 2.54E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 9.08E-01 | 2.51E-01 |
| PB-210 | 0.90 | 46.50 | * | 4.25 | 1.34E+00 | 1.60E+00 |
| BI-212 | 0.74 | 727.17 | * | 11.80 | 6.09E-01 | 5.11E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.86 | 238.63 | * | 44.60 | 1.15E+00 | 1.50E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.73 | 609.31 | * | 46.30 | 9.17E-01 | 1.99E-01 |
| | | 1120.29 | * | 15.10 | 8.14E-01 | 6.75E-01 |
| | | 1764.49 | | 15.80 | | |
| | | 2204.22 | * | 4.98 | 1.36E+00 | 1.06E+00 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 7.82E-01 | 3.27E-01 |
| | | 351.92 | * | 37.19 | 1.13E+00 | 2.13E-01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| RA-226 | 0.96 | 186.21 | * | 3.28 | 1.80E+00 | 3.62E+00 |
| AC-228 | 0.96 | 338.32 | * | 11.40 | 1.44E+00 | 6.05E-01 |
| | | 911.07 | * | 27.70 | 1.06E+00 | 2.80E-01 |
| | | 969.11 | * | 16.60 | 8.81E-01 | 4.01E-01 |
| TH-234 | 0.97 | 63.29 | * | 3.80 | 1.33E+00 | 1.22E+00 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| K-40 | 0.991 | 2.14E+01 | 2.51E+00 | |
| TL-208 | 0.877 | 9.96E-01 | 1.79E-01 | |
| PB-210 | 0.902 | 1.34E+00 | 1.60E+00 | |
| BI-212 | 0.747 | 6.09E-01 | 5.11E-01 | |
| PB-212 | 0.863 | 1.15E+00 | 1.50E-01 | |
| BI-214 | 0.736 | 9.23E-01 | 1.88E-01 | |
| PB-214 | 0.990 | 1.02E+00 | 1.78E-01 | |
| RA-226 | 0.965 | 1.80E+00 | 3.62E+00 | |
| AC-228 | 0.968 | 1.05E+00 | 2.15E-01 | |
| TH-234 | 0.974 | 1.33E+00 | 1.22E+00 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 1:15:55PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 3 | 76.71 | 2.74719E-01 | 9.13 | | |
| | 4 | 93.57 | 4.21400E-02 | 37.23 | | |
| | 6 | 209.47 | 2.23275E-02 | 49.51 | Tol. | CM-243 |
| m | 8 | 242.04 | 4.62452E-02 | 23.74 | | |
| | 9 | 259.89 | 1.14403E-02 | 62.38 | | |
| | 10 | 270.35 | 2.13738E-02 | 50.92 | | |
| | 12 | 328.55 | 1.33710E-02 | 59.66 | Tol. | LA-140 |
| | 15 | 463.44 | 1.38825E-02 | 52.44 | Tol. | SB-125 |
| | 16 | 511.44 | 2.22468E-02 | 33.41 | | |
| | 20 | 768.49 | 1.77942E-02 | 37.67 | | |
| | 21 | 787.00 | 7.00049E-03 | 41.38 | | |
| | 22 | 794.79 | 1.25305E-02 | 30.74 | | |
| | 24 | 934.62 | 7.40028E-03 | 55.10 | | |
| | 25 | 942.86 | 4.83440E-03 | 60.31 | | |
| M | 26 | 964.45 | 1.17029E-02 | 34.48 | Tol. | EU-152 |
| | 28 | 1003.83 | 1.75919E-02 | 32.51 | Tol. | EU-154 |
| | 30 | 1200.82 | 6.06561E-03 | 48.95 | | |
| M | 31 | 1234.86 | 4.67156E-03 | 54.70 | Tol. | CS-136 |
| m | 32 | 1239.34 | 9.25196E-03 | 47.63 | | |
| | 33 | 1349.19 | 7.12081E-03 | 58.59 | | |
| | 34 | 1414.51 | 6.38138E-03 | 37.57 | | |
| | 35 | 1424.30 | 3.61111E-03 | 53.29 | | |
| | 37 | 1676.46 | 1.99074E-03 | 48.46 | | |
| | 38 | 1708.56 | 1.38889E-03 | 75.17 | | |
| | 39 | 1753.35 | 1.98718E-03 | 69.89 | | |
| | 40 | 1765.60 | 1.91667E-02 | 12.04 | | |
| | 41 | 1816.13 | 1.44841E-03 | 60.84 | | |
| | 42 | 1886.65 | 1.65278E-03 | 68.78 | | |
| | 43 | 1892.96 | 1.87500E-03 | 49.27 | | |
| | 44 | 1979.12 | 2.50000E-03 | 33.33 | | |
| | 46 | 2241.31 | 4.72222E-03 | 24.25 | Sum | |
| | 47 | 2419.99 | 3.88889E-03 | 26.73 | | |
| | 48 | 2431.16 | 2.50000E-03 | 33.33 | Sum | |
| | 49 | 2447.28 | 2.20085E-03 | 59.45 | | |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | -4.21E-02 | 2.24E+00 | 2.24E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | 1.63E-02 | 1.12E-01 | 1.12E-01 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | 1.13E-02 | 5.99E-02 | 5.99E-02 |
| + | | K-40 | 1460.81 | * | 10.67 | 2.14E+01 | 1.12E+00 | 1.12E+00 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | -3.69E-03 | 5.60E-02 | 5.60E-02 |
| | | | 78.34 | | 96.00 | 1.85E-01 | | 7.27E-02 |
| + | | SC-46 | 889.25 | | 99.98 | -8.91E-02 | 1.77E-01 | 1.77E-01 |
| | | | 1120.51 | | 99.99 | 3.08E-01 | | 3.12E-01 |
| + | | V-48 | 983.52 | | 99.98 | -2.61E+00 | 5.75E+00 | 5.75E+00 |
| | | | 1312.10 | | 97.50 | -1.61E+00 | | 6.23E+00 |
| + | | CR-51 | 320.08 | | 9.83 | 7.99E-01 | 6.99E+00 | 6.99E+00 |
| + | | MN-54 | 834.83 | | 99.97 | 5.50E-02 | 1.01E-01 | 1.01E-01 |
| + | | CO-56 | 846.75 | | 99.96 | -3.42E-02 | 1.85E-01 | 1.85E-01 |
| | | | 1037.75 | | 14.03 | 2.83E-01 | | 1.48E+00 |
| | | | 1238.25 | | 67.00 | 3.33E-01 | | 4.93E-01 |
| | | | 1771.40 | | 15.51 | -3.12E+00 | | 1.08E+00 |
| | | | 2598.48 | | 16.90 | 2.68E-01 | | 8.04E-01 |
| + | | CO-57 | 122.06 | | 85.51 | -3.31E-02 | 6.25E-02 | 6.25E-02 |
| | | | 136.48 | | 10.60 | -1.07E-02 | | 5.30E-01 |
| + | | CO-58 | 810.76 | | 99.40 | 8.13E-02 | 2.09E-01 | 2.09E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | 3.46E-01 | 8.12E-01 | 8.12E-01 |
| | | | 1291.56 | | 43.20 | 8.70E-02 | | 1.05E+00 |
| + | | CO-60 | 1173.22 | | 100.00 | -3.53E-03 | 8.56E-02 | 1.03E-01 |
| | | | 1332.49 | | 100.00 | -1.67E-02 | | 8.56E-02 |
| + | | ZN-65 | 1115.52 | | 50.75 | 2.01E-02 | 2.66E-01 | 2.66E-01 |
| + | | GA-67 | 93.31 | | 35.70 | 4.86E+08 | 2.27E+08 | 2.27E+08 |
| | | | 208.95 | | 2.24 | 3.85E+09 | | 3.91E+09 |
| | | | 300.22 | | 16.00 | 2.23E+08 | | 6.24E+08 |
| + | | SE-75 | 121.11 | | 16.70 | -5.75E-02 | 1.31E-01 | 4.49E-01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | SE-75 | 136.00 | 59.20 | -1.60E-03 | 1.31E-01 | 1.31E-01 |
| | | 264.65 | 59.80 | 1.43E-02 | | 1.57E-01 |
| | | 279.53 | 25.20 | 4.87E-02 | | 4.15E-01 |
| | | 400.65 | 11.40 | 7.38E-02 | | 9.16E-01 |
| + | RB-82 | 776.52 | 13.00 | -2.08E-01 | 8.25E+00 | 8.25E+00 |
| + | RB-83 | 520.41 | 46.00 | -8.19E-02 | 3.06E-01 | 3.06E-01 |
| | | 529.64 | 30.30 | -4.02E-01 | | 4.56E-01 |
| | | 552.65 | 16.40 | 7.30E-01 | | 9.37E-01 |
| + | KR-85 | 513.99 | 0.43 | 2.81E+01 | 2.22E+01 | 2.22E+01 |
| + | SR-85 | 513.99 | 99.27 | 3.49E-01 | 2.76E-01 | 2.76E-01 |
| + | Y-88 | 898.02 | 93.40 | -1.23E-01 | 1.33E-01 | 1.58E-01 |
| | | 1836.01 | 99.38 | 1.40E-02 | | 1.33E-01 |
| + | MO-93 | 263.06 | 56.72 | 8.59E-03 | 7.27E-02 | 9.70E-02 |
| | | 684.67 | 99.68 | 7.74E-03 | | 7.34E-02 |
| | | 1477.11 | 99.08 | -6.83E-04 | | 7.27E-02 |
| + | NB-93M | 16.57 | 9.43 | 1.90E+01 | 6.40E+01 | 6.40E+01 |
| + | NB-94 | 702.63 | 100.00 | -2.21E-02 | 7.17E-02 | 7.93E-02 |
| | | 871.10 | 100.00 | -1.30E-02 | | 7.17E-02 |
| + | NB-95 | 765.79 | 99.81 | 4.64E-01 | 6.70E-01 | 6.70E-01 |
| + | NB-95M | 235.69 | 25.00 | 6.42E+06 | 6.68E+07 | 6.68E+07 |
| + | ZR-95 | 724.18 | 43.70 | -2.74E-02 | 4.47E-01 | 5.16E-01 |
| | | 756.72 | 55.30 | 2.26E-01 | | 4.47E-01 |
| + | MO-99 | 181.06 | 6.20 | 7.16E+09 | 4.41E+10 | 5.44E+10 |
| | | 739.58 | 12.80 | 1.01E+10 | | 4.41E+10 |
| | | 778.00 | 4.50 | 8.31E+09 | | 1.17E+11 |
| + | RU-103 | 497.08 | 89.00 | 6.59E-02 | 4.24E-01 | 4.24E-01 |
| + | RU-106 | 621.84 | 9.80 | 1.94E-01 | 8.51E-01 | 8.51E-01 |
| + | AG-108M | 433.93 | 89.90 | 2.01E-02 | 6.73E-02 | 6.73E-02 |
| | | 614.37 | 90.40 | -9.33E-03 | | 1.03E-01 |
| | | 722.95 | 90.50 | -8.47E-04 | | 8.14E-02 |
| + | CD-109 | 88.03 | 3.72 | 1.54E+00 | 1.70E+00 | 1.70E+00 |
| + | AG-110M | 657.75 | 93.14 | -1.41E-02 | 1.09E-01 | 1.09E-01 |
| | | 677.61 | 10.53 | -1.24E-01 | | 8.28E-01 |
| | | 706.67 | 16.46 | -1.90E-01 | | 6.24E-01 |
| | | 763.93 | 21.98 | -3.36E-01 | | 4.98E-01 |
| | | 884.67 | 71.63 | 7.55E-02 | | 1.50E-01 |
| | | 1384.27 | 23.94 | 4.00E-02 | | 4.23E-01 |
| + | CD-113M | 263.70 | 0.02 | 2.12E+01 | 2.38E+02 | 2.38E+02 |
| + | SN-113 | 255.12 | 1.93 | 1.21E+00 | 1.88E-01 | 5.16E+00 |
| | | 391.69 | 64.90 | 1.66E-01 | | 1.88E-01 |
| + | TE123M | 159.00 | 84.10 | -5.18E-02 | 9.26E-02 | 9.26E-02 |
| + | SB-124 | 602.71 | 97.87 | 4.22E-02 | 2.30E-01 | 2.30E-01 |
| | | 645.85 | 7.26 | -9.21E-01 | | 3.09E+00 |
| | | 722.78 | 11.10 | -2.16E-02 | | 2.08E+00 |
| | | 1691.02 | 49.00 | -2.76E-01 | | 3.24E-01 |
| + | I-125 | 35.49 | 6.49 | -8.55E-01 | 5.53E+00 | 5.53E+00 |
| + | SB-125 | 176.33 | 6.89 | 2.58E-01 | 2.12E-01 | 7.27E-01 |
| | | 427.89 | 29.33 | -8.31E-02 | | 2.12E-01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | SB-125 | 463.38 | 10.35 | 8.67E-01 | 2.12E-01 | 7.60E-01 |
| | | 600.56 | 17.80 | -4.31E-02 | | 4.38E-01 |
| | | 635.90 | 11.32 | -2.69E-01 | | 6.52E-01 |
| + | SB-126 | 414.70 | 83.30 | -6.23E-01 | 1.96E+01 | 2.04E+01 |
| | | 666.33 | 99.60 | -3.00E+00 | | 2.00E+01 |
| | | 695.00 | 99.60 | -4.28E+00 | | 1.96E+01 |
| | | 720.50 | 53.80 | -8.88E+00 | | 3.44E+01 |
| + | SN-126 | 87.57 | 37.00 | 1.33E-01 | 1.47E-01 | 1.47E-01 |
| + | SB-127 | 473.00 | 25.00 | 3.70E+06 | 1.17E+07 | 1.42E+07 |
| | | 685.20 | 35.70 | 1.23E+06 | | 1.17E+07 |
| | | 783.80 | 14.70 | -3.06E+06 | | 3.14E+07 |
| + | I-129 | 29.78 | 57.00 | 2.10E-01 | 3.61E-01 | 3.61E-01 |
| | | 33.60 | 13.20 | -1.06E-01 | | 1.02E+00 |
| | | 39.58 | 7.52 | 8.75E-01 | | 1.21E+00 |
| + | I-131 | 284.30 | 6.05 | -3.54E+02 | 4.03E+02 | 4.87E+03 |
| | | 364.48 | 81.20 | 2.89E+02 | | 4.03E+02 |
| | | 636.97 | 7.26 | -3.27E+03 | | 4.78E+03 |
| | | 722.89 | 1.80 | -2.22E+02 | | 2.13E+04 |
| + | TE-132 | 49.72 | 13.10 | -4.89E+08 | 1.03E+08 | 7.40E+08 |
| | | 228.16 | 88.00 | 2.52E+07 | | 1.03E+08 |
| + | BA-133 | 81.00 | 33.00 | -4.39E-01 | 1.51E-01 | 1.63E-01 |
| | | 302.84 | 17.80 | 9.12E-02 | | 3.55E-01 |
| | | 356.01 | 60.00 | -1.23E-02 | | 1.51E-01 |
| + | @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | 38.00 | -1.88E+05 | 6.96E+04 | 6.96E+04 |
| + | CS-134 | 563.23 | 8.38 | 2.22E-01 | 8.69E-02 | 8.99E-01 |
| | | 569.32 | 15.43 | -2.51E-01 | | 4.41E-01 |
| | | 604.70 | 97.60 | 2.99E-02 | | 8.69E-02 |
| | | 795.84 | 85.40 | 9.63E-02 | | 1.09E-01 |
| | | 801.93 | 8.73 | -1.02E-01 | | 9.14E-01 |
| + | CS-135 | 268.24 | 16.00 | -7.21E-02 | 3.66E-01 | 3.66E-01 |
| + | @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | 7.46 | 4.68E+01 | 1.25E+01 | 1.19E+02 |
| | | 163.89 | 4.61 | -1.70E+01 | | 1.82E+02 |
| | | 176.55 | 13.56 | 2.28E+01 | | 6.45E+01 |
| | | 273.65 | 12.66 | -3.81E+00 | | 9.28E+01 |
| | | 340.57 | 48.50 | 5.46E+01 | | 2.91E+01 |
| | | 818.50 | 99.70 | -6.02E+00 | | 1.25E+01 |
| | | 1048.07 | 79.60 | -6.60E+00 | | 2.01E+01 |
| | | 1235.34 | 19.70 | -3.55E+01 | | 1.15E+02 |
| + | CS-137 | 661.65 | 85.12 | -2.04E-02 | 9.57E-02 | 9.57E-02 |
| + | LA-138 | 788.74 | 34.00 | -7.19E-02 | 1.20E-01 | 2.23E-01 |
| | | 1435.80 | 66.00 | 4.18E-02 | | 1.20E-01 |
| + | CE-139 | 165.85 | 80.35 | 3.57E-02 | 9.52E-02 | 9.52E-02 |
| + | BA-140 | 162.64 | 6.70 | 3.47E+01 | 6.30E+01 | 1.47E+02 |
| | | 304.84 | 4.50 | -8.04E+01 | | 2.81E+02 |
| | | 423.70 | 3.20 | 1.24E+02 | | 4.28E+02 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | BA-140 | 437.55 | 2.00 | -1.75E+01 | 6.30E+01 | 6.67E+02 |
| | | 537.32 | 25.00 | 3.34E+01 | | 6.30E+01 |
| + | LA-140 | 328.77 | 20.50 | 5.40E+01 | 2.06E+01 | 6.94E+01 |
| | | 487.03 | 45.50 | -5.87E-01 | | 2.97E+01 |
| | | 815.85 | 23.50 | 1.41E+01 | | 6.61E+01 |
| | | 1596.49 | 95.49 | -5.41E+00 | | 2.06E+01 |
| + | CE-141 | 145.44 | 48.40 | 4.86E-01 | 8.14E-01 | 8.14E-01 |
| + | @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | CE-144 | 133.54 | 10.80 | -4.68E-02 | 5.16E-01 | 5.16E-01 |
| + | PM-144 | 476.78 | 42.00 | 4.19E-02 | 8.71E-02 | 1.89E-01 |
| | | 618.01 | 98.60 | -1.08E-02 | | 8.71E-02 |
| | | 696.49 | 99.49 | -3.56E-02 | | 9.04E-02 |
| + | PM-145 | 36.85 | 21.70 | 1.59E-01 | 2.63E-01 | 4.93E-01 |
| | | 37.36 | 39.70 | -2.86E-02 | | 2.63E-01 |
| | | 42.30 | 15.10 | 1.13E-02 | | 5.14E-01 |
| | | 72.40 | 2.31 | 1.82E-01 | | 2.58E+00 |
| + | PM-146 | 453.90 | 39.94 | -2.70E-03 | 1.55E-01 | 1.55E-01 |
| | | 735.90 | 14.01 | 9.65E-02 | | 5.77E-01 |
| | | 747.13 | 13.10 | -1.21E-01 | | 5.74E-01 |
| + | ND-147 | 91.11 | 28.90 | -4.49E+01 | 9.86E+01 | 9.86E+01 |
| | | 531.02 | 13.10 | -2.69E+02 | | 2.52E+02 |
| + | PM-149 | 285.90 | 3.10 | 2.13E+13 | 6.01E+13 | 6.01E+13 |
| + | EU-152 | 121.78 | 20.50 | -1.09E-01 | 2.05E-01 | 2.05E-01 |
| | | 244.69 | 5.40 | 1.39E-01 | | 1.28E+00 |
| | | 344.27 | 19.13 | -5.21E-01 | | 3.08E-01 |
| | | 778.89 | 9.20 | -9.66E-03 | | 8.08E-01 |
| | | 964.01 | 10.40 | -3.78E-01 | | 1.00E+00 |
| | | 1085.78 | 7.22 | 2.86E-01 | | 1.32E+00 |
| | | 1112.02 | 9.60 | 2.16E-01 | | 1.09E+00 |
| | | 1407.95 | 14.94 | 6.07E-02 | | 5.18E-01 |
| + | GD-153 | 97.43 | 31.30 | -3.71E-01 | 1.77E-01 | 1.77E-01 |
| | | 103.18 | 22.20 | -1.99E-01 | | 2.39E-01 |
| + | EU-154 | 123.07 | 40.50 | -3.99E-02 | 1.05E-01 | 1.05E-01 |
| | | 723.30 | 19.70 | -3.97E-03 | | 3.82E-01 |
| | | 873.19 | 11.50 | -3.96E-01 | | 6.19E-01 |
| | | 996.32 | 10.30 | -4.62E-02 | | 8.23E-01 |
| | | 1004.76 | 17.90 | 2.20E-01 | | 5.46E-01 |
| | | 1274.45 | 35.50 | 4.35E-02 | | 2.99E-01 |
| + | EU-155 | 86.50 | 30.90 | 2.02E-01 | 1.84E-01 | 1.84E-01 |
| | | 105.30 | 20.70 | 2.52E-02 | | 2.11E-01 |
| + | EU-156 | 811.77 | 10.40 | 1.40E+01 | 6.63E+01 | 6.63E+01 |
| | | 1153.47 | 7.20 | 1.88E+01 | | 1.33E+02 |
| | | 1230.71 | 8.90 | 2.07E+01 | | 1.14E+02 |
| + | HO-166M | 184.41 | 72.60 | 4.27E-02 | 7.34E-02 | 7.34E-02 |
| | | 280.45 | 29.60 | 5.80E-02 | | 1.96E-01 |
| | | 410.94 | 11.10 | 3.33E-01 | | 6.37E-01 |
| | | 711.69 | 54.10 | -1.62E-02 | | 1.46E-01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | TM-171 | 66.72 | | 0.14 | -4.47E+00 | 4.31E+01 | 4.31E+01 |
| + | HF-172 | 67.35 | | 5.31 | -7.27E-02 | 4.07E-01 | 1.10E+00 |
| | | 125.81 | | 11.30 | -3.34E-01 | | 4.07E-01 |
| + | LU-172 | 181.53 | | 20.60 | 4.15E+02 | 4.34E+03 | 6.29E+03 |
| | | 900.72 | | 29.81 | 2.68E+02 | | 7.95E+03 |
| | | 1093.66 | | 62.50 | 1.28E+03 | | 4.34E+03 |
| + | LU-173 | 100.72 | | 5.24 | 1.72E-01 | 3.46E-01 | 8.95E-01 |
| | | 272.11 | | 21.20 | 1.81E-01 | | 3.46E-01 |
| + | HF-175 | 343.40 | | 84.00 | -3.12E-01 | 1.84E-01 | 1.84E-01 |
| + | LU-176 | 88.34 | | 13.30 | 8.52E-02 | 5.45E-02 | 4.13E-01 |
| | | 201.83 | | 86.00 | 4.83E-03 | | 5.45E-02 |
| | | 306.78 | | 94.00 | -1.18E-02 | | 5.95E-02 |
| + | HF-181 | 133.02 | | 41.70 | -3.48E-03 | 3.91E-01 | 5.37E-01 |
| | | 345.85 | | 17.20 | -3.28E+00 | | 1.65E+00 |
| | | 482.03 | | 82.80 | -7.35E-02 | | 3.91E-01 |
| + | TA-182 | 67.75 | | 41.20 | -1.54E-02 | 2.34E-01 | 2.34E-01 |
| | | 1121.30 | | 34.90 | 8.31E-01 | | 7.20E-01 |
| | | 1189.05 | | 16.23 | -7.05E-01 | | 1.22E+00 |
| | | 1221.41 | | 26.98 | 4.46E-01 | | 8.01E-01 |
| | | 1231.02 | | 11.44 | 3.17E-01 | | 1.74E+00 |
| + | IR-192 | 308.46 | | 29.68 | 1.83E-01 | 3.18E-01 | 4.76E-01 |
| | | 468.07 | | 48.10 | 5.92E-02 | | 3.18E-01 |
| + | HG-203 | 279.19 | | 77.30 | 3.64E-02 | 3.35E-01 | 3.35E-01 |
| + | TL-204 | 374.74 | | 94.11 | -1.83E-02 | 6.48E-02 | 6.48E-02 |
| | | 899.15 | | 99.16 | -2.52E-02 | | 8.54E-02 |
| | | 911.74 | | 91.10 | 3.21E-01 | | 1.65E-01 |
| + | BI-207 | 569.67 | | 97.72 | -7.21E-03 | 6.39E-02 | 6.39E-02 |
| | | 1063.62 | | 74.90 | 5.41E-02 | | 1.17E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 1.09E+00 | 1.79E-01 | 3.11E-01 |
| | | 860.37 | | 4.48 | 1.28E+00 | | 2.04E+00 |
| | | 2614.66 | * | 35.85 | 9.08E-01 | | 1.79E-01 |
| + | BI-210M | 262.00 | | 45.00 | 1.06E-02 | 1.23E-01 | 1.23E-01 |
| | | 300.00 | | 23.00 | 1.06E-01 | | 2.97E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 1.34E+00 | 2.62E+00 | 2.62E+00 |
| + | PB-211 | 404.84 | | 2.90 | -3.55E-01 | 2.17E+00 | 2.17E+00 |
| | | 831.96 | | 2.90 | -1.36E+00 | | 2.46E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 6.09E-01 | 8.15E-01 | 8.15E-01 |
| | | 1620.62 | | 2.75 | -1.20E+00 | | 2.46E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.15E+00 | 2.38E-01 | 2.38E-01 |
| | | 300.09 | | 3.41 | 7.15E-01 | | 2.00E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 9.17E-01 | 2.43E-01 | 2.43E-01 |
| | | 1120.29 | * | 15.10 | 8.14E-01 | | 1.08E+00 |
| | | 1764.49 | | 15.80 | 1.25E+00 | | 9.08E-01 |
| | | 2204.22 | * | 4.98 | 1.36E+00 | | 1.55E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 7.82E-01 | 2.62E-01 | 5.03E-01 |
| | | 351.92 | * | 37.19 | 1.13E+00 | | 2.62E-01 |
| + | RN-219 | 401.80 | | 6.50 | -8.85E-02 | 9.07E-01 | 9.07E-01 |
| + | RA-223 | 323.87 | | 3.88 | 4.10E-01 | 1.51E+00 | 1.51E+00 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | RA-224 | 240.98 | | 3.95 | 1.62E+01 | 2.83E+00 | 2.83E+00 |
| + | RA-225 | 40.00 | | 31.00 | 2.17E+01 | 3.00E+01 | 3.00E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 1.80E+00 | 2.42E+00 | 2.42E+00 |
| + | TH-227 | 50.10 | | 8.40 | -5.07E-01 | 7.65E-01 | 7.67E-01 |
| | | 236.00 | | 11.50 | 7.35E-02 | | 7.65E-01 |
| | | 256.20 | | 6.30 | 1.22E-01 | | 8.73E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.44E+00 | 3.45E-01 | 9.28E-01 |
| | | 911.07 | * | 27.70 | 1.06E+00 | | 3.45E-01 |
| | | 969.11 | * | 16.60 | 8.81E-01 | | 8.73E-01 |
| + | TH-230 | 48.44 | | 16.90 | 4.69E-01 | 4.17E-01 | 4.17E-01 |
| | | 62.85 | | 4.60 | 1.74E+00 | | 1.33E+00 |
| | | 67.67 | | 0.37 | -9.41E-01 | | 1.43E+01 |
| + | PA-231 | 283.67 | | 1.60 | -2.90E+00 | 2.69E+00 | 3.41E+00 |
| | | 302.67 | | 2.30 | 6.93E-01 | | 2.69E+00 |
| + | TH-231 | 25.64 | | 14.70 | -7.51E-01 | 7.84E-01 | 2.52E+00 |
| | | 84.21 | | 6.40 | -2.67E-01 | | 7.84E-01 |
| + | PA-233 | 311.98 | | 38.60 | -1.27E-01 | 1.82E+00 | 1.82E+00 |
| + | PA-234 | 131.20 | | 20.40 | 9.39E-02 | 2.23E-01 | 2.23E-01 |
| | | 733.99 | | 8.80 | 1.09E-01 | | 9.02E-01 |
| | | 946.00 | | 12.00 | 2.34E-02 | | 7.25E-01 |
| + | PA-234M | 1001.03 | | 0.92 | 6.97E+00 | 1.06E+01 | 1.06E+01 |
| + | TH-234 | 63.29 | * | 3.80 | 1.33E+00 | 1.99E+00 | 1.99E+00 |
| + | U-235 | 143.76 | | 10.50 | -2.60E-03 | 4.37E-01 | 4.37E-01 |
| | | 163.35 | | 4.70 | -8.89E-02 | | 9.56E-01 |
| | | 205.31 | | 4.70 | 1.59E-01 | | 1.21E+00 |
| + | NP-237 | 86.50 | | 12.60 | 4.78E-01 | 4.35E-01 | 4.35E-01 |
| + | NP-239 | 106.10 | | 22.70 | 1.09E+11 | 9.10E+11 | 9.10E+11 |
| | | 228.18 | | 10.70 | 6.83E+11 | | 2.79E+12 |
| | | 277.60 | | 14.10 | 3.35E+11 | | 2.08E+12 |
| + | AM-241 | 59.54 | | 35.90 | 6.13E-02 | 1.59E-01 | 1.59E-01 |
| + | AM-243 | 74.67 | | 66.00 | 3.21E-03 | 1.06E-01 | 1.06E-01 |
| + | CM-243 | 209.75 | | 3.29 | 1.82E+00 | 4.30E-01 | 1.85E+00 |
| | | 228.14 | | 10.60 | 1.41E-01 | | 5.76E-01 |
| | | 277.60 | | 14.00 | 6.91E-02 | | 4.30E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 2.24E+00 | 2.24E+00 | -4.21E-02 | 1.06E+00 |
| | NA-22 | 1274.54 | | 99.94 | 1.12E-01 | 1.12E-01 | 1.63E-02 | 5.18E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 5.99E-02 | 5.99E-02 | 1.13E-02 | 2.49E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.12E+00 | 1.12E+00 | 2.14E+01 | 5.18E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 5.60E-02 | 5.60E-02 | -3.69E-03 | 2.74E-02 |
| | | 78.34 | | 96.00 | 7.27E-02 | | 1.85E-01 | 3.58E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.77E-01 | 1.77E-01 | -8.91E-02 | 8.20E-02 |
| | | 1120.51 | | 99.99 | 3.12E-01 | | 3.08E-01 | 1.48E-01 |
| | V-48 | 983.52 | | 99.98 | 5.75E+00 | 5.75E+00 | -2.61E+00 | 2.64E+00 |
| | | 1312.10 | | 97.50 | 6.23E+00 | | -1.61E+00 | 2.81E+00 |
| | CR-51 | 320.08 | | 9.83 | 6.99E+00 | 6.99E+00 | 7.99E-01 | 3.36E+00 |
| | MN-54 | 834.83 | | 99.97 | 1.01E-01 | 1.01E-01 | 5.50E-02 | 4.70E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.85E-01 | 1.85E-01 | -3.42E-02 | 8.58E-02 |
| | | 1037.75 | | 14.03 | 1.48E+00 | | 2.83E-01 | 6.84E-01 |
| | | 1238.25 | | 67.00 | 4.93E-01 | | 3.33E-01 | 2.33E-01 |
| | | 1771.40 | | 15.51 | 1.08E+00 | | -3.12E+00 | 4.62E-01 |
| | | 2598.48 | | 16.90 | 8.04E-01 | | 2.68E-01 | 3.12E-01 |
| | CO-57 | 122.06 | | 85.51 | 6.25E-02 | 6.25E-02 | -3.31E-02 | 3.04E-02 |
| | | 136.48 | | 10.60 | 5.30E-01 | | -1.07E-02 | 2.58E-01 |
| | CO-58 | 810.76 | | 99.40 | 2.09E-01 | 2.09E-01 | 8.13E-02 | 9.77E-02 |
| | FE-59 | 1099.22 | | 56.50 | 8.12E-01 | 8.12E-01 | 3.46E-01 | 3.78E-01 |
| | | 1291.56 | | 43.20 | 1.05E+00 | | 8.70E-02 | 4.84E-01 |
| | CO-60 | 1173.22 | | 100.00 | 1.03E-01 | 8.56E-02 | -3.53E-03 | 4.79E-02 |
| | | 1332.49 | | 100.00 | 8.56E-02 | | -1.67E-02 | 3.86E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 2.66E-01 | 2.66E-01 | 2.01E-02 | 1.24E-01 |
| | GA-67 | 93.31 | | 35.70 | 2.27E+08 | 2.27E+08 | 4.86E+08 | 1.11E+08 |
| | | 208.95 | | 2.24 | 3.91E+09 | | 3.85E+09 | 1.90E+09 |
| | | 300.22 | | 16.00 | 6.24E+08 | | 2.23E+08 | 3.02E+08 |
| | SE-75 | 121.11 | | 16.70 | 4.49E-01 | 1.31E-01 | -5.75E-02 | 2.19E-01 |
| | | 136.00 | | 59.20 | 1.31E-01 | | -1.60E-03 | 6.35E-02 |
| | | 264.65 | | 59.80 | 1.57E-01 | | 1.43E-02 | 7.55E-02 |
| | | 279.53 | | 25.20 | 4.15E-01 | | 4.87E-02 | 2.01E-01 |
| | | 400.65 | | 11.40 | 9.16E-01 | | 7.38E-02 | 4.36E-01 |
| | RB-82 | 776.52 | | 13.00 | 8.25E+00 | 8.25E+00 | -2.08E-01 | 3.83E+00 |
| | RB-83 | 520.41 | | 46.00 | 3.06E-01 | 3.06E-01 | -8.19E-02 | 1.45E-01 |
| | | 529.64 | | 30.30 | 4.56E-01 | | -4.02E-01 | 2.15E-01 |
| | | 552.65 | | 16.40 | 9.37E-01 | | 7.30E-01 | 4.43E-01 |
| | KR-85 | 513.99 | | 0.43 | 2.22E+01 | 2.22E+01 | 2.81E+01 | 1.07E+01 |
| | SR-85 | 513.99 | | 99.27 | 2.76E-01 | 2.76E-01 | 3.49E-01 | 1.33E-01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| Y-88 | 898.02 | 93.40 | 1.58E-01 | 1.33E-01 | -1.23E-01 | 7.29E-02 |
| | 1836.01 | 99.38 | 1.33E-01 | | 1.40E-02 | 5.64E-02 |
| MO-93 | 263.06 | 56.72 | 9.70E-02 | 7.27E-02 | 8.59E-03 | 4.68E-02 |
| | 684.67 | 99.68 | 7.34E-02 | | 7.74E-03 | 3.44E-02 |
| | 1477.11 | 99.08 | 7.27E-02 | | -6.83E-04 | 3.18E-02 |
| NB-93M | 16.57 | 9.43 | 6.40E+01 | 6.40E+01 | 1.90E+01 | 3.12E+01 |
| NB-94 | 702.63 | 100.00 | 7.93E-02 | 7.17E-02 | -2.21E-02 | 3.74E-02 |
| | 871.10 | 100.00 | 7.17E-02 | | -1.30E-02 | 3.30E-02 |
| NB-95 | 765.79 | 99.81 | 6.70E-01 | 6.70E-01 | 4.64E-01 | 3.17E-01 |
| NB-95M | 235.69 | 25.00 | 6.68E+07 | 6.68E+07 | 6.42E+06 | 3.27E+07 |
| ZR-95 | 724.18 | 43.70 | 5.16E-01 | 4.47E-01 | -2.74E-02 | 2.42E-01 |
| | 756.72 | 55.30 | 4.47E-01 | | 2.26E-01 | 2.10E-01 |
| MO-99 | 181.06 | 6.20 | 5.44E+10 | 4.41E+10 | 7.16E+09 | 2.64E+10 |
| | 739.58 | 12.80 | 4.41E+10 | | 1.01E+10 | 2.07E+10 |
| | 778.00 | 4.50 | 1.17E+11 | | 8.31E+09 | 5.46E+10 |
| RU-103 | 497.08 | 89.00 | 4.24E-01 | 4.24E-01 | 6.59E-02 | 2.01E-01 |
| RU-106 | 621.84 | 9.80 | 8.51E-01 | 8.51E-01 | 1.94E-01 | 4.00E-01 |
| AG-108M | 433.93 | 89.90 | 6.73E-02 | 6.73E-02 | 2.01E-02 | 3.20E-02 |
| | 614.37 | 90.40 | 1.03E-01 | | -9.33E-03 | 4.90E-02 |
| | 722.95 | 90.50 | 8.14E-02 | | -8.47E-04 | 3.81E-02 |
| CD-109 | 88.03 | 3.72 | 1.70E+00 | 1.70E+00 | 1.54E+00 | 8.34E-01 |
| AG-110M | 657.75 | 93.14 | 1.09E-01 | 1.09E-01 | -1.41E-02 | 5.15E-02 |
| | 677.61 | 10.53 | 8.28E-01 | | -1.24E-01 | 3.86E-01 |
| | 706.67 | 16.46 | 6.24E-01 | | -1.90E-01 | 2.94E-01 |
| | 763.93 | 21.98 | 4.98E-01 | | -3.36E-01 | 2.34E-01 |
| | 884.67 | 71.63 | 1.50E-01 | | 7.55E-02 | 6.96E-02 |
| | 1384.27 | 23.94 | 4.23E-01 | | 4.00E-02 | 1.88E-01 |
| CD-113M | 263.70 | 0.02 | 2.38E+02 | 2.38E+02 | 2.12E+01 | 1.15E+02 |
| SN-113 | 255.12 | 1.93 | 5.16E+00 | 1.88E-01 | 1.21E+00 | 2.49E+00 |
| | 391.69 | 64.90 | 1.88E-01 | | 1.66E-01 | 9.04E-02 |
| TE123M | 159.00 | 84.10 | 9.26E-02 | 9.26E-02 | -5.18E-02 | 4.49E-02 |
| SB-124 | 602.71 | 97.87 | 2.30E-01 | 2.30E-01 | 4.22E-02 | 1.08E-01 |
| | 645.85 | 7.26 | 3.09E+00 | | -9.21E-01 | 1.45E+00 |
| | 722.78 | 11.10 | 2.08E+00 | | -2.16E-02 | 9.72E-01 |
| | 1691.02 | 49.00 | 3.24E-01 | | -2.76E-01 | 1.31E-01 |
| I-125 | 35.49 | 6.49 | 5.53E+00 | 5.53E+00 | -8.55E-01 | 2.69E+00 |
| SB-125 | 176.33 | 6.89 | 7.27E-01 | 2.12E-01 | 2.58E-01 | 3.53E-01 |
| | 427.89 | 29.33 | 2.12E-01 | | -8.31E-02 | 1.01E-01 |
| | 463.38 | 10.35 | 7.60E-01 | | 8.67E-01 | 3.64E-01 |
| | 600.56 | 17.80 | 4.38E-01 | | -4.31E-02 | 2.07E-01 |
| | 635.90 | 11.32 | 6.52E-01 | | -2.69E-01 | 3.06E-01 |
| SB-126 | 414.70 | 83.30 | 2.04E+01 | 1.96E+01 | -6.23E-01 | 9.76E+00 |
| | 666.33 | 99.60 | 2.00E+01 | | -3.00E+00 | 9.41E+00 |
| | 695.00 | 99.60 | 1.96E+01 | | -4.28E+00 | 9.22E+00 |
| | 720.50 | 53.80 | 3.44E+01 | | -8.88E+00 | 1.61E+01 |
| SN-126 | 87.57 | 37.00 | 1.47E-01 | 1.47E-01 | 1.33E-01 | 7.23E-02 |
| SB-127 | 473.00 | 25.00 | 1.42E+07 | 1.17E+07 | 3.70E+06 | 6.72E+06 |
| | 685.20 | 35.70 | 1.17E+07 | | 1.23E+06 | 5.47E+06 |
| | 783.80 | 14.70 | 3.14E+07 | | -3.06E+06 | 1.47E+07 |
| I-129 | 29.78 | 57.00 | 3.61E-01 | 3.61E-01 | 2.10E-01 | 1.76E-01 |
| | 33.60 | 13.20 | 1.02E+00 | | -1.06E-01 | 4.95E-01 |
| | 39.58 | 7.52 | 1.21E+00 | | 8.75E-01 | 5.90E-01 |
| I-131 | 284.30 | 6.05 | 4.87E+03 | 4.03E+02 | -3.54E+02 | 2.34E+03 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| I-131 | 364.48 | 81.20 | 4.03E+02 | 4.03E+02 | 2.89E+02 | 1.93E+02 |
| | 636.97 | 7.26 | 4.78E+03 | | -3.27E+03 | 2.24E+03 |
| | 722.89 | 1.80 | 2.13E+04 | | -2.22E+02 | 9.97E+03 |
| TE-132 | 49.72 | 13.10 | 7.40E+08 | 1.03E+08 | -4.89E+08 | 3.61E+08 |
| | 228.16 | 88.00 | 1.03E+08 | | 2.52E+07 | 4.99E+07 |
| BA-133 | 81.00 | 33.00 | 1.63E-01 | 1.51E-01 | -4.39E-01 | 7.96E-02 |
| | 302.84 | 17.80 | 3.55E-01 | | 9.12E-02 | 1.71E-01 |
| | 356.01 | 60.00 | 1.51E-01 | | -1.23E-02 | 7.33E-02 |
| @ I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| XE-133 | 81.00 | 38.00 | 6.96E+04 | 6.96E+04 | -1.88E+05 | 3.41E+04 |
| CS-134 | 563.23 | 8.38 | 8.99E-01 | 8.69E-02 | 2.22E-01 | 4.25E-01 |
| | 569.32 | 15.43 | 4.41E-01 | | -2.51E-01 | 2.07E-01 |
| | 604.70 | 97.60 | 8.69E-02 | | 2.99E-02 | 4.12E-02 |
| | 795.84 | 85.40 | 1.09E-01 | | 9.63E-02 | 5.11E-02 |
| | 801.93 | 8.73 | 9.14E-01 | | -1.02E-01 | 4.24E-01 |
| CS-135 | 268.24 | 16.00 | 3.66E-01 | 3.66E-01 | -7.21E-02 | 1.77E-01 |
| @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CS-136 | 153.22 | 7.46 | 1.19E+02 | 1.25E+01 | 4.68E+01 | 5.78E+01 |
| | 163.89 | 4.61 | 1.82E+02 | | -1.70E+01 | 8.84E+01 |
| | 176.55 | 13.56 | 6.45E+01 | | 2.28E+01 | 3.13E+01 |
| | 273.65 | 12.66 | 9.28E+01 | | -3.81E+00 | 4.49E+01 |
| | 340.57 | 48.50 | 2.91E+01 | | 5.46E+01 | 1.41E+01 |
| | 818.50 | 99.70 | 1.25E+01 | | -6.02E+00 | 5.73E+00 |
| | 1048.07 | 79.60 | 2.01E+01 | | -6.60E+00 | 9.29E+00 |
| | 1235.34 | 19.70 | 1.15E+02 | | -3.55E+01 | 5.37E+01 |
| CS-137 | 661.65 | 85.12 | 9.57E-02 | 9.57E-02 | -2.04E-02 | 4.53E-02 |
| LA-138 | 788.74 | 34.00 | 2.23E-01 | 1.20E-01 | -7.19E-02 | 1.04E-01 |
| | 1435.80 | 66.00 | 1.20E-01 | | 4.18E-02 | 5.34E-02 |
| CE-139 | 165.85 | 80.35 | 9.52E-02 | 9.52E-02 | 3.57E-02 | 4.62E-02 |
| BA-140 | 162.64 | 6.70 | 1.47E+02 | 6.30E+01 | 3.47E+01 | 7.12E+01 |
| | 304.84 | 4.50 | 2.81E+02 | | -8.04E+01 | 1.35E+02 |
| | 423.70 | 3.20 | 4.28E+02 | | 1.24E+02 | 2.04E+02 |
| | 437.55 | 2.00 | 6.67E+02 | | -1.75E+01 | 3.17E+02 |
| | 537.32 | 25.00 | 6.30E+01 | | 3.34E+01 | 2.99E+01 |
| LA-140 | 328.77 | 20.50 | 6.94E+01 | 2.06E+01 | 5.40E+01 | 3.34E+01 |
| | 487.03 | 45.50 | 2.97E+01 | | -5.87E-01 | 1.41E+01 |
| | 815.85 | 23.50 | 6.61E+01 | | 1.41E+01 | 3.06E+01 |
| | 1596.49 | 95.49 | 2.06E+01 | | -5.41E+00 | 9.27E+00 |
| CE-141 | 145.44 | 48.40 | 8.14E-01 | 8.14E-01 | 4.86E-01 | 3.96E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 5.16E-01 | 5.16E-01 | -4.68E-02 | 2.51E-01 |
| PM-144 | 476.78 | 42.00 | 1.89E-01 | 8.71E-02 | 4.19E-02 | 9.00E-02 |
| | 618.01 | 98.60 | 8.71E-02 | | -1.08E-02 | 4.10E-02 |
| | 696.49 | 99.49 | 9.04E-02 | | -3.56E-02 | 4.24E-02 |
| PM-145 | 36.85 | 21.70 | 4.93E-01 | 2.63E-01 | 1.59E-01 | 2.40E-01 |
| | 37.36 | 39.70 | 2.63E-01 | | -2.86E-02 | 1.28E-01 |
| | 42.30 | 15.10 | 5.14E-01 | | 1.13E-02 | 2.50E-01 |
| | 72.40 | 2.31 | 2.58E+00 | | 1.82E-01 | 1.26E+00 |
| PM-146 | 453.90 | 39.94 | 1.55E-01 | 1.55E-01 | -2.70E-03 | 7.36E-02 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| PM-146 | 735.90 | 14.01 | 5.77E-01 | 1.55E-01 | 9.65E-02 | 2.71E-01 |
| | 747.13 | 13.10 | 5.74E-01 | | -1.21E-01 | 2.68E-01 |
| ND-147 | 91.11 | 28.90 | 9.86E+01 | 9.86E+01 | -4.49E+01 | 4.83E+01 |
| | 531.02 | 13.10 | 2.52E+02 | | -2.69E+02 | 1.19E+02 |
| PM-149 | 285.90 | 3.10 | 6.01E+13 | 6.01E+13 | 2.13E+13 | 2.89E+13 |
| EU-152 | 121.78 | 20.50 | 2.05E-01 | 2.05E-01 | -1.09E-01 | 9.96E-02 |
| | 244.69 | 5.40 | 1.28E+00 | | 1.39E-01 | 6.21E-01 |
| | 344.27 | 19.13 | 3.08E-01 | | -5.21E-01 | 1.47E-01 |
| | 778.89 | 9.20 | 8.08E-01 | | -9.66E-03 | 3.76E-01 |
| | 964.01 | 10.40 | 1.00E+00 | | -3.78E-01 | 4.71E-01 |
| | 1085.78 | 7.22 | 1.32E+00 | | 2.86E-01 | 6.13E-01 |
| | 1112.02 | 9.60 | 1.09E+00 | | 2.16E-01 | 5.11E-01 |
| | 1407.95 | 14.94 | 5.18E-01 | | 6.07E-02 | 2.30E-01 |
| GD-153 | 97.43 | 31.30 | 1.77E-01 | 1.77E-01 | -3.71E-01 | 8.61E-02 |
| | 103.18 | 22.20 | 2.39E-01 | | -1.99E-01 | 1.16E-01 |
| EU-154 | 123.07 | 40.50 | 1.05E-01 | 1.05E-01 | -3.99E-02 | 5.10E-02 |
| | 723.30 | 19.70 | 3.82E-01 | | -3.97E-03 | 1.79E-01 |
| | 873.19 | 11.50 | 6.19E-01 | | -3.96E-01 | 2.85E-01 |
| | 996.32 | 10.30 | 8.23E-01 | | -4.62E-02 | 3.80E-01 |
| | 1004.76 | 17.90 | 5.46E-01 | | 2.20E-01 | 2.55E-01 |
| | 1274.45 | 35.50 | 2.99E-01 | | 4.35E-02 | 1.39E-01 |
| EU-155 | 86.50 | 30.90 | 1.84E-01 | 1.84E-01 | 2.02E-01 | 9.03E-02 |
| | 105.30 | 20.70 | 2.11E-01 | | 2.52E-02 | 1.03E-01 |
| EU-156 | 811.77 | 10.40 | 6.63E+01 | 6.63E+01 | 1.40E+01 | 3.08E+01 |
| | 1153.47 | 7.20 | 1.33E+02 | | 1.88E+01 | 6.18E+01 |
| | 1230.71 | 8.90 | 1.14E+02 | | 2.07E+01 | 5.28E+01 |
| HO-166M | 184.41 | 72.60 | 7.34E-02 | 7.34E-02 | 4.27E-02 | 3.57E-02 |
| | 280.45 | 29.60 | 1.96E-01 | | 5.80E-02 | 9.45E-02 |
| | 410.94 | 11.10 | 6.37E-01 | | 3.33E-01 | 3.06E-01 |
| | 711.69 | 54.10 | 1.46E-01 | | -1.62E-02 | 6.86E-02 |
| TM-171 | 66.72 | 0.14 | 4.31E+01 | 4.31E+01 | -4.47E+00 | 2.11E+01 |
| HF-172 | 67.35 | 5.31 | 1.10E+00 | 4.07E-01 | -7.27E-02 | 5.39E-01 |
| | 125.81 | 11.30 | 4.07E-01 | | -3.34E-01 | 1.98E-01 |
| LU-172 | 181.53 | 20.60 | 6.29E+03 | 4.34E+03 | 4.15E+02 | 3.05E+03 |
| | 900.72 | 29.81 | 7.95E+03 | | 2.68E+02 | 3.70E+03 |
| | 1093.66 | 62.50 | 4.34E+03 | | 1.28E+03 | 2.01E+03 |
| LU-173 | 100.72 | 5.24 | 8.95E-01 | 3.46E-01 | 1.72E-01 | 4.36E-01 |
| | 272.11 | 21.20 | 3.46E-01 | | 1.81E-01 | 1.68E-01 |
| HF-175 | 343.40 | 84.00 | 1.84E-01 | 1.84E-01 | -3.12E-01 | 8.83E-02 |
| LU-176 | 88.34 | 13.30 | 4.13E-01 | 5.45E-02 | 8.52E-02 | 2.03E-01 |
| | 201.83 | 86.00 | 5.45E-02 | | 4.83E-03 | 2.63E-02 |
| | 306.78 | 94.00 | 5.95E-02 | | -1.18E-02 | 2.86E-02 |
| HF-181 | 133.02 | 41.70 | 5.37E-01 | 3.91E-01 | -3.48E-03 | 2.61E-01 |
| | 345.85 | 17.20 | 1.65E+00 | | -3.28E+00 | 7.90E-01 |
| | 482.03 | 82.80 | 3.91E-01 | | -7.35E-02 | 1.85E-01 |
| TA-182 | 67.75 | 41.20 | 2.34E-01 | 2.34E-01 | -1.54E-02 | 1.14E-01 |
| | 1121.30 | 34.90 | 7.20E-01 | | 8.31E-01 | 3.42E-01 |
| | 1189.05 | 16.23 | 1.22E+00 | | -7.05E-01 | 5.71E-01 |
| | 1221.41 | 26.98 | 8.01E-01 | | 4.46E-01 | 3.75E-01 |
| | 1231.02 | 11.44 | 1.74E+00 | | 3.17E-01 | 8.08E-01 |
| IR-192 | 308.46 | 29.68 | 4.76E-01 | 3.18E-01 | 1.83E-01 | 2.29E-01 |
| | 468.07 | 48.10 | 3.18E-01 | | 5.92E-02 | 1.50E-01 |
| HG-203 | 279.19 | 77.30 | 3.35E-01 | 3.35E-01 | 3.64E-02 | 1.62E-01 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TL-204 | 374.74 | | 94.11 | 6.48E-02 | 6.48E-02 | -1.83E-02 | 3.09E-02 |
| | | 899.15 | | 99.16 | 8.54E-02 | | -2.52E-02 | 3.97E-02 |
| | | 911.74 | | 91.10 | 1.65E-01 | | 3.21E-01 | 7.91E-02 |
| | BI-207 | 569.67 | | 97.72 | 6.39E-02 | 6.39E-02 | -7.21E-03 | 3.00E-02 |
| | | 1063.62 | | 74.90 | 1.17E-01 | | 5.41E-02 | 5.39E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 3.11E-01 | 1.79E-01 | 1.09E+00 | 1.49E-01 |
| | | 860.37 | | 4.48 | 2.04E+00 | | 1.28E+00 | 9.58E-01 |
| | | 2614.66 | * | 35.85 | 1.79E-01 | | 9.08E-01 | 7.17E-02 |
| | BI-210M | 262.00 | | 45.00 | 1.23E-01 | 1.23E-01 | 1.06E-02 | 5.96E-02 |
| | | 300.00 | | 23.00 | 2.97E-01 | | 1.06E-01 | 1.44E-01 |
| + | PB-210 | 46.50 | * | 4.25 | 2.62E+00 | 2.62E+00 | 1.34E+00 | 1.29E+00 |
| | PB-211 | 404.84 | | 2.90 | 2.17E+00 | 2.17E+00 | -3.55E-01 | 1.04E+00 |
| | | 831.96 | | 2.90 | 2.46E+00 | | -1.36E+00 | 1.14E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 8.15E-01 | 8.15E-01 | 6.09E-01 | 3.87E-01 |
| | | 1620.62 | | 2.75 | 2.46E+00 | | -1.20E+00 | 1.06E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 2.38E-01 | 2.38E-01 | 1.15E+00 | 1.17E-01 |
| | | 300.09 | | 3.41 | 2.00E+00 | | 7.15E-01 | 9.69E-01 |
| + | BI-214 | 609.31 | * | 46.30 | 2.43E-01 | 2.43E-01 | 9.17E-01 | 1.17E-01 |
| | | 1120.29 | * | 15.10 | 1.08E+00 | | 8.14E-01 | 5.17E-01 |
| | | 1764.49 | | 15.80 | 9.08E-01 | | 1.25E+00 | 4.22E-01 |
| | | 2204.22 | * | 4.98 | 1.55E+00 | | 1.36E+00 | 6.58E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 5.03E-01 | 2.62E-01 | 7.82E-01 | 2.46E-01 |
| | | 351.92 | * | 37.19 | 2.62E-01 | | 1.13E+00 | 1.28E-01 |
| | RN-219 | 401.80 | | 6.50 | 9.07E-01 | 9.07E-01 | -8.85E-02 | 4.32E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.51E+00 | 1.51E+00 | 4.10E-01 | 7.26E-01 |
| | RA-224 | 240.98 | | 3.95 | 2.83E+00 | 2.83E+00 | 1.62E+01 | 1.39E+00 |
| | RA-225 | 40.00 | | 31.00 | 3.00E+01 | 3.00E+01 | 2.17E+01 | 1.46E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.42E+00 | 2.42E+00 | 1.80E+00 | 1.19E+00 |
| | TH-227 | 50.10 | | 8.40 | 7.67E-01 | 7.65E-01 | -5.07E-01 | 3.74E-01 |
| | | 236.00 | | 11.50 | 7.65E-01 | | 7.35E-02 | 3.75E-01 |
| | | 256.20 | | 6.30 | 8.73E-01 | | 1.22E-01 | 4.22E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 9.28E-01 | 3.45E-01 | 1.44E+00 | 4.54E-01 |
| | | 911.07 | * | 27.70 | 3.45E-01 | | 1.06E+00 | 1.62E-01 |
| | | 969.11 | * | 16.60 | 8.73E-01 | | 8.81E-01 | 4.18E-01 |
| | TH-230 | 48.44 | | 16.90 | 4.17E-01 | 4.17E-01 | 4.69E-01 | 2.04E-01 |
| | | 62.85 | | 4.60 | 1.33E+00 | | 1.74E+00 | 6.50E-01 |
| | | 67.67 | | 0.37 | 1.43E+01 | | -9.41E-01 | 6.98E+00 |
| | PA-231 | 283.67 | | 1.60 | 3.41E+00 | 2.69E+00 | -2.90E+00 | 1.64E+00 |
| | | 302.67 | | 2.30 | 2.69E+00 | | 6.93E-01 | 1.30E+00 |
| | TH-231 | 25.64 | | 14.70 | 2.52E+00 | 7.84E-01 | -7.51E-01 | 1.23E+00 |
| | | 84.21 | | 6.40 | 7.84E-01 | | -2.67E-01 | 3.84E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.82E+00 | 1.82E+00 | -1.27E-01 | 8.71E-01 |
| | PA-234 | 131.20 | | 20.40 | 2.23E-01 | 2.23E-01 | 9.39E-02 | 1.08E-01 |
| | | 733.99 | | 8.80 | 9.02E-01 | | 1.09E-01 | 4.23E-01 |
| | | 946.00 | | 12.00 | 7.25E-01 | | 2.34E-02 | 3.37E-01 |
| | PA-234M | 1001.03 | | 0.92 | 1.06E+01 | 1.06E+01 | 6.97E+00 | 4.95E+00 |
| + | TH-234 | 63.29 | * | 3.80 | 1.99E+00 | 1.99E+00 | 1.33E+00 | 9.77E-01 |
| | U-235 | 143.76 | | 10.50 | 4.37E-01 | 4.37E-01 | -2.60E-03 | 2.13E-01 |
| | | 163.35 | | 4.70 | 9.56E-01 | | -8.89E-02 | 4.64E-01 |
| | | 205.31 | | 4.70 | 1.21E+00 | | 1.59E-01 | 5.87E-01 |
| | NP-237 | 86.50 | | 12.60 | 4.35E-01 | 4.35E-01 | 4.78E-01 | 2.13E-01 |
| | NP-239 | 106.10 | | 22.70 | 9.10E+11 | 9.10E+11 | 1.09E+11 | 4.43E+11 |
| | | 228.18 | | 10.70 | 2.79E+12 | | 6.83E+11 | 1.35E+12 |

Analysis Report for 1707087-18

HTC-A03-S003-1824-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| NP-239 | 277.60 | 14.10 | 2.08E+12 | 9.10E+11 | 3.35E+11 | 1.01E+12 |
| AM-241 | 59.54 | 35.90 | 1.59E-01 | 1.59E-01 | 6.13E-02 | 7.79E-02 |
| AM-243 | 74.67 | 66.00 | 1.06E-01 | 1.06E-01 | 3.21E-03 | 5.22E-02 |
| CM-243 | 209.75 | 3.29 | 1.85E+00 | 4.30E-01 | 1.82E+00 | 9.03E-01 |
| | 228.14 | 10.60 | 5.76E-01 | | 1.41E-01 | 2.80E-01 |
| | 277.60 | 14.00 | 4.30E-01 | | 6.91E-02 | 2.08E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S003-1824-01

Elapsed Live time: 3600
Elapsed Real Time: 3608

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 8 | 218 | 227 | 168 | 168 | 114 | 98 | 133 |
| 17: | 104 | 121 | 99 | 98 | 104 | 95 | 113 | 94 |
| 25: | 88 | 98 | 88 | 104 | 92 | 89 | 98 | 116 |
| 33: | 87 | 83 | 88 | 99 | 96 | 105 | 105 | 98 |
| 41: | 113 | 95 | 82 | 95 | 101 | 101 | 160 | 143 |
| 49: | 118 | 117 | 120 | 106 | 122 | 133 | 101 | 123 |
| 57: | 114 | 138 | 143 | 145 | 132 | 140 | 193 | 205 |
| 65: | 197 | 130 | 135 | 144 | 144 | 156 | 159 | 172 |
| 73: | 142 | 186 | 283 | 402 | 354 | 485 | 268 | 156 |
| 81: | 122 | 120 | 131 | 119 | 166 | 143 | 168 | 221 |
| 89: | 175 | 160 | 155 | 149 | 210 | 261 | 163 | 106 |
| 97: | 99 | 88 | 96 | 101 | 94 | 100 | 76 | 78 |
| 105: | 93 | 109 | 109 | 94 | 104 | 93 | 86 | 81 |
| 113: | 101 | 103 | 97 | 107 | 102 | 109 | 98 | 88 |
| 121: | 87 | 89 | 82 | 78 | 87 | 93 | 90 | 68 |
| 129: | 107 | 109 | 80 | 97 | 85 | 86 | 97 | 69 |
| 137: | 83 | 87 | 85 | 76 | 92 | 74 | 85 | 86 |
| 145: | 106 | 90 | 90 | 93 | 79 | 84 | 87 | 102 |
| 153: | 61 | 88 | 100 | 82 | 75 | 85 | 79 | 51 |
| 161: | 64 | 69 | 81 | 73 | 80 | 56 | 88 | 79 |
| 169: | 59 | 68 | 78 | 76 | 66 | 64 | 60 | 69 |
| 177: | 74 | 76 | 72 | 63 | 63 | 68 | 60 | 54 |
| 185: | 67 | 110 | 138 | 107 | 59 | 57 | 61 | 66 |
| 193: | 48 | 62 | 64 | 52 | 52 | 56 | 61 | 53 |
| 201: | 57 | 69 | 65 | 42 | 67 | 41 | 57 | 69 |
| 209: | 73 | 83 | 65 | 61 | 50 | 42 | 56 | 59 |
| 217: | 52 | 65 | 53 | 49 | 59 | 54 | 56 | 58 |
| 225: | 61 | 59 | 59 | 57 | 55 | 56 | 53 | 44 |
| 233: | 59 | 51 | 53 | 48 | 74 | 141 | 382 | 344 |
| 241: | 110 | 126 | 100 | 70 | 36 | 35 | 46 | 36 |
| 249: | 33 | 38 | 34 | 41 | 41 | 34 | 43 | 38 |
| 257: | 30 | 41 | 41 | 39 | 54 | 35 | 25 | 36 |
| 265: | 33 | 25 | 38 | 40 | 39 | 58 | 49 | 64 |
| 273: | 44 | 31 | 44 | 37 | 46 | 42 | 45 | 37 |
| 281: | 26 | 35 | 34 | 36 | 32 | 23 | 34 | 41 |
| 289: | 38 | 35 | 25 | 39 | 35 | 54 | 83 | 142 |
| 297: | 80 | 38 | 33 | 43 | 48 | 44 | 30 | 26 |
| 305: | 29 | 35 | 23 | 34 | 31 | 23 | 21 | 31 |
| 313: | 24 | 21 | 36 | 23 | 30 | 27 | 31 | 22 |
| 321: | 32 | 30 | 24 | 31 | 19 | 28 | 37 | 37 |
| 329: | 49 | 29 | 35 | 31 | 23 | 33 | 32 | 28 |
| 337: | 29 | 70 | 76 | 52 | 32 | 34 | 22 | 24 |
| 345: | 20 | 17 | 27 | 25 | 27 | 31 | 63 | 154 |
| 353: | 204 | 73 | 33 | 25 | 25 | 19 | 21 | 23 |
| 361: | 24 | 33 | 35 | 22 | 27 | 27 | 23 | 19 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 16 | 19 | 23 | 27 | 18 | 22 | 14 | 20 |

Sample Title: HTC-A03-S003-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 25 | 24 | 27 | 25 | 25 | 20 | 17 | 18 |
| 385: | 20 | 30 | 18 | 19 | 35 | 27 | 19 | 29 |
| 393: | 26 | 21 | 31 | 19 | 18 | 18 | 21 | 14 |
| 401: | 18 | 18 | 24 | 23 | 18 | 20 | 24 | 27 |
| 409: | 31 | 28 | 24 | 29 | 27 | 25 | 22 | 23 |
| 417: | 13 | 24 | 24 | 20 | 18 | 26 | 19 | 21 |
| 425: | 25 | 15 | 18 | 22 | 8 | 19 | 10 | 20 |
| 433: | 19 | 15 | 21 | 21 | 18 | 20 | 14 | 15 |
| 441: | 17 | 24 | 14 | 16 | 11 | 19 | 22 | 22 |
| 449: | 17 | 18 | 11 | 23 | 14 | 14 | 10 | 19 |
| 457: | 21 | 15 | 15 | 13 | 18 | 31 | 28 | 34 |
| 465: | 22 | 14 | 18 | 10 | 16 | 16 | 11 | 12 |
| 473: | 8 | 26 | 15 | 20 | 11 | 17 | 18 | 17 |
| 481: | 20 | 20 | 14 | 16 | 9 | 18 | 22 | 12 |
| 489: | 15 | 14 | 16 | 12 | 20 | 22 | 11 | 20 |
| 497: | 15 | 15 | 11 | 20 | 18 | 11 | 20 | 14 |
| 505: | 20 | 16 | 15 | 13 | 21 | 36 | 54 | 64 |
| 513: | 39 | 24 | 14 | 18 | 17 | 14 | 18 | 15 |
| 521: | 12 | 16 | 6 | 16 | 16 | 13 | 16 | 14 |
| 529: | 13 | 11 | 14 | 14 | 8 | 17 | 26 | 23 |
| 537: | 16 | 16 | 8 | 15 | 17 | 12 | 14 | 18 |
| 545: | 11 | 14 | 12 | 10 | 8 | 13 | 11 | 21 |
| 553: | 12 | 17 | 14 | 16 | 12 | 7 | 19 | 21 |
| 561: | 8 | 7 | 20 | 21 | 9 | 13 | 11 | 13 |
| 569: | 11 | 9 | 8 | 13 | 13 | 16 | 9 | 11 |
| 577: | 5 | 13 | 11 | 11 | 18 | 30 | 89 | 98 |
| 585: | 53 | 19 | 8 | 17 | 17 | 9 | 22 | 12 |
| 593: | 15 | 11 | 8 | 13 | 19 | 17 | 15 | 14 |
| 601: | 10 | 12 | 19 | 12 | 18 | 10 | 10 | 30 |
| 609: | 87 | 146 | 63 | 27 | 16 | 12 | 18 | 8 |
| 617: | 13 | 9 | 16 | 13 | 12 | 10 | 12 | 11 |
| 625: | 9 | 10 | 10 | 14 | 7 | 11 | 17 | 12 |
| 633: | 12 | 18 | 11 | 9 | 9 | 10 | 10 | 6 |
| 641: | 21 | 11 | 8 | 12 | 17 | 7 | 17 | 9 |
| 649: | 13 | 9 | 15 | 15 | 15 | 10 | 7 | 13 |
| 657: | 17 | 12 | 12 | 11 | 22 | 20 | 12 | 15 |
| 665: | 11 | 20 | 15 | 10 | 9 | 11 | 8 | 16 |
| 673: | 11 | 9 | 11 | 7 | 8 | 18 | 4 | 8 |
| 681: | 8 | 10 | 10 | 14 | 13 | 10 | 10 | 8 |
| 689: | 11 | 12 | 13 | 13 | 18 | 11 | 13 | 5 |
| 697: | 7 | 15 | 15 | 12 | 10 | 14 | 18 | 15 |
| 705: | 10 | 9 | 14 | 14 | 10 | 12 | 14 | 11 |
| 713: | 16 | 11 | 11 | 11 | 13 | 10 | 7 | 11 |
| 721: | 11 | 12 | 5 | 12 | 9 | 11 | 18 | 39 |
| 729: | 15 | 6 | 14 | 10 | 11 | 9 | 6 | 15 |
| 737: | 16 | 7 | 14 | 9 | 8 | 9 | 12 | 8 |
| 745: | 9 | 12 | 16 | 4 | 7 | 9 | 9 | 12 |
| 753: | 5 | 11 | 14 | 18 | 10 | 14 | 10 | 10 |
| 761: | 12 | 7 | 13 | 13 | 8 | 16 | 14 | 20 |
| 769: | 23 | 14 | 8 | 13 | 12 | 10 | 7 | 7 |
| 777: | 8 | 11 | 10 | 7 | 9 | 9 | 7 | 11 |
| 785: | 4 | 18 | 14 | 7 | 10 | 4 | 4 | 7 |
| 793: | 12 | 13 | 17 | 15 | 10 | 8 | 5 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 5 | 13 | 12 | 9 | 6 | 16 | 7 | 13 |

Sample Title: HTC-A03-S003-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 7 | 8 | 12 | 5 | 9 | 12 | 5 | 3 |
| 817: | 7 | 7 | 10 | 4 | 6 | 8 | 12 | 6 |
| 825: | 10 | 10 | 8 | 5 | 6 | 6 | 6 | 6 |
| 833: | 7 | 11 | 9 | 15 | 12 | 6 | 6 | 7 |
| 841: | 7 | 9 | 9 | 7 | 8 | 13 | 8 | 8 |
| 849: | 6 | 8 | 7 | 12 | 8 | 7 | 8 | 5 |
| 857: | 9 | 6 | 7 | 16 | 25 | 12 | 6 | 8 |
| 865: | 9 | 11 | 10 | 6 | 8 | 7 | 6 | 7 |
| 873: | 7 | 6 | 4 | 7 | 12 | 10 | 10 | 8 |
| 881: | 3 | 9 | 8 | 6 | 10 | 8 | 11 | 8 |
| 889: | 3 | 9 | 8 | 7 | 9 | 15 | 5 | 6 |
| 897: | 11 | 4 | 6 | 7 | 13 | 10 | 12 | 7 |
| 905: | 9 | 7 | 11 | 3 | 11 | 19 | 58 | 65 |
| 913: | 19 | 11 | 4 | 8 | 10 | 9 | 10 | 10 |
| 921: | 6 | 6 | 4 | 6 | 8 | 3 | 9 | 9 |
| 929: | 8 | 7 | 6 | 5 | 13 | 19 | 6 | 7 |
| 937: | 6 | 7 | 2 | 5 | 7 | 6 | 12 | 14 |
| 945: | 5 | 3 | 9 | 8 | 10 | 8 | 14 | 10 |
| 953: | 9 | 10 | 10 | 12 | 7 | 8 | 7 | 6 |
| 961: | 9 | 3 | 5 | 20 | 21 | 17 | 9 | 15 |
| 969: | 30 | 27 | 17 | 7 | 6 | 7 | 9 | 7 |
| 977: | 9 | 9 | 7 | 8 | 13 | 3 | 4 | 12 |
| 985: | 2 | 4 | 6 | 9 | 9 | 9 | 10 | 5 |
| 993: | 7 | 11 | 8 | 2 | 6 | 9 | 7 | 6 |
| 1001: | 11 | 14 | 11 | 12 | 9 | 7 | 4 | 10 |
| 1009: | 6 | 7 | 11 | 6 | 4 | 11 | 8 | 6 |
| 1017: | 3 | 13 | 13 | 4 | 5 | 4 | 10 | 7 |
| 1025: | 11 | 10 | 10 | 3 | 9 | 6 | 5 | 9 |
| 1033: | 7 | 2 | 7 | 4 | 6 | 7 | 8 | 10 |
| 1041: | 9 | 9 | 7 | 7 | 3 | 12 | 5 | 8 |
| 1049: | 6 | 6 | 9 | 9 | 11 | 4 | 6 | 9 |
| 1057: | 13 | 9 | 5 | 6 | 6 | 8 | 7 | 3 |
| 1065: | 11 | 7 | 7 | 5 | 3 | 5 | 9 | 10 |
| 1073: | 4 | 8 | 7 | 10 | 9 | 13 | 10 | 8 |
| 1081: | 9 | 8 | 9 | 5 | 8 | 7 | 10 | 9 |
| 1089: | 8 | 3 | 8 | 7 | 7 | 6 | 7 | 4 |
| 1097: | 16 | 5 | 9 | 12 | 8 | 6 | 4 | 8 |
| 1105: | 7 | 8 | 9 | 7 | 12 | 10 | 7 | 11 |
| 1113: | 3 | 10 | 13 | 10 | 7 | 9 | 22 | 32 |
| 1121: | 22 | 13 | 13 | 8 | 7 | 9 | 8 | 3 |
| 1129: | 10 | 6 | 2 | 6 | 9 | 4 | 12 | 5 |
| 1137: | 3 | 6 | 13 | 11 | 10 | 11 | 7 | 5 |
| 1145: | 11 | 9 | 7 | 3 | 8 | 6 | 9 | 8 |
| 1153: | 7 | 12 | 11 | 8 | 15 | 5 | 7 | 12 |
| 1161: | 14 | 8 | 11 | 13 | 9 | 8 | 14 | 15 |
| 1169: | 10 | 9 | 6 | 12 | 10 | 3 | 6 | 9 |
| 1177: | 4 | 6 | 7 | 12 | 10 | 10 | 16 | 9 |
| 1185: | 11 | 11 | 5 | 4 | 13 | 5 | 15 | 12 |
| 1193: | 12 | 18 | 11 | 10 | 9 | 6 | 9 | 14 |
| 1201: | 14 | 11 | 4 | 6 | 14 | 12 | 8 | 10 |
| 1209: | 16 | 7 | 8 | 10 | 9 | 11 | 12 | 2 |
| 1217: | 9 | 12 | 11 | 11 | 8 | 6 | 8 | 18 |
| 1225: | 9 | 8 | 3 | 10 | 11 | 11 | 4 | 7 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 9 | 9 | 13 | 6 | 17 | 15 | 15 | 21 |

Sample Title: HTC-A03-S003-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 13 | 8 | 12 | 9 | 12 | 9 | 8 | 7 |
| 1249: | 7 | 8 | 4 | 9 | 9 | 9 | 10 | 5 |
| 1257: | 7 | 5 | 8 | 6 | 12 | 8 | 11 | 9 |
| 1265: | 9 | 3 | 5 | 6 | 3 | 6 | 7 | 6 |
| 1273: | 9 | 4 | 7 | 12 | 7 | 11 | 6 | 4 |
| 1281: | 7 | 5 | 6 | 5 | 8 | 10 | 4 | 5 |
| 1289: | 5 | 8 | 6 | 7 | 8 | 5 | 5 | 5 |
| 1297: | 9 | 3 | 6 | 6 | 3 | 7 | 5 | 3 |
| 1305: | 11 | 3 | 6 | 5 | 7 | 6 | 4 | 4 |
| 1313: | 2 | 1 | 5 | 5 | 5 | 8 | 6 | 5 |
| 1321: | 4 | 1 | 7 | 3 | 7 | 3 | 5 | 3 |
| 1329: | 2 | 2 | 4 | 3 | 5 | 7 | 6 | 6 |
| 1337: | 6 | 1 | 2 | 5 | 3 | 2 | 3 | 3 |
| 1345: | 3 | 7 | 9 | 6 | 6 | 6 | 1 | 2 |
| 1353: | 1 | 3 | 2 | 2 | 5 | 3 | 1 | 3 |
| 1361: | 0 | 4 | 4 | 2 | 2 | 2 | 0 | 7 |
| 1369: | 1 | 3 | 4 | 5 | 4 | 1 | 3 | 4 |
| 1377: | 8 | 11 | 3 | 4 | 3 | 3 | 3 | 3 |
| 1385: | 3 | 6 | 2 | 3 | 2 | 4 | 1 | 2 |
| 1393: | 2 | 4 | 2 | 0 | 0 | 4 | 1 | 2 |
| 1401: | 3 | 3 | 2 | 2 | 2 | 5 | 4 | 3 |
| 1409: | 2 | 2 | 4 | 2 | 9 | 4 | 5 | 5 |
| 1417: | 5 | 1 | 0 | 2 | 2 | 1 | 4 | 4 |
| 1425: | 5 | 1 | 1 | 3 | 0 | 2 | 3 | 3 |
| 1433: | 3 | 6 | 3 | 6 | 1 | 0 | 4 | 1 |
| 1441: | 2 | 4 | 2 | 2 | 2 | 6 | 3 | 1 |
| 1449: | 3 | 1 | 3 | 0 | 4 | 3 | 2 | 2 |
| 1457: | 2 | 10 | 49 | 185 | 310 | 137 | 37 | 4 |
| 1465: | 1 | 1 | 3 | 2 | 1 | 0 | 1 | 1 |
| 1473: | 2 | 3 | 2 | 3 | 2 | 1 | 0 | 1 |
| 1481: | 3 | 2 | 3 | 0 | 5 | 3 | 3 | 1 |
| 1489: | 3 | 1 | 2 | 2 | 3 | 0 | 6 | 4 |
| 1497: | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 1 |
| 1505: | 1 | 1 | 5 | 5 | 2 | 3 | 1 | 3 |
| 1513: | 4 | 2 | 2 | 2 | 2 | 2 | 3 | 1 |
| 1521: | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 3 |
| 1529: | 2 | 0 | 6 | 4 | 1 | 2 | 1 | 4 |
| 1537: | 1 | 1 | 1 | 1 | 3 | 0 | 3 | 0 |
| 1545: | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 |
| 1553: | 1 | 4 | 0 | 2 | 2 | 1 | 2 | 0 |
| 1561: | 2 | 1 | 0 | 0 | 2 | 0 | 2 | 2 |
| 1569: | 0 | 2 | 5 | 3 | 2 | 2 | 3 | 0 |
| 1577: | 3 | 0 | 1 | 3 | 1 | 1 | 4 | 3 |
| 1585: | 2 | 2 | 3 | 3 | 4 | 1 | 9 | 5 |
| 1593: | 5 | 4 | 3 | 2 | 1 | 2 | 2 | 2 |
| 1601: | 2 | 4 | 1 | 0 | 2 | 1 | 0 | 3 |
| 1609: | 2 | 0 | 0 | 3 | 3 | 2 | 3 | 1 |
| 1617: | 0 | 2 | 1 | 3 | 4 | 0 | 0 | 2 |
| 1625: | 1 | 4 | 2 | 3 | 2 | 3 | 4 | 1 |
| 1633: | 2 | 1 | 2 | 1 | 1 | 1 | 3 | 1 |
| 1641: | 3 | 0 | 1 | 3 | 2 | 3 | 1 | 1 |
| 1649: | 3 | 2 | 2 | 2 | 1 | 3 | 2 | 3 |
| 1657: | 0 | 0 | 1 | 0 | 2 | 1 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 3 | 0 | 3 | 2 | 3 | 1 | 3 | 0 |

Sample Title: HTC-A03-S003-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 0 | 1 | 0 | 5 | 1 | 2 | 0 | 1 |
| 1681: | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 0 |
| 1689: | 1 | 1 | 0 | 1 | 2 | 0 | 0 | 3 |
| 1697: | 1 | 1 | 2 | 3 | 2 | 2 | 0 | 0 |
| 1705: | 2 | 0 | 0 | 2 | 2 | 2 | 0 | 0 |
| 1713: | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 1 |
| 1721: | 1 | 3 | 0 | 1 | 1 | 1 | 0 | 2 |
| 1729: | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 |
| 1737: | 0 | 1 | 2 | 0 | 1 | 3 | 0 | 2 |
| 1745: | 1 | 1 | 2 | 0 | 2 | 0 | 1 | 2 |
| 1753: | 2 | 4 | 2 | 0 | 1 | 0 | 0 | 1 |
| 1761: | 2 | 4 | 7 | 14 | 15 | 14 | 2 | 1 |
| 1769: | 2 | 1 | 2 | 2 | 2 | 0 | 0 | 4 |
| 1777: | 3 | 1 | 2 | 0 | 1 | 0 | 1 | 1 |
| 1785: | 1 | 1 | 0 | 2 | 1 | 0 | 2 | 3 |
| 1793: | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 2 |
| 1801: | 2 | 0 | 1 | 0 | 1 | 2 | 1 | 1 |
| 1809: | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 3 |
| 1817: | 2 | 0 | 0 | 1 | 2 | 1 | 1 | 0 |
| 1825: | 2 | 1 | 1 | 3 | 0 | 0 | 0 | 3 |
| 1833: | 0 | 0 | 0 | 2 | 1 | 1 | 2 | 2 |
| 1841: | 0 | 4 | 0 | 1 | 2 | 2 | 1 | 6 |
| 1849: | 1 | 2 | 0 | 2 | 0 | 1 | 2 | 0 |
| 1857: | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| 1865: | 1 | 0 | 1 | 1 | 3 | 0 | 2 | 2 |
| 1873: | 1 | 2 | 2 | 0 | 0 | 1 | 0 | 2 |
| 1881: | 3 | 1 | 1 | 1 | 2 | 3 | 3 | 1 |
| 1889: | 0 | 1 | 0 | 4 | 1 | 1 | 1 | 0 |
| 1897: | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |
| 1905: | 4 | 0 | 0 | 2 | 1 | 0 | 1 | 1 |
| 1913: | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1921: | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 |
| 1929: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 2 |
| 1937: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 1945: | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 0 |
| 1953: | 2 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1961: | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 3 |
| 1969: | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1977: | 0 | 1 | 5 | 2 | 0 | 0 | 0 | 1 |
| 1985: | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 0 |
| 1993: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 1 |
| 2001: | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 1 |
| 2009: | 0 | 3 | 1 | 0 | 1 | 0 | 0 | 2 |
| 2017: | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 0 |
| 2025: | 0 | 1 | 2 | 1 | 0 | 1 | 0 | 3 |
| 2033: | 1 | 1 | 2 | 1 | 2 | 0 | 2 | 0 |
| 2041: | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 0 |
| 2049: | 0 | 0 | 3 | 2 | 1 | 1 | 1 | 1 |
| 2057: | 2 | 1 | 2 | 0 | 1 | 1 | 0 | 1 |
| 2065: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 2073: | 1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 |
| 2081: | 2 | 2 | 0 | 1 | 1 | 0 | 0 | 1 |
| 2089: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 0 | 1 | 0 | 2 | 1 | 3 | 3 | 1 |

Sample Title: HTC-A03-S003-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 2113: | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| 2121: | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 4 |
| 2129: | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 2 |
| 2137: | 1 | 0 | 0 | 1 | 1 | 3 | 1 | 0 |
| 2145: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 2153: | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 1 |
| 2161: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2169: | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 1 |
| 2177: | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0 |
| 2185: | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 2 |
| 2193: | 3 | 1 | 1 | 1 | 0 | 1 | 1 | 2 |
| 2201: | 0 | 1 | 4 | 7 | 6 | 2 | 1 | 1 |
| 2209: | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |
| 2217: | 1 | 2 | 4 | 1 | 1 | 0 | 1 | 0 |
| 2225: | 2 | 0 | 0 | 1 | 1 | 3 | 0 | 2 |
| 2233: | 1 | 0 | 0 | 0 | 1 | 1 | 5 | 2 |
| 2241: | 2 | 1 | 1 | 2 | 2 | 0 | 0 | 2 |
| 2249: | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 1 |
| 2257: | 2 | 1 | 1 | 0 | 0 | 1 | 2 | 0 |
| 2265: | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 1 |
| 2273: | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 2 |
| 2281: | 0 | 1 | 2 | 1 | 3 | 1 | 1 | 2 |
| 2289: | 2 | 1 | 1 | 0 | 0 | 1 | 2 | 3 |
| 2297: | 0 | 2 | 1 | 1 | 2 | 0 | 2 | 0 |
| 2305: | 1 | 0 | 1 | 0 | 0 | 2 | 3 | 1 |
| 2313: | 1 | 2 | 0 | 1 | 1 | 1 | 3 | 1 |
| 2321: | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 2 |
| 2329: | 0 | 2 | 0 | 1 | 1 | 0 | 1 | 2 |
| 2337: | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 |
| 2345: | 2 | 0 | 0 | 1 | 2 | 0 | 1 | 3 |
| 2353: | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 2361: | 1 | 1 | 1 | 3 | 1 | 0 | 1 | 2 |
| 2369: | 1 | 2 | 2 | 1 | 0 | 0 | 1 | 1 |
| 2377: | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 |
| 2385: | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 1 |
| 2393: | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 1 |
| 2401: | 0 | 2 | 0 | 1 | 3 | 0 | 1 | 2 |
| 2409: | 0 | 1 | 2 | 3 | 0 | 0 | 1 | 0 |
| 2417: | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 1 |
| 2425: | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 3 |
| 2433: | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 1 |
| 2441: | 0 | 3 | 0 | 1 | 3 | 2 | 4 | 3 |
| 2449: | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 1 |
| 2457: | 2 | 1 | 2 | 2 | 0 | 0 | 0 | 2 |
| 2465: | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2473: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2481: | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2489: | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 2 |
| 2497: | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 |
| 2505: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2513: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2521: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2545: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2553: | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 0 |
| 2561: | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2569: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| 2577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2585: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2593: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2601: | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2609: | 0 | 0 | 1 | 3 | 20 | 22 | 20 | 5 |
| 2617: | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 1 |
| 2649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2657: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2665: | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2673: | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2689: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2705: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2713: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2721: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2729: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2737: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2745: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2761: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2777: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |
| 2793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2809: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2817: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 2841: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2857: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2865: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2873: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2881: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2889: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2913: | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2929: | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 0 |
| 2937: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2953: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |

Sample Title: HTC-A03-S003-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2985: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2993: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3001: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3049: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3057: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3065: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3105: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3121: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3161: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3169: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3177: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3185: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3193: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3201: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3233: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3353: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3369: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 3385: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-1824-01

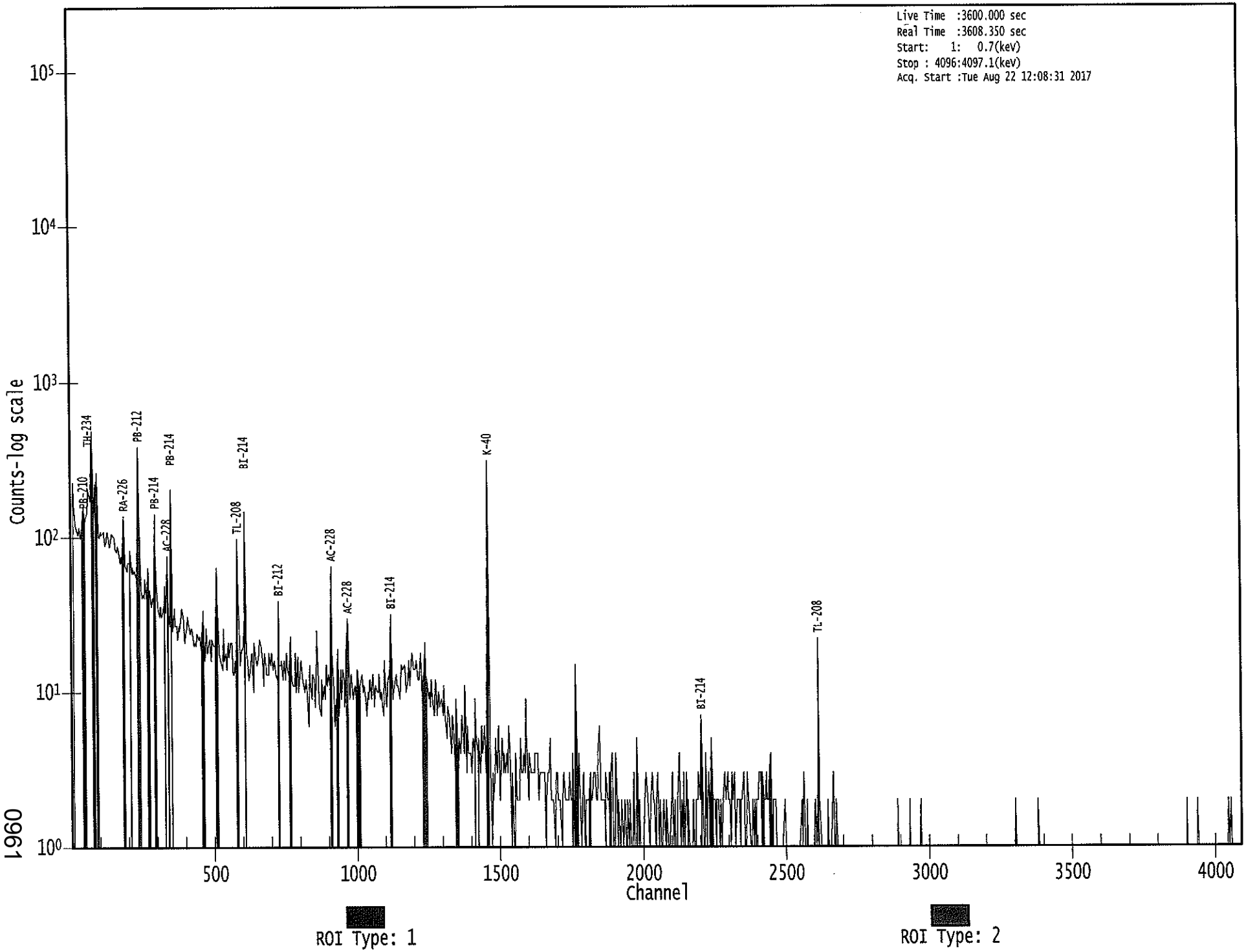
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3441: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3505: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3513: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3601: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3609: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3617: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3713: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3729: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3785: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3817: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

Sample Title: HTC-A03-S003-1824-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3841: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 |
| 3905: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3953: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 4049: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 4057: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 4065: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# 0000055725.CNF




0961

Apex-Gamma

Analysis Report for 1707087-19
HTC-A03-S003-2430-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-19 |
| Sample Description | : HTC-A03-S003-2430-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.059E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:47:58AM |
| Acquisition Started | : 8/22/2017 12:23:02PM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE4 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3620.5 seconds |
| Dead Time | : 0.57 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 15 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55720 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG
8/23/17

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 1:23:24PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 76.11 | 75.16 | 0.0000 | 0.00 |
| 2 | 86.61 | 85.67 | 0.0000 | 0.00 |
| 3 | 92.51 | 91.57 | 0.0000 | 0.00 |
| 4 | 100.36 | 99.42 | 0.0000 | 0.00 |
| 5 | 186.13 | 185.22 | 0.0000 | 0.00 |
| 6 | 239.29 | 238.40 | 0.0000 | 0.00 |
| 7 | 273.23 | 272.35 | 0.0000 | 0.00 |
| 8 | 295.47 | 294.60 | 0.0000 | 0.00 |
| 9 | 328.05 | 327.19 | 0.0000 | 0.00 |
| 10 | 338.15 | 337.30 | 0.0000 | 0.00 |
| 11 | 351.93 | 351.08 | 0.0000 | 0.00 |
| 12 | 463.79 | 462.98 | 0.0000 | 0.00 |
| 13 | 510.30 | 509.50 | 0.0000 | 0.00 |
| 14 | 570.58 | 569.80 | 0.0000 | 0.00 |
| 15 | 583.10 | 582.33 | 0.0000 | 0.00 |
| 16 | 609.47 | 608.72 | 0.0000 | 0.00 |
| 17 | 629.43 | 628.68 | 0.0000 | 0.00 |
| 18 | 727.79 | 727.07 | 0.0000 | 0.00 |
| 19 | 784.64 | 783.95 | 0.0000 | 0.00 |
| 20 | 861.07 | 860.41 | 0.0000 | 0.00 |
| 21 | 911.36 | 910.72 | 0.0000 | 0.00 |
| 22 | 927.09 | 926.46 | 0.0000 | 0.00 |
| 23 | 969.42 | 968.81 | 0.0000 | 0.00 |
| 24 | 981.37 | 980.76 | 0.0000 | 0.00 |
| 25 | 1010.45 | 1009.86 | 0.0000 | 0.00 |
| 26 | 1107.43 | 1106.88 | 0.0000 | 0.00 |
| 27 | 1120.53 | 1119.98 | 0.0000 | 0.00 |
| 28 | 1186.94 | 1186.43 | 0.0000 | 0.00 |
| 29 | 1407.84 | 1407.44 | 0.0000 | 0.00 |
| 30 | 1460.53 | 1460.15 | 0.0000 | 0.00 |
| 31 | 1518.51 | 1518.16 | 0.0000 | 0.00 |
| 32 | 1629.10 | 1628.81 | 0.0000 | 0.00 |
| 33 | 1696.79 | 1696.54 | 0.0000 | 0.00 |
| 34 | 1764.02 | 1763.80 | 0.0000 | 0.00 |
| 35 | 2040.59 | 2040.53 | 0.0000 | 0.00 |
| 36 | 2060.64 | 2060.60 | 0.0000 | 0.00 |
| 37 | 2203.30 | 2203.34 | 0.0000 | 0.00 |
| 38 | 2211.03 | 2211.08 | 0.0000 | 0.00 |
| 39 | 2613.65 | 2613.96 | 0.0000 | 0.00 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 1:23:24PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|
| 1 | 76.11 | 70 - | 82 | 75.16 | 1.04E+03 | 174.21 | 3.08E+03 | 4.17 |
| 2 | 86.61 | 82 - | 88 | 85.67 | 1.51E+02 | 99.11 | 1.69E+03 | 2.04 |
| 3 | 92.51 | 89 - | 97 | 91.57 | 1.77E+02 | 115.44 | 1.86E+03 | 1.97 |
| 4 | 100.36 | 97 - | 102 | 99.42 | 7.46E+01 | 69.04 | 8.93E+02 | 3.43 |
| 5 | 186.13 | 182 - | 189 | 185.22 | 1.44E+02 | 75.18 | 8.50E+02 | 1.94 |
| 6 | 239.29 | 234 - | 244 | 238.40 | 8.55E+02 | 95.95 | 7.75E+02 | 2.46 |
| 7 | 273.23 | 265 - | 279 | 272.35 | 1.61E+02 | 88.42 | 7.46E+02 | 8.82 |
| 8 | 295.47 | 290 - | 299 | 294.60 | 1.46E+02 | 71.42 | 6.47E+02 | 2.23 |
| 9 | 328.05 | 323 - | 330 | 327.19 | 4.59E+01 | 47.37 | 3.42E+02 | 3.64 |
| 10 | 338.15 | 333 - | 342 | 337.30 | 1.19E+02 | 58.48 | 4.22E+02 | 2.14 |
| 11 | 351.93 | 346 - | 356 | 351.08 | 3.06E+02 | 68.78 | 4.69E+02 | 2.51 |
| 12 | 463.79 | 459 - | 469 | 462.98 | 4.25E+01 | 47.25 | 2.75E+02 | 2.86 |
| 13 | 510.30 | 504 - | 515 | 509.50 | 1.08E+02 | 55.03 | 3.25E+02 | 2.75 |
| 14 | 570.58 | 566 - | 574 | 569.80 | 3.08E+01 | 31.74 | 1.38E+02 | 5.73 |
| 15 | 583.10 | 576 - | 587 | 582.33 | 1.76E+02 | 51.69 | 2.46E+02 | 2.03 |
| 16 | 609.47 | 601 - | 616 | 608.72 | 2.30E+02 | 62.83 | 2.98E+02 | 2.13 |
| 17 | 629.43 | 624 - | 632 | 628.68 | 3.28E+01 | 30.84 | 1.26E+02 | 2.79 |
| 18 | 727.79 | 720 - | 733 | 727.07 | 6.67E+01 | 43.61 | 1.81E+02 | 3.39 |
| 19 | 784.64 | 781 - | 788 | 783.95 | 3.39E+01 | 24.74 | 7.83E+01 | 3.06 |
| 20 | 861.07 | 856 - | 868 | 860.41 | 2.95E+01 | 36.52 | 1.43E+02 | 4.62 |
| 21 | 911.36 | 906 - | 915 | 910.72 | 9.21E+01 | 28.65 | 6.37E+01 | 2.30 |
| 22 | 927.09 | 923 - | 929 | 926.46 | 1.75E+01 | 21.28 | 6.90E+01 | 1.16 |
| 23 | 969.42 | 965 - | 974 | 968.81 | 3.77E+01 | 39.66 | 1.99E+02 | 2.14 |
| 24 | 981.37 | 978 - | 984 | 980.76 | 1.47E+01 | 18.75 | 5.47E+01 | 2.84 |
| 25 | 1010.45 | 1005 - | 1014 | 1009.86 | 3.40E+01 | 26.38 | 8.00E+01 | 2.21 |
| 26 | 1107.43 | 1103 - | 1111 | 1106.88 | 3.30E+01 | 25.70 | 8.20E+01 | 2.83 |
| 27 | 1120.53 | 1116 - | 1124 | 1119.98 | 5.60E+01 | 26.31 | 7.20E+01 | 3.17 |
| 28 | 1186.94 | 1184 - | 1189 | 1186.43 | 1.74E+01 | 17.92 | 4.93E+01 | 1.58 |
| 29 | 1407.84 | 1405 - | 1411 | 1407.44 | 1.02E+01 | 13.18 | 2.36E+01 | 3.61 |
| 30 | 1460.53 | 1455 - | 1467 | 1460.15 | 4.98E+02 | 47.62 | 3.12E+01 | 2.72 |
| 31 | 1518.51 | 1514 - | 1523 | 1518.16 | 1.02E+01 | 8.77 | 5.54E+00 | 6.05 |
| 32 | 1629.10 | 1625 - | 1631 | 1628.81 | 6.67E+00 | 9.21 | 1.07E+01 | 1.64 |
| 33 | 1696.79 | 1692 - | 1700 | 1696.54 | 7.80E+00 | 7.76 | 4.40E+00 | 5.81 |
| 34 | 1764.02 | 1759 - | 1767 | 1763.80 | 2.99E+01 | 12.18 | 4.16E+00 | 2.90 |
| 35 | 2040.59 | 2038 - | 2043 | 2040.53 | 5.79E+00 | 6.08 | 2.43E+00 | 2.15 |
| 36 | 2060.64 | 2057 - | 2063 | 2060.60 | 1.00E+01 | 6.32 | 0.00E+00 | 2.32 |
| 37 | 2203.30 | 2198 - | 2207 | 2203.34 | 1.57E+01 | 9.85 | 4.56E+00 | 2.16 |
| 38 | 2211.03 | 2208 - | 2214 | 2211.08 | 6.56E+00 | 6.65 | 2.88E+00 | 3.31 |
| 39 | 2613.65 | 2609 - | 2618 | 2613.96 | 5.50E+01 | 14.83 | 0.00E+00 | 2.37 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 1:23:24PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 1 | 76.11 | 70 - | 82 | 1.04E+03 | 174.21 | 3.08E+03 | 1.33E+02 |
| 2 | 86.61 | 82 - | 88 | 1.51E+02 | 99.11 | 1.69E+03 | 7.89E+01 |
| 3 | 92.51 | 89 - | 97 | 1.77E+02 | 115.44 | 1.86E+03 | 9.23E+01 |
| 4 | 100.36 | 97 - | 102 | 7.46E+01 | 69.04 | 8.93E+02 | 5.49E+01 |
| 5 | 186.13 | 182 - | 189 | 1.44E+02 | 75.18 | 8.50E+02 | 5.86E+01 |
| 6 | 239.29 | 234 - | 244 | 8.55E+02 | 95.95 | 7.75E+02 | 6.25E+01 |
| 7 | 273.23 | 265 - | 279 | 1.61E+02 | 88.42 | 7.46E+02 | 6.96E+01 |
| 8 | 295.47 | 290 - | 299 | 1.46E+02 | 71.42 | 6.47E+02 | 5.53E+01 |
| 9 | 328.05 | 323 - | 330 | 4.59E+01 | 47.37 | 3.42E+02 | 3.73E+01 |
| 10 | 338.15 | 333 - | 342 | 1.19E+02 | 58.48 | 4.22E+02 | 4.46E+01 |
| 11 | 351.93 | 346 - | 356 | 3.06E+02 | 68.78 | 4.69E+02 | 4.87E+01 |
| 12 | 463.79 | 459 - | 469 | 4.25E+01 | 47.25 | 2.75E+02 | 3.73E+01 |
| 13 | 510.30 | 504 - | 515 | 1.08E+02 | 55.03 | 3.25E+02 | 4.19E+01 |
| 14 | 570.58 | 566 - | 574 | 3.08E+01 | 31.74 | 1.38E+02 | 2.44E+01 |
| 15 | 583.10 | 576 - | 587 | 1.76E+02 | 51.69 | 2.46E+02 | 3.65E+01 |
| 16 | 609.47 | 601 - | 616 | 2.30E+02 | 62.83 | 2.98E+02 | 1.77E+01 |
| 17 | 629.43 | 624 - | 632 | 3.28E+01 | 30.84 | 1.26E+02 | 2.35E+01 |
| 18 | 727.79 | 720 - | 733 | 6.67E+01 | 43.61 | 1.81E+02 | 1.25E+01 |
| 19 | 784.64 | 781 - | 788 | 3.39E+01 | 24.74 | 7.83E+01 | 1.79E+01 |
| 20 | 861.07 | 856 - | 868 | 2.95E+01 | 36.52 | 1.43E+02 | 2.87E+01 |
| 21 | 911.36 | 906 - | 915 | 9.21E+01 | 28.65 | 6.37E+01 | 1.75E+01 |
| 22 | 927.09 | 923 - | 929 | 1.75E+01 | 21.28 | 6.90E+01 | 1.61E+01 |
| 23 | 969.42 | 965 - | 974 | 3.77E+01 | 39.66 | 1.99E+02 | 3.10E+01 |
| 24 | 981.37 | 978 - | 984 | 1.47E+01 | 18.75 | 5.47E+01 | 1.41E+01 |
| 25 | 1010.45 | 1005 - | 1014 | 3.40E+01 | 26.38 | 8.00E+01 | 1.95E+01 |
| 26 | 1107.43 | 1103 - | 1111 | 3.30E+01 | 25.70 | 8.20E+01 | 1.89E+01 |
| 27 | 1120.53 | 1116 - | 1124 | 5.60E+01 | 26.31 | 7.20E+01 | 1.78E+01 |
| 28 | 1186.94 | 1184 - | 1189 | 1.74E+01 | 17.92 | 4.93E+01 | 1.30E+01 |
| 29 | 1407.84 | 1405 - | 1411 | 1.02E+01 | 13.18 | 2.36E+01 | 9.48E+00 |
| 30 | 1460.53 | 1455 - | 1467 | 4.98E+02 | 47.62 | 3.12E+01 | 1.36E+01 |
| 31 | 1518.51 | 1514 - | 1523 | 1.02E+01 | 8.77 | 5.54E+00 | 4.94E+00 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|
| 32 | 1629.10 | 1625 - | 1631 | 6.67E+00 | 9.21 | 1.07E+01 | 6.26E+00 |
| 33 | 1696.79 | 1692 - | 1700 | 7.80E+00 | 7.76 | 4.40E+00 | 4.43E+00 |
| 34 | 1764.02 | 1759 - | 1767 | 2.99E+01 | 12.18 | 4.16E+00 | 4.39E+00 |
| 35 | 2040.59 | 2038 - | 2043 | 5.79E+00 | 6.08 | 2.43E+00 | 3.06E+00 |
| 36 | 2060.64 | 2057 - | 2063 | 1.00E+01 | 6.32 | 0.00E+00 | 0.00E+00 |
| 37 | 2203.30 | 2198 - | 2207 | 1.57E+01 | 9.85 | 4.56E+00 | 4.80E+00 |
| 38 | 2211.03 | 2208 - | 2214 | 6.56E+00 | 6.65 | 2.88E+00 | 3.49E+00 |
| 39 | 2613.65 | 2609 - | 2618 | 5.50E+01 | 14.83 | 0.00E+00 | 0.00E+00 |

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 1:23:24PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|
| 1 | 76.11 | 70 - | 82 | 75.16 | 1.04E+03 | 174.21 | 3.08E+03 | ..... |
| 2 | 86.61 | 82 - | 88 | 85.67 | 1.51E+02 | 99.11 | 1.69E+03 | NP-237 |
| | | | | | | | | EU-155 |
| | | | | | | | | SN-126 |
| 3 | 92.51 | 89 - | 97 | 91.57 | 1.77E+02 | 115.44 | 1.86E+03 | GA-67 |
| 4 | 100.36 | 97 - | 102 | 99.42 | 7.46E+01 | 69.04 | 8.93E+02 | LU-173 |
| 5 | 186.13 | 182 - | 189 | 185.22 | 1.44E+02 | 75.18 | 8.50E+02 | RA-226 |
| 6 | 239.29 | 234 - | 244 | 238.40 | 8.55E+02 | 95.95 | 7.75E+02 | PB-212 |
| 7 | 273.23 | 265 - | 279 | 272.35 | 1.61E+02 | 88.42 | 7.46E+02 | CS-136 |
| 8 | 295.47 | 290 - | 299 | 294.60 | 1.46E+02 | 71.42 | 6.47E+02 | PB-214 |
| 9 | 328.05 | 323 - | 330 | 327.19 | 4.59E+01 | 47.37 | 3.42E+02 | LA-140 |
| 10 | 338.15 | 333 - | 342 | 337.30 | 1.19E+02 | 58.48 | 4.22E+02 | AC-228 |
| 11 | 351.93 | 346 - | 356 | 351.08 | 3.06E+02 | 68.78 | 4.69E+02 | PB-214 |
| 12 | 463.79 | 459 - | 469 | 462.98 | 4.25E+01 | 47.25 | 2.75E+02 | SB-125 |
| 13 | 510.30 | 504 - | 515 | 509.50 | 1.08E+02 | 55.03 | 3.25E+02 | ..... |
| 14 | 570.58 | 566 - | 574 | 569.80 | 3.08E+01 | 31.74 | 1.38E+02 | BI-207 |
| 15 | 583.10 | 576 - | 587 | 582.33 | 1.76E+02 | 51.69 | 2.46E+02 | TL-208 |
| 16 | 609.47 | 601 - | 616 | 608.72 | 2.30E+02 | 62.83 | 2.98E+02 | BI-214 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|
| 17 | 629.43 | 624 - | 632 | 628.68 | 3.28E+01 | 30.84 | 1.26E+02 | ..... |
| 18 | 727.79 | 720 - | 733 | 727.07 | 6.67E+01 | 43.61 | 1.81E+02 | BI-212 |
| 19 | 784.64 | 781 - | 788 | 783.95 | 3.39E+01 | 24.74 | 7.83E+01 | SB-127 |
| 20 | 861.07 | 856 - | 868 | 860.41 | 2.95E+01 | 36.52 | 1.43E+02 | TL-208 |
| 21 | 911.36 | 906 - | 915 | 910.72 | 9.21E+01 | 28.65 | 6.37E+01 | AC-228 |
| | | | | | | | | TL-204 |
| 22 | 927.09 | 923 - | 929 | 926.46 | 1.75E+01 | 21.28 | 6.90E+01 | ..... |
| 23 | 969.42 | 965 - | 974 | 968.81 | 3.77E+01 | 39.66 | 1.99E+02 | AC-228 |
| 24 | 981.37 | 978 - | 984 | 980.76 | 1.47E+01 | 18.75 | 5.47E+01 | ..... |
| 25 | 1010.45 | 1005 - | 1014 | 1009.86 | 3.40E+01 | 26.38 | 8.00E+01 | ..... |
| 26 | 1107.43 | 1103 - | 1111 | 1106.88 | 3.30E+01 | 25.70 | 8.20E+01 | ..... |
| 27 | 1120.53 | 1116 - | 1124 | 1119.98 | 5.60E+01 | 26.31 | 7.20E+01 | SC-46 |
| | | | | | | | | BI-214 |
| | | | | | | | | TA-182 |
| 28 | 1186.94 | 1184 - | 1189 | 1186.43 | 1.74E+01 | 17.92 | 4.93E+01 | ..... |
| 29 | 1407.84 | 1405 - | 1411 | 1407.44 | 1.02E+01 | 13.18 | 2.36E+01 | EU-152 |
| 30 | 1460.53 | 1455 - | 1467 | 1460.15 | 4.98E+02 | 47.62 | 3.12E+01 | K-40 |
| 31 | 1518.51 | 1514 - | 1523 | 1518.16 | 1.02E+01 | 8.77 | 5.54E+00 | ..... |
| 32 | 1629.10 | 1625 - | 1631 | 1628.81 | 6.67E+00 | 9.21 | 1.07E+01 | ..... |
| 33 | 1696.79 | 1692 - | 1700 | 1696.54 | 7.80E+00 | 7.76 | 4.40E+00 | ..... |
| 34 | 1764.02 | 1759 - | 1767 | 1763.80 | 2.99E+01 | 12.18 | 4.16E+00 | BI-214 |
| 35 | 2040.59 | 2038 - | 2043 | 2040.53 | 5.79E+00 | 6.08 | 2.43E+00 | ..... |
| 36 | 2060.64 | 2057 - | 2063 | 2060.60 | 1.00E+01 | 6.32 | 0.00E+00 | ..... |
| 37 | 2203.30 | 2198 - | 2207 | 2203.34 | 1.57E+01 | 9.85 | 4.56E+00 | BI-214 |
| 38 | 2211.03 | 2208 - | 2214 | 2211.08 | 6.56E+00 | 6.65 | 2.88E+00 | ..... |
| 39 | 2613.65 | 2609 - | 2618 | 2613.96 | 5.50E+01 | 14.83 | 0.00E+00 | ..... |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 1:23:24PM

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 1 | 76.11 | 1.04E+03 | 174.21 | 2.32E-02 | 1.91E-03 |
| 2 | 86.61 | 1.51E+02 | 99.11 | 2.37E-02 | 2.14E-03 |
| 3 | 92.51 | 1.77E+02 | 115.44 | 2.37E-02 | 2.10E-03 |
| 4 | 100.36 | 7.46E+01 | 69.04 | 2.34E-02 | 1.98E-03 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 5 | 186.13 | 1.44E+02 | 75.18 | 1.69E-02 | 1.40E-03 |
| 6 | 239.29 | 8.55E+02 | 95.95 | 1.36E-02 | 1.14E-03 |
| 7 | 273.23 | 1.61E+02 | 88.42 | 1.19E-02 | 9.76E-04 |
| 8 | 295.47 | 1.46E+02 | 71.42 | 1.10E-02 | 9.13E-04 |
| 9 | 328.05 | 4.59E+01 | 47.37 | 9.91E-03 | 8.44E-04 |
| 10 | 338.15 | 1.19E+02 | 58.48 | 9.60E-03 | 8.23E-04 |
| 11 | 351.93 | 3.06E+02 | 68.78 | 9.22E-03 | 7.94E-04 |
| 12 | 463.79 | 4.25E+01 | 47.25 | 6.93E-03 | 6.81E-04 |
| 13 | 510.30 | 1.08E+02 | 55.03 | 6.29E-03 | 6.61E-04 |
| 14 | 570.58 | 3.08E+01 | 31.74 | 5.63E-03 | 6.36E-04 |
| 15 | 583.10 | 1.76E+02 | 51.69 | 5.51E-03 | 6.31E-04 |
| 16 | 609.47 | 2.30E+02 | 62.83 | 5.27E-03 | 6.20E-04 |
| 17 | 629.43 | 3.28E+01 | 30.84 | 5.11E-03 | 6.12E-04 |
| 18 | 727.79 | 6.67E+01 | 43.61 | 4.45E-03 | 5.16E-04 |
| 19 | 784.64 | 3.39E+01 | 24.74 | 4.15E-03 | 4.44E-04 |
| 20 | 861.07 | 2.95E+01 | 36.52 | 3.81E-03 | 3.48E-04 |
| 21 | 911.36 | 9.21E+01 | 28.65 | 3.62E-03 | 2.99E-04 |
| 22 | 927.09 | 1.75E+01 | 21.28 | 3.56E-03 | 2.95E-04 |
| 23 | 969.42 | 3.77E+01 | 39.66 | 3.42E-03 | 2.85E-04 |
| 24 | 981.37 | 1.47E+01 | 18.75 | 3.39E-03 | 2.82E-04 |
| 25 | 1010.45 | 3.40E+01 | 26.38 | 3.30E-03 | 2.76E-04 |
| 26 | 1107.43 | 3.30E+01 | 25.70 | 3.05E-03 | 2.53E-04 |
| 27 | 1120.53 | 5.60E+01 | 26.31 | 3.01E-03 | 2.50E-04 |
| 28 | 1186.94 | 1.74E+01 | 17.92 | 2.87E-03 | 2.37E-04 |
| 29 | 1407.84 | 1.02E+01 | 13.18 | 2.47E-03 | 2.16E-04 |
| 30 | 1460.53 | 4.98E+02 | 47.62 | 2.39E-03 | 2.08E-04 |
| 31 | 1518.51 | 1.02E+01 | 8.77 | 2.30E-03 | 1.99E-04 |
| 32 | 1629.10 | 6.67E+00 | 9.21 | 2.16E-03 | 1.82E-04 |
| 33 | 1696.79 | 7.80E+00 | 7.76 | 2.08E-03 | 1.72E-04 |
| 34 | 1764.02 | 2.99E+01 | 12.18 | 2.00E-03 | 1.62E-04 |
| 35 | 2040.59 | 5.79E+00 | 6.08 | 1.72E-03 | 1.51E-04 |
| 36 | 2060.64 | 1.00E+01 | 6.32 | 1.70E-03 | 1.51E-04 |
| 37 | 2203.30 | 1.57E+01 | 9.85 | 1.58E-03 | 1.51E-04 |
| 38 | 2211.03 | 6.56E+00 | 6.65 | 1.58E-03 | 1.51E-04 |
| 39 | 2613.65 | 5.50E+01 | 14.83 | 1.28E-03 | 1.51E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 1:23:24PM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|
| 1 | 76.11 | 1.04E+03 | 174.21 | 2.66E+01 | 8.34E+00 | 1.02E+03 | 1.74E+02 |
| 2 | 86.61 | 1.51E+02 | 99.11 | | | 1.51E+02 | 9.91E+01 |
| 3 | 92.51 | 1.77E+02 | 115.44 | 5.99E+01 | 8.61E+00 | 1.17E+02 | 1.16E+02 |
| 4 | 100.36 | 7.46E+01 | 69.04 | | | 7.46E+01 | 6.90E+01 |
| 5 | 186.13 | 1.44E+02 | 75.18 | 2.43E+01 | 7.50E+00 | 1.20E+02 | 7.56E+01 |
| 6 | 239.29 | 8.55E+02 | 95.95 | 1.06E+01 | 6.01E+00 | 8.45E+02 | 9.61E+01 |
| 7 | 273.23 | 1.61E+02 | 88.42 | | | 1.61E+02 | 8.84E+01 |
| 8 | 295.47 | 1.46E+02 | 71.42 | | | 1.46E+02 | 7.14E+01 |
| 9 | 328.05 | 4.59E+01 | 47.37 | | | 4.59E+01 | 4.74E+01 |
| 10 | 338.15 | 1.19E+02 | 58.48 | | | 1.19E+02 | 5.85E+01 |
| 11 | 351.93 | 3.06E+02 | 68.78 | | | 3.06E+02 | 6.88E+01 |
| 12 | 463.79 | 4.25E+01 | 47.25 | | | 4.25E+01 | 4.72E+01 |
| 13 | 510.30 | 1.08E+02 | 55.03 | 4.55E+01 | 4.99E+00 | 6.28E+01 | 5.53E+01 |
| 14 | 570.58 | 3.08E+01 | 31.74 | | | 3.08E+01 | 3.17E+01 |
| 15 | 583.10 | 1.76E+02 | 51.69 | | | 1.76E+02 | 5.17E+01 |
| 16 | 609.47 | 2.30E+02 | 62.83 | | | 2.30E+02 | 6.28E+01 |
| 17 | 629.43 | 3.28E+01 | 30.84 | | | 3.28E+01 | 3.08E+01 |
| 18 | 727.79 | 6.67E+01 | 43.61 | | | 6.67E+01 | 4.36E+01 |
| 19 | 784.64 | 3.39E+01 | 24.74 | | | 3.39E+01 | 2.47E+01 |
| 20 | 861.07 | 2.95E+01 | 36.52 | | | 2.95E+01 | 3.65E+01 |
| 21 | 911.36 | 9.21E+01 | 28.65 | | | 9.21E+01 | 2.87E+01 |
| 22 | 927.09 | 1.75E+01 | 21.28 | | | 1.75E+01 | 2.13E+01 |
| 23 | 969.42 | 3.77E+01 | 39.66 | | | 3.77E+01 | 3.97E+01 |
| 24 | 981.37 | 1.47E+01 | 18.75 | | | 1.47E+01 | 1.88E+01 |
| 25 | 1010.45 | 3.40E+01 | 26.38 | | | 3.40E+01 | 2.64E+01 |
| 26 | 1107.43 | 3.30E+01 | 25.70 | | | 3.30E+01 | 2.57E+01 |
| 27 | 1120.53 | 5.60E+01 | 26.31 | | | 5.60E+01 | 2.63E+01 |
| 28 | 1186.94 | 1.74E+01 | 17.92 | | | 1.74E+01 | 1.79E+01 |
| 29 | 1407.84 | 1.02E+01 | 13.18 | | | 1.02E+01 | 1.32E+01 |
| 30 | 1460.53 | 4.98E+02 | 47.62 | | | 4.98E+02 | 4.76E+01 |
| 31 | 1518.51 | 1.02E+01 | 8.77 | | | 1.02E+01 | 8.77E+00 |
| 32 | 1629.10 | 6.67E+00 | 9.21 | | | 6.67E+00 | 9.21E+00 |
| 33 | 1696.79 | 7.80E+00 | 7.76 | | | 7.80E+00 | 7.76E+00 |
| 34 | 1764.02 | 2.99E+01 | 12.18 | | | 2.99E+01 | 1.22E+01 |
| 35 | 2040.59 | 5.79E+00 | 6.08 | | | 5.79E+00 | 6.08E+00 |
| 36 | 2060.64 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| 37 | 2203.30 | 1.57E+01 | 9.85 | | | 1.57E+01 | 9.85E+00 |
| 38 | 2211.03 | 6.56E+00 | 6.65 | | | 6.56E+00 | 6.65E+00 |
| 39 | 2613.65 | 5.50E+01 | 14.83 | | | 5.50E+01 | 1.48E+01 |

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

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 1:23:24PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055576.CNF

Corrected Area is: Original * Peak Ratio - Background

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 1 | 76.11 | 1.04E+03 | 174.21 | 2.66E+01 | 8.34E+00 | 1.02E+03 | 1.74E+02 |
| 2 | 86.61 | 1.51E+02 | 99.11 | | | 1.51E+02 | 9.91E+01 |
| 3 | 92.51 | 1.77E+02 | 115.44 | 5.99E+01 | 8.61E+00 | 1.17E+02 | 1.16E+02 |
| 4 | 100.36 | 7.46E+01 | 69.04 | | | 7.46E+01 | 6.90E+01 |
| 5 | 186.13 | 1.44E+02 | 75.18 | 2.43E+01 | 7.50E+00 | 1.20E+02 | 7.56E+01 |
| 6 | 239.29 | 8.55E+02 | 95.95 | 1.06E+01 | 6.01E+00 | 8.45E+02 | 9.61E+01 |
| 7 | 273.23 | 1.61E+02 | 88.42 | | | 1.61E+02 | 8.84E+01 |
| 8 | 295.47 | 1.46E+02 | 71.42 | | | 1.46E+02 | 7.14E+01 |
| 9 | 328.05 | 4.59E+01 | 47.37 | | | 4.59E+01 | 4.74E+01 |
| 10 | 338.15 | 1.19E+02 | 58.48 | | | 1.19E+02 | 5.85E+01 |
| 11 | 351.93 | 3.06E+02 | 68.78 | | | 3.06E+02 | 6.88E+01 |
| 12 | 463.79 | 4.25E+01 | 47.25 | | | 4.25E+01 | 4.72E+01 |
| 13 | 510.30 | 1.08E+02 | 55.03 | 4.55E+01 | 4.99E+00 | 6.28E+01 | 5.53E+01 |
| 14 | 570.58 | 3.08E+01 | 31.74 | | | 3.08E+01 | 3.17E+01 |
| 15 | 583.10 | 1.76E+02 | 51.69 | | | 1.76E+02 | 5.17E+01 |
| 16 | 609.47 | 2.30E+02 | 62.83 | | | 2.30E+02 | 6.28E+01 |
| 17 | 629.43 | 3.28E+01 | 30.84 | | | 3.28E+01 | 3.08E+01 |
| 18 | 727.79 | 6.67E+01 | 43.61 | | | 6.67E+01 | 4.36E+01 |
| 19 | 784.64 | 3.39E+01 | 24.74 | | | 3.39E+01 | 2.47E+01 |
| 20 | 861.07 | 2.95E+01 | 36.52 | | | 2.95E+01 | 3.65E+01 |
| 21 | 911.36 | 9.21E+01 | 28.65 | | | 9.21E+01 | 2.87E+01 |
| 22 | 927.09 | 1.75E+01 | 21.28 | | | 1.75E+01 | 2.13E+01 |
| 23 | 969.42 | 3.77E+01 | 39.66 | | | 3.77E+01 | 3.97E+01 |
| 24 | 981.37 | 1.47E+01 | 18.75 | | | 1.47E+01 | 1.88E+01 |
| 25 | 1010.45 | 3.40E+01 | 26.38 | | | 3.40E+01 | 2.64E+01 |
| 26 | 1107.43 | 3.30E+01 | 25.70 | | | 3.30E+01 | 2.57E+01 |
| 27 | 1120.53 | 5.60E+01 | 26.31 | | | 5.60E+01 | 2.63E+01 |
| 28 | 1186.94 | 1.74E+01 | 17.92 | | | 1.74E+01 | 1.79E+01 |
| 29 | 1407.84 | 1.02E+01 | 13.18 | | | 1.02E+01 | 1.32E+01 |
| 30 | 1460.53 | 4.98E+02 | 47.62 | | | 4.98E+02 | 4.76E+01 |
| 31 | 1518.51 | 1.02E+01 | 8.77 | | | 1.02E+01 | 8.77E+00 |
| 32 | 1629.10 | 6.67E+00 | 9.21 | | | 6.67E+00 | 9.21E+00 |
| 33 | 1696.79 | 7.80E+00 | 7.76 | | | 7.80E+00 | 7.76E+00 |
| 34 | 1764.02 | 2.99E+01 | 12.18 | | | 2.99E+01 | 1.22E+01 |
| 35 | 2040.59 | 5.79E+00 | 6.08 | | | 5.79E+00 | 6.08E+00 |
| 36 | 2060.64 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| 37 | 2203.30 | 1.57E+01 | 9.85 | | | 1.57E+01 | 9.85E+00 |
| 38 | 2211.03 | 6.56E+00 | 6.65 | | | 6.56E+00 | 6.65E+00 |
| 39 | 2613.65 | 5.50E+01 | 14.83 | | | 5.50E+01 | 1.48E+01 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.987 | 1460.81 | * | 10.67 | 2.43E+01 | 3.18E+00 |
| SN-126 | 0.864 | 87.57 | * | 37.00 | 2.14E-01 | 1.42E-01 |
| EU-155 | 0.361 | 86.50 | * | 30.90 | 2.66E-01 | 1.76E-01 |
| | | 105.30 | | 20.70 | | |
| BI-207 | 0.345 | 569.67 | * | 97.72 | 6.99E-02 | 7.24E-02 |
| | | 1063.62 | | 74.90 | | |
| TL-208 | 0.455 | 583.14 | * | 30.22 | 1.31E+00 | 4.13E-01 |
| | | 860.37 | * | 4.48 | 2.14E+00 | 2.66E+00 |
| | | 2614.66 | | 35.85 | | |
| BI-212 | 0.728 | 727.17 | * | 11.80 | 1.58E+00 | 1.05E+00 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.835 | 238.63 | * | 44.60 | 1.73E+00 | 2.45E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.981 | 609.31 | * | 46.30 | 1.17E+00 | 3.47E-01 |
| | | 1120.29 | * | 15.10 | 1.52E+00 | 7.27E-01 |
| | | 1764.49 | * | 15.80 | 1.17E+00 | 4.87E-01 |
| | | 2204.22 | * | 4.98 | 2.47E+00 | 1.57E+00 |
| PB-214 | 0.996 | 295.21 | * | 19.19 | 8.53E-01 | 4.24E-01 |
| | | 351.92 | * | 37.19 | 1.10E+00 | 2.66E-01 |
| RA-226 | 0.999 | 186.21 | * | 3.28 | 2.67E+00 | 5.17E+00 |
| AC-228 | 0.988 | 338.32 | * | 11.40 | 1.35E+00 | 6.72E-01 |
| | | 911.07 | * | 27.70 | 1.14E+00 | 3.67E-01 |
| | | 969.11 | * | 16.60 | 8.23E-01 | 8.67E-01 |
| NP-237 | 0.998 | 86.50 | * | 12.60 | 6.28E-01 | 4.16E-01 |

* = Energy line found in the spectrum.
- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 1:23:24PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 1 | 76.11 | 2.82164E-01 | 8.59 | | |
| 3 | 92.51 | 3.26001E-02 | 49.32 | | |
| 4 | 100.36 | 2.07144E-02 | 46.29 | Tol. | LU-173 |
| 7 | 273.23 | 4.46902E-02 | 27.48 | Sum | |
| 9 | 328.05 | 1.27407E-02 | 51.64 | Tol. | LA-140 |
| 12 | 463.79 | 1.18056E-02 | 55.59 | Tol. | SB-125 |
| 13 | 510.30 | 1.74514E-02 | 43.97 | | |
| 17 | 629.43 | 9.10880E-03 | 47.02 | | |
| 19 | 784.64 | 9.40639E-03 | 36.53 | Tol. | SB-127 |
| 22 | 927.09 | 4.85577E-03 | 60.88 | | |
| 24 | 981.37 | 4.07407E-03 | 63.94 | | |
| 25 | 1010.45 | 9.44444E-03 | 38.80 | | |
| 26 | 1107.43 | 9.17042E-03 | 38.92 | | |
| 28 | 1186.94 | 4.82143E-03 | 51.61 | | |
| 29 | 1407.84 | 2.83460E-03 | 64.59 | Tol. | EU-152 |
| 31 | 1518.51 | 2.84188E-03 | 42.89 | | |
| 32 | 1629.10 | 1.85185E-03 | 69.04 | | |
| 33 | 1696.79 | 2.16667E-03 | 49.76 | Sum | |
| 35 | 2040.59 | 1.60714E-03 | 52.57 | | |
| 36 | 2060.64 | 2.77778E-03 | 31.62 | | |
| 38 | 2211.03 | 1.82292E-03 | 50.68 | | |
| 39 | 2613.65 | 1.52778E-02 | 13.48 | | |

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

# *NUCLIDE IDENTIFICATION REPORT*

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.98 | 1460.81 | * | 10.67 | 2.43E+01 | 3.18E+00 |
| SN-126 | 0.86 | 87.57 | * | 37.00 | 2.14E-01 | 1.42E-01 |
| EU-155 | 0.36 | 86.50 | * | 30.90 | 2.66E-01 | 1.76E-01 |
| | | 105.30 | | 20.70 | | |
| BI-207 | 0.34 | 569.67 | * | 97.72 | 6.99E-02 | 7.24E-02 |
| | | 1063.62 | | 74.90 | | |
| TL-208 | 0.45 | 583.14 | * | 30.22 | 1.31E+00 | 4.13E-01 |
| | | 860.37 | * | 4.48 | 2.14E+00 | 2.66E+00 |
| | | 2614.66 | | 35.85 | | |
| BI-212 | 0.72 | 727.17 | * | 11.80 | 1.58E+00 | 1.05E+00 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 0.83 | 238.63 | * | 44.60 | 1.73E+00 | 2.45E-01 |
| | | 300.09 | | 3.41 | | |
| BI-214 | 0.98 | 609.31 | * | 46.30 | 1.17E+00 | 3.47E-01 |
| | | 1120.29 | * | 15.10 | 1.52E+00 | 7.27E-01 |
| | | 1764.49 | * | 15.80 | 1.17E+00 | 4.87E-01 |
| | | 2204.22 | * | 4.98 | 2.47E+00 | 1.57E+00 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 8.53E-01 | 4.24E-01 |
| | | 351.92 | * | 37.19 | 1.10E+00 | 2.66E-01 |
| RA-226 | 0.99 | 186.21 | * | 3.28 | 2.67E+00 | 5.17E+00 |
| AC-228 | 0.98 | 338.32 | * | 11.40 | 1.35E+00 | 6.72E-01 |
| | | 911.07 | * | 27.70 | 1.14E+00 | 3.67E-01 |
| | | 969.11 | * | 16.60 | 8.23E-01 | 8.67E-01 |
| NP-237 | 0.99 | 86.50 | * | 12.60 | 6.28E-01 | 4.16E-01 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|
| K-40 | 0.987 | 2.43E+01 | 3.18E+00 | |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| ? | SN-126 | 0.864 | 2.14E-01 | 1.42E-01 | |
| ? | EU-155 | 0.361 | 2.66E-01 | 1.76E-01 | |
| | BI-207 | 0.345 | 6.99E-02 | 7.24E-02 | |
| | TL-208 | 0.455 | 1.33E+00 | 4.08E-01 | |
| | BI-212 | 0.728 | 1.58E+00 | 1.05E+00 | |
| | PB-212 | 0.835 | 1.73E+00 | 2.45E-01 | |
| | BI-214 | 0.981 | 1.25E+00 | 2.60E-01 | |
| | PB-214 | 0.996 | 1.03E+00 | 2.26E-01 | |
| | RA-226 | 0.999 | 2.67E+00 | 5.17E+00 | |
| | AC-228 | 0.988 | 1.14E+00 | 3.02E-01 | |
| ? | NP-237 | 0.998 | 6.28E-01 | 4.16E-01 | |

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 1:23:24PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 1 | 76.11 | 2.82164E-01 | 8.59 | | |
| 3 | 92.51 | 3.26001E-02 | 49.32 | | |
| 4 | 100.36 | 2.07144E-02 | 46.29 | Tol. | LU-173 |
| 7 | 273.23 | 4.46902E-02 | 27.48 | Sum | |
| 9 | 328.05 | 1.27407E-02 | 51.64 | Tol. | LA-140 |
| 12 | 463.79 | 1.18056E-02 | 55.59 | Tol. | SB-125 |
| 13 | 510.30 | 1.74514E-02 | 43.97 | | |
| 17 | 629.43 | 9.10880E-03 | 47.02 | | |
| 19 | 784.64 | 9.40639E-03 | 36.53 | Tol. | SB-127 |
| 22 | 927.09 | 4.85577E-03 | 60.88 | | |
| 24 | 981.37 | 4.07407E-03 | 63.94 | | |
| 25 | 1010.45 | 9.44444E-03 | 38.80 | | |
| 26 | 1107.43 | 9.17042E-03 | 38.92 | | |
| 28 | 1186.94 | 4.82143E-03 | 51.61 | | |
| 29 | 1407.84 | 2.83460E-03 | 64.59 | Tol. | EU-152 |
| 31 | 1518.51 | 2.84188E-03 | 42.89 | | |
| 32 | 1629.10 | 1.85185E-03 | 69.04 | | |
| 33 | 1696.79 | 2.16667E-03 | 49.76 | Sum | |
| 35 | 2040.59 | 1.60714E-03 | 52.57 | | |
| 36 | 2060.64 | 2.77778E-03 | 31.62 | | |
| 38 | 2211.03 | 1.82292E-03 | 50.68 | | |
| 39 | 2613.65 | 1.52778E-02 | 13.48 | | |

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

## *NUCLIDE MDA REPORT*

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| + | | BE-7 | 477.59 | | 10.42 | 2.56E-01 | 3.08E+00 | 3.08E+00 |
| + | | NA-22 | 1274.54 | | 99.94 | 6.63E-02 | 1.81E-01 | 1.81E-01 |
| + | @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | | AL-26 | 1808.65 | | 99.76 | 1.43E-02 | 1.01E-01 | 1.01E-01 |
| + | | K-40 | 1460.81 | * | 10.67 | 2.43E+01 | 1.46E+00 | 1.46E+00 |
| + | @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | TI-44 | 67.88 | | 94.40 | -4.97E-02 | 8.29E-02 | 8.29E-02 |
| | | | 78.34 | | 96.00 | 4.40E-01 | | 1.08E-01 |
| + | | SC-46 | 889.25 | | 99.98 | -2.33E-01 | 2.50E-01 | 2.50E-01 |
| | | | 1120.51 | | 99.99 | 3.71E-01 | | 4.42E-01 |
| + | | V-48 | 983.52 | | 99.98 | 0.00E+00 | 1.05E+01 | 1.05E+01 |
| | | | 1312.10 | | 97.50 | -1.06E+00 | | 1.12E+01 |
| + | | CR-51 | 320.08 | | 9.83 | 3.80E-01 | 9.10E+00 | 9.10E+00 |
| + | | MN-54 | 834.83 | | 99.97 | -5.91E-03 | 1.70E-01 | 1.70E-01 |
| + | | CO-56 | 846.75 | | 99.96 | 1.19E-01 | 3.13E-01 | 3.13E-01 |
| | | | 1037.75 | | 14.03 | 1.28E+00 | | 2.56E+00 |
| | | | 1238.25 | | 67.00 | 3.03E-01 | | 7.32E-01 |
| | | | 1771.40 | | 15.51 | -1.39E-01 | | 1.03E+00 |
| | | | 2598.48 | | 16.90 | 2.72E-01 | | 1.26E+00 |
| + | | CO-57 | 122.06 | | 85.51 | -2.10E-02 | 9.03E-02 | 9.03E-02 |
| | | | 136.48 | | 10.60 | -2.75E-01 | | 7.64E-01 |
| + | | CO-58 | 810.76 | | 99.40 | 1.80E-01 | 3.54E-01 | 3.54E-01 |
| + | | FE-59 | 1099.22 | | 56.50 | 1.25E-01 | 1.20E+00 | 1.20E+00 |
| | | | 1291.56 | | 43.20 | 2.30E-01 | | 1.66E+00 |
| + | | CO-60 | 1173.22 | | 100.00 | 1.54E-02 | 1.44E-01 | 1.78E-01 |
| | | | 1332.49 | | 100.00 | -3.43E-02 | | 1.44E-01 |
| + | | ZN-65 | 1115.52 | | 50.75 | -3.89E-02 | 4.39E-01 | 4.39E-01 |
| + | | GA-67 | 93.31 | | 35.70 | 4.83E+08 | 3.16E+08 | 3.16E+08 |
| | | | 208.95 | | 2.24 | 2.12E+09 | | 5.04E+09 |
| | | | 300.22 | | 16.00 | 1.55E+08 | | 8.17E+08 |
| + | | SE-75 | 121.11 | | 16.70 | -7.40E-01 | 1.91E-01 | 6.12E-01 |
| | | | 136.00 | | 59.20 | 2.41E-02 | | 1.91E-01 |
| | | | 264.65 | | 59.80 | 1.08E-02 | | 2.11E-01 |
| | | | 279.53 | | 25.20 | -5.09E-02 | | 5.21E-01 |
| | | | 400.65 | | 11.40 | 6.56E-02 | | 1.31E+00 |
| + | | RB-82 | 776.52 | | 13.00 | 2.24E-01 | 1.42E+01 | 1.42E+01 |
| + | | RB-83 | 520.41 | | 46.00 | 2.15E-02 | 4.35E-01 | 4.35E-01 |
| | | | 529.64 | | 30.30 | -1.29E-02 | | 6.69E-01 |
| | | | 552.65 | | 16.40 | 5.64E-01 | | 1.42E+00 |
| + | | KR-85 | 513.99 | | 0.43 | 1.28E+01 | 2.89E+01 | 2.89E+01 |
| + | | SR-85 | 513.99 | | 99.27 | 1.58E-01 | 3.59E-01 | 3.59E-01 |
| + | | Y-88 | 898.02 | | 93.40 | 2.17E-01 | 1.86E-01 | 2.95E-01 |
| | | | 1836.01 | | 99.38 | -2.30E-02 | | 1.86E-01 |
| + | | MO-93 | 263.06 | | 56.72 | 1.16E-02 | 8.55E-02 | 1.32E-01 |
| | | | 684.67 | | 99.68 | -5.55E-02 | | 1.17E-01 |
| | | | 1477.11 | | 99.08 | -1.53E-02 | | 8.55E-02 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | NB-93M | 16.57 | | 9.43 | 1.49E+01 | 8.29E+00 | 8.29E+00 |
| + | NB-94 | 702.63 | | 100.00 | -1.01E-02 | 1.24E-01 | 1.28E-01 |
| | | 871.10 | | 100.00 | 2.76E-02 | | 1.24E-01 |
| + | NB-95 | 765.79 | | 99.81 | -7.76E-02 | 9.56E-01 | 9.56E-01 |
| + | NB-95M | 235.69 | | 25.00 | 6.22E+06 | 9.15E+07 | 9.15E+07 |
| + | ZR-95 | 724.18 | | 43.70 | 1.39E-01 | 6.98E-01 | 9.37E-01 |
| | | 756.72 | | 55.30 | 1.93E-01 | | 6.98E-01 |
| + | MO-99 | 181.06 | | 6.20 | 2.39E+10 | 6.24E+10 | 7.85E+10 |
| | | 739.58 | | 12.80 | -3.58E+10 | | 6.24E+10 |
| | | 778.00 | | 4.50 | -4.05E+10 | | 1.95E+11 |
| + | RU-103 | 497.08 | | 89.00 | -4.47E-01 | 5.36E-01 | 5.36E-01 |
| + | RU-106 | 621.84 | | 9.80 | 6.21E-02 | 1.19E+00 | 1.19E+00 |
| + | AG-108M | 433.93 | | 89.90 | -2.89E-03 | 9.49E-02 | 9.49E-02 |
| | | 614.37 | | 90.40 | -2.73E-01 | | 1.18E-01 |
| | | 722.95 | | 90.50 | 1.33E-02 | | 1.44E-01 |
| + | CD-109 | 88.03 | | 3.72 | 8.80E-01 | 2.51E+00 | 2.51E+00 |
| + | AG-110M | 657.75 | | 93.14 | -6.34E-02 | 1.59E-01 | 1.59E-01 |
| | | 677.61 | | 10.53 | 5.12E-01 | | 1.44E+00 |
| | | 706.67 | | 16.46 | -2.27E-01 | | 1.01E+00 |
| | | 763.93 | | 21.98 | -6.71E-02 | | 8.05E-01 |
| | | 884.67 | | 71.63 | 5.40E-02 | | 2.18E-01 |
| | | 1384.27 | | 23.94 | 9.48E-02 | | 7.07E-01 |
| + | CD-113M | 263.70 | | 0.02 | 1.03E+01 | 3.17E+02 | 3.17E+02 |
| + | SN-113 | 255.12 | | 1.93 | 2.44E+00 | 2.40E-01 | 7.01E+00 |
| | | 391.69 | | 64.90 | -1.26E-02 | | 2.40E-01 |
| + | TE123M | 159.00 | | 84.10 | -3.00E-02 | 1.37E-01 | 1.37E-01 |
| + | SB-124 | 602.71 | | 97.87 | 2.73E-02 | 3.30E-01 | 3.30E-01 |
| | | 645.85 | | 7.26 | -1.14E+00 | | 4.53E+00 |
| | | 722.78 | | 11.10 | 3.39E-01 | | 3.68E+00 |
| | | 1691.02 | | 49.00 | -1.02E-01 | | 4.58E-01 |
| + | I-125 | 35.49 | | 6.49 | -5.62E-01 | 5.62E+00 | 5.62E+00 |
| + | SB-125 | 176.33 | | 6.89 | 8.69E-02 | 3.15E-01 | 1.03E+00 |
| | | 427.89 | | 29.33 | 1.59E-02 | | 3.15E-01 |
| | | 463.38 | | 10.35 | 8.40E-01 | | 1.04E+00 |
| | | 600.56 | | 17.80 | 1.09E-01 | | 6.49E-01 |
| | | 635.90 | | 11.32 | 3.24E-01 | | 9.96E-01 |
| + | SB-126 | 414.70 | | 83.30 | 3.62E+00 | 2.73E+01 | 2.73E+01 |
| | | 666.33 | | 99.60 | 6.22E+00 | | 3.13E+01 |
| | | 695.00 | | 99.60 | -2.60E+01 | | 3.09E+01 |
| | | 720.50 | | 53.80 | 1.00E+01 | | 5.61E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 2.14E-01 | 2.27E-01 | 2.27E-01 |
| + | SB-127 | 473.00 | | 25.00 | 9.21E+06 | 1.86E+07 | 2.13E+07 |
| | | 685.20 | | 35.70 | -8.85E+06 | | 1.86E+07 |
| | | 783.80 | | 14.70 | -3.49E+06 | | 5.29E+07 |
| + | I-129 | 29.78 | | 57.00 | 3.85E-02 | 2.94E-01 | 2.94E-01 |
| | | 33.60 | | 13.20 | -3.75E-01 | | 9.63E-01 |
| | | 39.58 | | 7.52 | -3.83E-01 | | 1.32E+00 |
| + | I-131 | 284.30 | | 6.05 | 9.10E+02 | 4.83E+02 | 6.18E+03 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | | I-131 | 364.48 | 81.20 | -4.07E+01 | 4.83E+02 | 4.83E+02 |
| | | | 636.97 | 7.26 | 2.03E+03 | | 7.82E+03 |
| | | | 722.89 | 1.80 | 3.48E+03 | | 3.78E+04 |
| + | | TE-132 | 49.72 | 13.10 | 1.62E+08 | 1.23E+08 | 9.71E+08 |
| | | | 228.16 | 88.00 | -4.14E+07 | | 1.23E+08 |
| + | | BA-133 | 81.00 | 33.00 | -6.36E-01 | 1.76E-01 | 2.50E-01 |
| | | | 302.84 | 17.80 | -5.25E-02 | | 4.71E-01 |
| | | | 356.01 | 60.00 | -3.55E-03 | | 1.76E-01 |
| + | @ | I-133 | 529.87 | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | | XE-133 | 81.00 | 38.00 | -2.73E+05 | 1.07E+05 | 1.07E+05 |
| + | | CS-134 | 563.23 | 8.38 | 2.42E-01 | 1.33E-01 | 1.26E+00 |
| | | | 569.32 | 15.43 | 5.07E-01 | | 7.12E-01 |
| | | | 604.70 | 97.60 | -5.57E-01 | | 1.33E-01 |
| | | | 795.84 | 85.40 | 1.07E-01 | | 1.76E-01 |
| | | | 801.93 | 8.73 | -2.82E-01 | | 1.59E+00 |
| + | | CS-135 | 268.24 | 16.00 | -1.59E-01 | 4.85E-01 | 4.85E-01 |
| + | @ | I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | | CS-136 | 153.22 | 7.46 | -6.57E+01 | 2.32E+01 | 1.61E+02 |
| | | | 163.89 | 4.61 | 7.92E+01 | | 2.64E+02 |
| | | | 176.55 | 13.56 | 1.86E+01 | | 9.19E+01 |
| | | | 273.65 | 12.66 | 2.34E+01 | | 1.23E+02 |
| | | | 340.57 | 48.50 | 4.67E+01 | | 3.84E+01 |
| | | | 818.50 | 99.70 | -3.57E+00 | | 2.32E+01 |
| | | | 1048.07 | 79.60 | 9.78E+00 | | 3.52E+01 |
| | | | 1235.34 | 19.70 | 9.33E+01 | | 2.01E+02 |
| + | | CS-137 | 661.65 | 85.12 | 1.23E-01 | 1.39E-01 | 1.39E-01 |
| + | | LA-138 | 788.74 | 34.00 | -1.49E-01 | 1.74E-01 | 3.63E-01 |
| | | | 1435.80 | 66.00 | -2.20E-02 | | 1.74E-01 |
| + | | CE-139 | 165.85 | 80.35 | 1.56E-02 | 1.35E-01 | 1.35E-01 |
| + | | BA-140 | 162.64 | 6.70 | 1.01E+02 | 8.63E+01 | 2.13E+02 |
| | | | 304.84 | 4.50 | 1.00E+02 | | 3.92E+02 |
| | | | 423.70 | 3.20 | -5.59E+01 | | 6.06E+02 |
| | | | 437.55 | 2.00 | -1.06E+02 | | 9.30E+02 |
| | | | 537.32 | 25.00 | 9.71E+00 | | 8.63E+01 |
| + | | LA-140 | 328.77 | 20.50 | 5.84E+01 | 3.39E+01 | 8.97E+01 |
| | | | 487.03 | 45.50 | 2.40E+00 | | 4.16E+01 |
| | | | 815.85 | 23.50 | -2.38E+01 | | 1.12E+02 |
| | | | 1596.49 | 95.49 | 1.46E+01 | | 3.39E+01 |
| + | | CE-141 | 145.44 | 48.40 | 4.80E-01 | 1.11E+00 | 1.11E+00 |
| + | @ | CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | | CE-144 | 133.54 | 10.80 | -2.96E-01 | 7.54E-01 | 7.54E-01 |
| + | | PM-144 | 476.78 | 42.00 | 8.47E-02 | 1.28E-01 | 2.59E-01 |
| | | | 618.01 | 98.60 | 3.70E-02 | | 1.28E-01 |
| | | | 696.49 | 99.49 | 9.19E-02 | | 1.57E-01 |
| + | | PM-145 | 36.85 | 21.70 | -5.89E-02 | 2.70E-01 | 5.06E-01 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | PM-145 | 37.36 | | 39.70 | -3.14E-02 | 2.70E-01 | 2.70E-01 |
| | | 42.30 | | 15.10 | -5.77E-01 | | 6.16E-01 |
| | | 72.40 | | 2.31 | -3.71E-02 | | 3.94E+00 |
| + | PM-146 | 453.90 | | 39.94 | -1.10E-01 | 2.22E-01 | 2.22E-01 |
| | | 735.90 | | 14.01 | 3.80E-03 | | 8.18E-01 |
| | | 747.13 | | 13.10 | 3.30E-01 | | 1.00E+00 |
| + | ND-147 | 91.11 | | 28.90 | 1.92E+02 | 1.48E+02 | 1.48E+02 |
| | | 531.02 | | 13.10 | 1.05E+02 | | 3.81E+02 |
| + | PM-149 | 285.90 | | 3.10 | 1.34E+12 | 7.75E+13 | 7.75E+13 |
| + | EU-152 | 121.78 | | 20.50 | -6.88E-02 | 2.96E-01 | 2.96E-01 |
| | | 244.69 | | 5.40 | -2.45E-02 | | 1.55E+00 |
| | | 344.27 | | 19.13 | 3.48E-02 | | 4.06E-01 |
| | | 778.89 | | 9.20 | -9.91E-02 | | 1.35E+00 |
| | | 964.01 | | 10.40 | 3.56E-01 | | 1.58E+00 |
| | | 1085.78 | | 7.22 | 4.17E-01 | | 2.04E+00 |
| | | 1112.02 | | 9.60 | -1.57E-01 | | 1.83E+00 |
| | | 1407.95 | | 14.94 | 3.00E-01 | | 9.47E-01 |
| + | GD-153 | 97.43 | | 31.30 | -3.72E-01 | 2.78E-01 | 2.78E-01 |
| | | 103.18 | | 22.20 | 6.75E-02 | | 3.76E-01 |
| + | EU-154 | 123.07 | | 40.50 | 4.21E-02 | 1.54E-01 | 1.54E-01 |
| | | 723.30 | | 19.70 | 1.08E-01 | | 7.24E-01 |
| | | 873.19 | | 11.50 | 5.70E-02 | | 1.12E+00 |
| | | 996.32 | | 10.30 | 9.89E-01 | | 1.60E+00 |
| | | 1004.76 | | 17.90 | 1.63E-01 | | 8.32E-01 |
| | | 1274.45 | | 35.50 | 1.77E-01 | | 4.84E-01 |
| + | EU-155 | 86.50 | * | 30.90 | 2.66E-01 | 2.83E-01 | 2.83E-01 |
| | | 105.30 | | 20.70 | 1.37E-01 | | 3.08E-01 |
| + | EU-156 | 811.77 | | 10.40 | 2.79E+01 | 1.16E+02 | 1.16E+02 |
| | | 1153.47 | | 7.20 | 1.56E+02 | | 2.37E+02 |
| | | 1230.71 | | 8.90 | -2.39E+01 | | 2.08E+02 |
| + | HO-166M | 184.41 | | 72.60 | 1.33E-01 | 1.08E-01 | 1.08E-01 |
| | | 280.45 | | 29.60 | -3.11E-02 | | 2.39E-01 |
| | | 410.94 | | 11.10 | 4.49E-01 | | 8.35E-01 |
| | | 711.69 | | 54.10 | 5.00E-02 | | 2.35E-01 |
| + | TM-171 | 66.72 | | 0.14 | -4.71E+01 | 6.23E+01 | 6.23E+01 |
| + | HF-172 | 67.35 | | 5.31 | -1.24E+00 | 6.30E-01 | 1.64E+00 |
| | | 125.81 | | 11.30 | 5.50E-02 | | 6.30E-01 |
| + | LU-172 | 181.53 | | 20.60 | 2.45E+03 | 6.63E+03 | 9.55E+03 |
| | | 900.72 | | 29.81 | 4.66E+03 | | 1.36E+04 |
| | | 1093.66 | | 62.50 | -1.98E+03 | | 6.63E+03 |
| + | LU-173 | 100.72 | | 5.24 | 1.86E-02 | 4.55E-01 | 1.36E+00 |
| | | 272.11 | | 21.20 | 3.07E-01 | | 4.55E-01 |
| + | HF-175 | 343.40 | | 84.00 | 2.09E-02 | 2.43E-01 | 2.43E-01 |
| + | LU-176 | 88.34 | | 13.30 | 2.12E-01 | 8.22E-02 | 6.05E-01 |
| | | 201.83 | | 86.00 | 2.39E-02 | | 8.49E-02 |
| | | 306.78 | | 94.00 | -5.87E-02 | | 8.22E-02 |
| + | HF-181 | 133.02 | | 41.70 | 2.11E-01 | 4.77E-01 | 8.03E-01 |
| | | 345.85 | | 17.20 | 1.95E-01 | | 2.27E+00 |
| | | 482.03 | | 82.80 | -3.78E-01 | | 4.77E-01 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | TA-182 | 67.75 | | 41.20 | -2.07E-01 | 3.46E-01 | 3.46E-01 |
| | | 1121.30 | | 34.90 | 8.82E-01 | | 1.02E+00 |
| | | 1189.05 | | 16.23 | 2.01E-01 | | 1.92E+00 |
| | | 1221.41 | | 26.98 | 2.40E-01 | | 1.28E+00 |
| | | 1231.02 | | 11.44 | -4.98E-01 | | 3.25E+00 |
| + | IR-192 | 308.46 | | 29.68 | 3.32E-01 | 4.72E-01 | 6.85E-01 |
| | | 468.07 | | 48.10 | -1.81E-01 | | 4.72E-01 |
| + | HG-203 | 279.19 | | 77.30 | -2.71E-02 | 4.23E-01 | 4.23E-01 |
| + | TL-204 | 374.74 | | 94.11 | 8.55E-03 | 8.83E-02 | 8.83E-02 |
| | | 899.15 | | 99.16 | -2.87E-02 | | 1.44E-01 |
| | | 911.74 | | 91.10 | 3.36E-01 | | 2.13E-01 |
| + | BI-207 | 569.67 | * | 97.72 | 6.99E-02 | 1.17E-01 | 1.17E-01 |
| | | 1063.62 | | 74.90 | 7.37E-02 | | 2.03E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 1.31E+00 | 5.64E-01 | 5.64E-01 |
| | | 860.37 | * | 4.48 | 2.14E+00 | | 4.36E+00 |
| | | 2614.66 | | 35.85 | 1.32E+00 | | 9.88E-01 |
| + | BI-210M | 262.00 | | 45.00 | -2.59E-02 | 1.61E-01 | 1.61E-01 |
| | | 300.00 | | 23.00 | 7.36E-02 | | 3.87E-01 |
| + | PB-210 | 46.50 | | 4.25 | 5.43E-01 | 2.14E+00 | 2.14E+00 |
| + | PB-211 | 404.84 | | 2.90 | -4.30E-01 | 2.90E+00 | 2.90E+00 |
| | | 831.96 | | 2.90 | 8.30E-02 | | 4.71E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 1.58E+00 | 1.63E+00 | 1.63E+00 |
| | | 1620.62 | | 2.75 | -1.45E-01 | | 3.62E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.73E+00 | 2.64E-01 | 2.64E-01 |
| | | 300.09 | | 3.41 | 4.97E-01 | | 2.61E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 1.17E+00 | 4.51E-01 | 4.73E-01 |
| | | 1120.29 | * | 15.10 | 1.52E+00 | | 1.04E+00 |
| | | 1764.49 | * | 15.80 | 1.17E+00 | | 4.51E-01 |
| | | 2204.22 | * | 4.98 | 2.47E+00 | | 1.94E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 8.53E-01 | 3.62E-01 | 6.64E-01 |
| | | 351.92 | * | 37.19 | 1.10E+00 | | 3.62E-01 |
| + | RN-219 | 401.80 | | 6.50 | -2.09E-01 | 1.27E+00 | 1.27E+00 |
| + | RA-223 | 323.87 | | 3.88 | -4.77E-02 | 2.03E+00 | 2.03E+00 |
| + | RA-224 | 240.98 | | 3.95 | 1.83E+01 | 3.61E+00 | 3.61E+00 |
| + | RA-225 | 40.00 | | 31.00 | -9.55E+00 | 3.29E+01 | 3.29E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.67E+00 | 2.72E+00 | 2.72E+00 |
| + | TH-227 | 50.10 | | 8.40 | 1.68E-01 | 1.01E+00 | 1.01E+00 |
| | | 236.00 | | 11.50 | 7.10E-02 | | 1.04E+00 |
| | | 256.20 | | 6.30 | 2.98E-01 | | 1.18E+00 |
| + | AC-228 | 338.32 | * | 11.40 | 1.35E+00 | 4.66E-01 | 1.04E+00 |
| | | 911.07 | * | 27.70 | 1.14E+00 | | 4.66E-01 |
| | | 969.11 | * | 16.60 | 8.23E-01 | | 1.41E+00 |
| + | TH-230 | 48.44 | | 16.90 | 1.09E-01 | 5.13E-01 | 5.13E-01 |
| | | 62.85 | | 4.60 | -3.65E-01 | | 1.78E+00 |
| | | 67.67 | | 0.37 | -1.26E+01 | | 2.11E+01 |
| + | PA-231 | 283.67 | | 1.60 | 6.58E-01 | 3.58E+00 | 4.46E+00 |
| | | 302.67 | | 2.30 | -3.99E-01 | | 3.58E+00 |
| + | TH-231 | 25.64 | | 14.70 | 4.40E-01 | 1.17E+00 | 1.70E+00 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | TH-231 | 84.21 | | 6.40 | -9.78E-01 | 1.17E+00 | 1.17E+00 |
| + | PA-233 | 311.98 | | 38.60 | 5.56E-01 | 2.55E+00 | 2.55E+00 |
| + | PA-234 | 131.20 | | 20.40 | 1.35E-01 | 3.27E-01 | 3.27E-01 |
| | | 733.99 | | 8.80 | 1.36E-01 | | 1.37E+00 |
| | | 946.00 | | 12.00 | -3.65E-01 | | 1.11E+00 |
| + | PA-234M | 1001.03 | | 0.92 | -7.73E-01 | 1.64E+01 | 1.64E+01 |
| + | TH-234 | 63.29 | | 3.80 | -4.40E-01 | 2.14E+00 | 2.14E+00 |
| + | U-235 | 143.76 | | 10.50 | 2.42E-01 | 6.21E-01 | 6.21E-01 |
| | | 163.35 | | 4.70 | 6.62E-01 | | 1.40E+00 |
| | | 205.31 | | 4.70 | -1.11E+00 | | 1.56E+00 |
| + | NP-237 | 86.50 | * | 12.60 | 6.28E-01 | 6.67E-01 | 6.67E-01 |
| + | NP-239 | 106.10 | | 22.70 | 1.59E+11 | 1.31E+12 | 1.31E+12 |
| | | 228.18 | | 10.70 | -1.12E+12 | | 3.35E+12 |
| | | 277.60 | | 14.10 | 3.88E+11 | | 2.62E+12 |
| + | AM-241 | 59.54 | | 35.90 | 1.83E-01 | 2.38E-01 | 2.38E-01 |
| + | AM-243 | 74.67 | | 66.00 | 7.57E-01 | 1.65E-01 | 1.65E-01 |
| + | CM-243 | 209.75 | | 3.29 | 1.32E+00 | 5.39E-01 | 2.35E+00 |
| | | 228.14 | | 10.60 | -2.32E-01 | | 6.90E-01 |
| | | 277.60 | | 14.00 | 7.98E-02 | | 5.39E-01 |

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | 10.42 | 3.08E+00 | 3.08E+00 | 2.56E-01 | 1.45E+00 |
| | NA-22 | 1274.54 | 99.94 | 1.81E-01 | 1.81E-01 | 6.63E-02 | 8.38E-02 |
| @ | NA-24 | 1368.53 | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| @ | NA-24 | 2754.09 | | 99.86 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 1.01E-01 | 1.01E-01 | 1.43E-02 | 4.19E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 1.46E+00 | 1.46E+00 | 2.43E+01 | 6.62E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 8.29E-02 | 8.29E-02 | -4.97E-02 | 4.06E-02 |
| | | 78.34 | | 96.00 | 1.08E-01 | | 4.40E-01 | 5.35E-02 |
| | SC-46 | 889.25 | | 99.98 | 2.50E-01 | 2.50E-01 | -2.33E-01 | 1.15E-01 |
| | | 1120.51 | | 99.99 | 4.42E-01 | | 3.71E-01 | 2.09E-01 |
| | V-48 | 983.52 | | 99.98 | 1.05E+01 | 1.05E+01 | 0.00E+00 | 4.87E+00 |
| | | 1312.10 | | 97.50 | 1.12E+01 | | -1.06E+00 | 5.10E+00 |
| | CR-51 | 320.08 | | 9.83 | 9.10E+00 | 9.10E+00 | 3.80E-01 | 4.35E+00 |
| | MN-54 | 834.83 | | 99.97 | 1.70E-01 | 1.70E-01 | -5.91E-03 | 7.94E-02 |
| | CO-56 | 846.75 | | 99.96 | 3.13E-01 | 3.13E-01 | 1.19E-01 | 1.46E-01 |
| | | 1037.75 | | 14.03 | 2.56E+00 | | 1.28E+00 | 1.19E+00 |
| | | 1238.25 | | 67.00 | 7.32E-01 | | 3.03E-01 | 3.44E-01 |
| | | 1771.40 | | 15.51 | 1.03E+00 | | -1.39E-01 | 3.87E-01 |
| | | 2598.48 | | 16.90 | 1.26E+00 | | 2.72E-01 | 4.48E-01 |
| | CO-57 | 122.06 | | 85.51 | 9.03E-02 | 9.03E-02 | -2.10E-02 | 4.40E-02 |
| | | 136.48 | | 10.60 | 7.64E-01 | | -2.75E-01 | 3.72E-01 |
| | CO-58 | 810.76 | | 99.40 | 3.54E-01 | 3.54E-01 | 1.80E-01 | 1.66E-01 |
| | FE-59 | 1099.22 | | 56.50 | 1.20E+00 | 1.20E+00 | 1.25E-01 | 5.56E-01 |
| | | 1291.56 | | 43.20 | 1.66E+00 | | 2.30E-01 | 7.60E-01 |
| | CO-60 | 1173.22 | | 100.00 | 1.78E-01 | 1.44E-01 | 1.54E-02 | 8.32E-02 |
| | | 1332.49 | | 100.00 | 1.44E-01 | | -3.43E-02 | 6.53E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 4.39E-01 | 4.39E-01 | -3.89E-02 | 2.05E-01 |
| | GA-67 | 93.31 | | 35.70 | 3.16E+08 | 3.16E+08 | 4.83E+08 | 1.55E+08 |
| | | 208.95 | | 2.24 | 5.04E+09 | | 2.12E+09 | 2.45E+09 |
| | | 300.22 | | 16.00 | 8.17E+08 | | 1.55E+08 | 3.94E+08 |
| | SE-75 | 121.11 | | 16.70 | 6.12E-01 | 1.91E-01 | -7.40E-01 | 2.98E-01 |
| | | 136.00 | | 59.20 | 1.91E-01 | | 2.41E-02 | 9.31E-02 |
| | | 264.65 | | 59.80 | 2.11E-01 | | 1.08E-02 | 1.02E-01 |
| | | 279.53 | | 25.20 | 5.21E-01 | | -5.09E-02 | 2.50E-01 |
| | | 400.65 | | 11.40 | 1.31E+00 | | 6.56E-02 | 6.21E-01 |
| | RB-82 | 776.52 | | 13.00 | 1.42E+01 | 1.42E+01 | 2.24E-01 | 6.65E+00 |
| | RB-83 | 520.41 | | 46.00 | 4.35E-01 | 4.35E-01 | 2.15E-02 | 2.04E-01 |
| | | 529.64 | | 30.30 | 6.69E-01 | | -1.29E-02 | 3.14E-01 |
| | | 552.65 | | 16.40 | 1.42E+00 | | 5.64E-01 | 6.69E-01 |
| | KR-85 | 513.99 | | 0.43 | 2.89E+01 | 2.89E+01 | 1.28E+01 | 1.38E+01 |
| | SR-85 | 513.99 | | 99.27 | 3.59E-01 | 3.59E-01 | 1.58E-01 | 1.72E-01 |
| | Y-88 | 898.02 | | 93.40 | 2.95E-01 | 1.86E-01 | 2.17E-01 | 1.38E-01 |
| | | 1836.01 | | 99.38 | 1.86E-01 | | -2.30E-02 | 7.62E-02 |
| | MO-93 | 263.06 | | 56.72 | 1.32E-01 | 8.55E-02 | 1.16E-02 | 6.35E-02 |
| | | 684.67 | | 99.68 | 1.17E-01 | | -5.55E-02 | 5.48E-02 |
| | | 1477.11 | | 99.08 | 8.55E-02 | | -1.53E-02 | 3.55E-02 |
| | NB-93M | 16.57 | | 9.43 | 8.29E+00 | 8.29E+00 | 1.49E+01 | 4.03E+00 |
| | NB-94 | 702.63 | | 100.00 | 1.28E-01 | 1.24E-01 | -1.01E-02 | 6.05E-02 |
| | | 871.10 | | 100.00 | 1.24E-01 | | 2.76E-02 | 5.77E-02 |
| | NB-95 | 765.79 | | 99.81 | 9.56E-01 | 9.56E-01 | -7.76E-02 | 4.50E-01 |
| | NB-95M | 235.69 | | 25.00 | 9.15E+07 | 9.15E+07 | 6.22E+06 | 4.48E+07 |
| | ZR-95 | 724.18 | | 43.70 | 9.37E-01 | 6.98E-01 | 1.39E-01 | 4.43E-01 |
| | | 756.72 | | 55.30 | 6.98E-01 | | 1.93E-01 | 3.28E-01 |
| | MO-99 | 181.06 | | 6.20 | 7.85E+10 | 6.24E+10 | 2.39E+10 | 3.81E+10 |
| | | 739.58 | | 12.80 | 6.24E+10 | | -3.58E+10 | 2.90E+10 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | MO-99 | 778.00 | | 4.50 | 1.95E+11 | 6.24E+10 | -4.05E+10 | 9.08E+10 |
| | RU-103 | 497.08 | | 89.00 | 5.36E-01 | 5.36E-01 | -4.47E-01 | 2.51E-01 |
| | RU-106 | 621.84 | | 9.80 | 1.19E+00 | 1.19E+00 | 6.21E-02 | 5.53E-01 |
| | AG-108M | 433.93 | | 89.90 | 9.49E-02 | 9.49E-02 | -2.89E-03 | 4.50E-02 |
| | | 614.37 | | 90.40 | 1.18E-01 | | -2.73E-01 | 5.56E-02 |
| | | 722.95 | | 90.50 | 1.44E-01 | | 1.33E-02 | 6.80E-02 |
| | CD-109 | 88.03 | | 3.72 | 2.51E+00 | 2.51E+00 | 8.80E-01 | 1.23E+00 |
| | AG-110M | 657.75 | | 93.14 | 1.59E-01 | 1.59E-01 | -6.34E-02 | 7.45E-02 |
| | | 677.61 | | 10.53 | 1.44E+00 | | 5.12E-01 | 6.73E-01 |
| | | 706.67 | | 16.46 | 1.01E+00 | | -2.27E-01 | 4.76E-01 |
| | | 763.93 | | 21.98 | 8.05E-01 | | -6.71E-02 | 3.79E-01 |
| | | 884.67 | | 71.63 | 2.18E-01 | | 5.40E-02 | 1.01E-01 |
| | | 1384.27 | | 23.94 | 7.07E-01 | | 9.48E-02 | 3.17E-01 |
| | CD-113M | 263.70 | | 0.02 | 3.17E+02 | 3.17E+02 | 1.03E+01 | 1.52E+02 |
| | SN-113 | 255.12 | | 1.93 | 7.01E+00 | 2.40E-01 | 2.44E+00 | 3.38E+00 |
| | | 391.69 | | 64.90 | 2.40E-01 | | -1.26E-02 | 1.14E-01 |
| | TE123M | 159.00 | | 84.10 | 1.37E-01 | 1.37E-01 | -3.00E-02 | 6.65E-02 |
| | SB-124 | 602.71 | | 97.87 | 3.30E-01 | 3.30E-01 | 2.73E-02 | 1.55E-01 |
| | | 645.85 | | 7.26 | 4.53E+00 | | -1.14E+00 | 2.12E+00 |
| | | 722.78 | | 11.10 | 3.68E+00 | | 3.39E-01 | 1.74E+00 |
| | | 1691.02 | | 49.00 | 4.58E-01 | | -1.02E-01 | 1.77E-01 |
| | I-125 | 35.49 | | 6.49 | 5.62E+00 | 5.62E+00 | -5.62E-01 | 2.74E+00 |
| | SB-125 | 176.33 | | 6.89 | 1.03E+00 | 3.15E-01 | 8.69E-02 | 5.00E-01 |
| | | 427.89 | | 29.33 | 3.15E-01 | | 1.59E-02 | 1.49E-01 |
| | | 463.38 | | 10.35 | 1.04E+00 | | 8.40E-01 | 4.95E-01 |
| | | 600.56 | | 17.80 | 6.49E-01 | | 1.09E-01 | 3.06E-01 |
| | | 635.90 | | 11.32 | 9.96E-01 | | 3.24E-01 | 4.67E-01 |
| | SB-126 | 414.70 | | 83.30 | 2.73E+01 | 2.73E+01 | 3.62E+00 | 1.30E+01 |
| | | 666.33 | | 99.60 | 3.13E+01 | | 6.22E+00 | 1.48E+01 |
| | | 695.00 | | 99.60 | 3.09E+01 | | -2.60E+01 | 1.45E+01 |
| | | 720.50 | | 53.80 | 5.61E+01 | | 1.00E+01 | 2.62E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 2.27E-01 | 2.27E-01 | 2.14E-01 | 1.12E-01 |
| | SB-127 | 473.00 | | 25.00 | 2.13E+07 | 1.86E+07 | 9.21E+06 | 1.01E+07 |
| | | 685.20 | | 35.70 | 1.86E+07 | | -8.85E+06 | 8.74E+06 |
| | | 783.80 | | 14.70 | 5.29E+07 | | -3.49E+06 | 2.48E+07 |
| | I-129 | 29.78 | | 57.00 | 2.94E-01 | 2.94E-01 | 3.85E-02 | 1.43E-01 |
| | | 33.60 | | 13.20 | 9.63E-01 | | -3.75E-01 | 4.69E-01 |
| | | 39.58 | | 7.52 | 1.32E+00 | | -3.83E-01 | 6.41E-01 |
| | I-131 | 284.30 | | 6.05 | 6.18E+03 | 4.83E+02 | 9.10E+02 | 2.96E+03 |
| | | 364.48 | | 81.20 | 4.83E+02 | | -4.07E+01 | 2.29E+02 |
| | | 636.97 | | 7.26 | 7.82E+03 | | 2.03E+03 | 3.67E+03 |
| | | 722.89 | | 1.80 | 3.78E+04 | | 3.48E+03 | 1.78E+04 |
| | TE-132 | 49.72 | | 13.10 | 9.71E+08 | 1.23E+08 | 1.62E+08 | 4.75E+08 |
| | | 228.16 | | 88.00 | 1.23E+08 | | -4.14E+07 | 5.96E+07 |
| | BA-133 | 81.00 | | 33.00 | 2.50E-01 | 1.76E-01 | -6.36E-01 | 1.23E-01 |
| | | 302.84 | | 17.80 | 4.71E-01 | | -5.25E-02 | 2.26E-01 |
| | | 356.01 | | 60.00 | 1.76E-01 | | -3.55E-03 | 8.49E-02 |
| @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | XE-133 | 81.00 | | 38.00 | 1.07E+05 | 1.07E+05 | -2.73E+05 | 5.26E+04 |
| | CS-134 | 563.23 | | 8.38 | 1.26E+00 | 1.33E-01 | 2.42E-01 | 5.92E-01 |
| | | 569.32 | | 15.43 | 7.12E-01 | | 5.07E-01 | 3.35E-01 |
| | | 604.70 | | 97.60 | 1.33E-01 | | -5.57E-01 | 6.30E-02 |
| | | 795.84 | | 85.40 | 1.76E-01 | | 1.07E-01 | 8.28E-02 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| CS-134 | 801.93 | 8.73 | 1.59E+00 | 1.33E-01 | -2.82E-01 | 7.45E-01 |
| CS-135 | 268.24 | 16.00 | 4.85E-01 | 4.85E-01 | -1.59E-01 | 2.34E-01 |
| @ I-135 | 1131.51 | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 1260.41 | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 1678.03 | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CS-136 | 153.22 | 7.46 | 1.61E+02 | 2.32E+01 | -6.57E+01 | 7.83E+01 |
| | 163.89 | 4.61 | 2.64E+02 | | 7.92E+01 | 1.28E+02 |
| | 176.55 | 13.56 | 9.19E+01 | | 1.86E+01 | 4.46E+01 |
| | 273.65 | 12.66 | 1.23E+02 | | 2.34E+01 | 5.96E+01 |
| | 340.57 | 48.50 | 3.84E+01 | | 4.67E+01 | 1.85E+01 |
| | 818.50 | 99.70 | 2.32E+01 | | -3.57E+00 | 1.08E+01 |
| | 1048.07 | 79.60 | 3.52E+01 | | 9.78E+00 | 1.64E+01 |
| | 1235.34 | 19.70 | 2.01E+02 | | 9.33E+01 | 9.47E+01 |
| CS-137 | 661.65 | 85.12 | 1.39E-01 | 1.39E-01 | 1.23E-01 | 6.57E-02 |
| LA-138 | 788.74 | 34.00 | 3.63E-01 | 1.74E-01 | -1.49E-01 | 1.69E-01 |
| | 1435.80 | 66.00 | 1.74E-01 | | -2.20E-02 | 7.65E-02 |
| CE-139 | 165.85 | 80.35 | 1.35E-01 | 1.35E-01 | 1.56E-02 | 6.55E-02 |
| BA-140 | 162.64 | 6.70 | 2.13E+02 | 8.63E+01 | 1.01E+02 | 1.04E+02 |
| | 304.84 | 4.50 | 3.92E+02 | | 1.00E+02 | 1.89E+02 |
| | 423.70 | 3.20 | 6.06E+02 | | -5.59E+01 | 2.88E+02 |
| | 437.55 | 2.00 | 9.30E+02 | | -1.06E+02 | 4.40E+02 |
| | 537.32 | 25.00 | 8.63E+01 | | 9.71E+00 | 4.07E+01 |
| LA-140 | 328.77 | 20.50 | 8.97E+01 | 3.39E+01 | 5.84E+01 | 4.30E+01 |
| | 487.03 | 45.50 | 4.16E+01 | | 2.40E+00 | 1.96E+01 |
| | 815.85 | 23.50 | 1.12E+02 | | -2.38E+01 | 5.20E+01 |
| | 1596.49 | 95.49 | 3.39E+01 | | 1.46E+01 | 1.52E+01 |
| CE-141 | 145.44 | 48.40 | 1.11E+00 | 1.11E+00 | 4.80E-01 | 5.41E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 7.54E-01 | 7.54E-01 | -2.96E-01 | 3.68E-01 |
| PM-144 | 476.78 | 42.00 | 2.59E-01 | 1.28E-01 | 8.47E-02 | 1.22E-01 |
| | 618.01 | 98.60 | 1.28E-01 | | 3.70E-02 | 6.00E-02 |
| | 696.49 | 99.49 | 1.57E-01 | | 9.19E-02 | 7.40E-02 |
| PM-145 | 36.85 | 21.70 | 5.06E-01 | 2.70E-01 | -5.89E-02 | 2.47E-01 |
| | 37.36 | 39.70 | 2.70E-01 | | -3.14E-02 | 1.32E-01 |
| | 42.30 | 15.10 | 6.16E-01 | | -5.77E-01 | 3.00E-01 |
| | 72.40 | 2.31 | 3.94E+00 | | -3.71E-02 | 1.94E+00 |
| PM-146 | 453.90 | 39.94 | 2.22E-01 | 2.22E-01 | -1.10E-01 | 1.05E-01 |
| | 735.90 | 14.01 | 8.18E-01 | | 3.80E-03 | 3.81E-01 |
| | 747.13 | 13.10 | 1.00E+00 | | 3.30E-01 | 4.69E-01 |
| ND-147 | 91.11 | 28.90 | 1.48E+02 | 1.48E+02 | 1.92E+02 | 7.28E+01 |
| | 531.02 | 13.10 | 3.81E+02 | | 1.05E+02 | 1.79E+02 |
| PM-149 | 285.90 | 3.10 | 7.75E+13 | 7.75E+13 | 1.34E+12 | 3.72E+13 |
| EU-152 | 121.78 | 20.50 | 2.96E-01 | 2.96E-01 | -6.88E-02 | 1.44E-01 |
| | 244.69 | 5.40 | 1.55E+00 | | -2.45E-02 | 7.52E-01 |
| | 344.27 | 19.13 | 4.06E-01 | | 3.48E-02 | 1.94E-01 |
| | 778.89 | 9.20 | 1.35E+00 | | -9.91E-02 | 6.32E-01 |
| | 964.01 | 10.40 | 1.58E+00 | | 3.56E-01 | 7.44E-01 |
| | 1085.78 | 7.22 | 2.04E+00 | | 4.17E-01 | 9.42E-01 |
| | 1112.02 | 9.60 | 1.83E+00 | | -1.57E-01 | 8.57E-01 |
| | 1407.95 | 14.94 | 9.47E-01 | | 3.00E-01 | 4.27E-01 |
| GD-153 | 97.43 | 31.30 | 2.78E-01 | 2.78E-01 | -3.72E-01 | 1.36E-01 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | GD-153 | 103.18 | | 22.20 | 3.76E-01 | 2.78E-01 | 6.75E-02 | 1.84E-01 |
| | EU-154 | 123.07 | | 40.50 | 1.54E-01 | 1.54E-01 | 4.21E-02 | 7.51E-02 |
| | | 723.30 | | 19.70 | 7.24E-01 | | 1.08E-01 | 3.42E-01 |
| | | 873.19 | | 11.50 | 1.12E+00 | | 5.70E-02 | 5.19E-01 |
| | | 996.32 | | 10.30 | 1.60E+00 | | 9.89E-01 | 7.51E-01 |
| | | 1004.76 | | 17.90 | 8.32E-01 | | 1.63E-01 | 3.87E-01 |
| | | 1274.45 | | 35.50 | 4.84E-01 | | 1.77E-01 | 2.24E-01 |
| + | EU-155 | 86.50 | * | 30.90 | 2.83E-01 | 2.83E-01 | 2.66E-01 | 1.39E-01 |
| | | 105.30 | | 20.70 | 3.08E-01 | | 1.37E-01 | 1.50E-01 |
| | EU-156 | 811.77 | | 10.40 | 1.16E+02 | 1.16E+02 | 2.79E+01 | 5.43E+01 |
| | | 1153.47 | | 7.20 | 2.37E+02 | | 1.56E+02 | 1.11E+02 |
| | | 1230.71 | | 8.90 | 2.08E+02 | | -2.39E+01 | 9.75E+01 |
| | HO-166M | 184.41 | | 72.60 | 1.08E-01 | 1.08E-01 | 1.33E-01 | 5.28E-02 |
| | | 280.45 | | 29.60 | 2.39E-01 | | -3.11E-02 | 1.15E-01 |
| | | 410.94 | | 11.10 | 8.35E-01 | | 4.49E-01 | 3.98E-01 |
| | | 711.69 | | 54.10 | 2.35E-01 | | 5.00E-02 | 1.11E-01 |
| | TM-171 | 66.72 | | 0.14 | 6.23E+01 | 6.23E+01 | -4.71E+01 | 3.05E+01 |
| | HF-172 | 67.35 | | 5.31 | 1.64E+00 | 6.30E-01 | -1.24E+00 | 8.04E-01 |
| | | 125.81 | | 11.30 | 6.30E-01 | | 5.50E-02 | 3.07E-01 |
| | LU-172 | 181.53 | | 20.60 | 9.55E+03 | 6.63E+03 | 2.45E+03 | 4.64E+03 |
| | | 900.72 | | 29.81 | 1.36E+04 | | 4.66E+03 | 6.35E+03 |
| | | 1093.66 | | 62.50 | 6.63E+03 | | -1.98E+03 | 3.06E+03 |
| | LU-173 | 100.72 | | 5.24 | 1.36E+00 | 4.55E-01 | 1.86E-02 | 6.64E-01 |
| | | 272.11 | | 21.20 | 4.55E-01 | | 3.07E-01 | 2.20E-01 |
| | HF-175 | 343.40 | | 84.00 | 2.43E-01 | 2.43E-01 | 2.09E-02 | 1.16E-01 |
| | LU-176 | 88.34 | | 13.30 | 6.05E-01 | 8.22E-02 | 2.12E-01 | 2.97E-01 |
| | | 201.83 | | 86.00 | 8.49E-02 | | 2.39E-02 | 4.12E-02 |
| | | 306.78 | | 94.00 | 8.22E-02 | | -5.87E-02 | 3.94E-02 |
| | HF-181 | 133.02 | | 41.70 | 8.03E-01 | 4.77E-01 | 2.11E-01 | 3.92E-01 |
| | | 345.85 | | 17.20 | 2.27E+00 | | 1.95E-01 | 1.08E+00 |
| | | 482.03 | | 82.80 | 4.77E-01 | | -3.78E-01 | 2.23E-01 |
| | TA-182 | 67.75 | | 41.20 | 3.46E-01 | 3.46E-01 | -2.07E-01 | 1.70E-01 |
| | | 1121.30 | | 34.90 | 1.02E+00 | | 8.82E-01 | 4.80E-01 |
| | | 1189.05 | | 16.23 | 1.92E+00 | | 2.01E-01 | 8.92E-01 |
| | | 1221.41 | | 26.98 | 1.28E+00 | | 2.40E-01 | 6.00E-01 |
| | | 1231.02 | | 11.44 | 3.25E+00 | | -4.98E-01 | 1.53E+00 |
| | IR-192 | 308.46 | | 29.68 | 6.85E-01 | 4.72E-01 | 3.32E-01 | 3.29E-01 |
| | | 468.07 | | 48.10 | 4.72E-01 | | -1.81E-01 | 2.23E-01 |
| | HG-203 | 279.19 | | 77.30 | 4.23E-01 | 4.23E-01 | -2.71E-02 | 2.03E-01 |
| | TL-204 | 374.74 | | 94.11 | 8.83E-02 | 8.83E-02 | 8.55E-03 | 4.20E-02 |
| | | 899.15 | | 99.16 | 1.44E-01 | | -2.87E-02 | 6.73E-02 |
| | | 911.74 | | 91.10 | 2.13E-01 | | 3.36E-01 | 1.01E-01 |
| + | BI-207 | 569.67 | * | 97.72 | 1.17E-01 | 1.17E-01 | 6.99E-02 | 5.54E-02 |
| | | 1063.62 | | 74.90 | 2.03E-01 | | 7.37E-02 | 9.42E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 5.64E-01 | 5.64E-01 | 1.31E+00 | 2.72E-01 |
| | | 860.37 | * | 4.48 | 4.36E+00 | | 2.14E+00 | 2.08E+00 |
| | | 2614.66 | | 35.85 | 9.88E-01 | | 1.32E+00 | 4.58E-01 |
| | BI-210M | 262.00 | | 45.00 | 1.61E-01 | 1.61E-01 | -2.59E-02 | 7.75E-02 |
| | | 300.00 | | 23.00 | 3.87E-01 | | 7.36E-02 | 1.87E-01 |
| | PB-210 | 46.50 | | 4.25 | 2.14E+00 | 2.14E+00 | 5.43E-01 | 1.05E+00 |
| | PB-211 | 404.84 | | 2.90 | 2.90E+00 | 2.90E+00 | -4.30E-01 | 1.38E+00 |
| | | 831.96 | | 2.90 | 4.71E+00 | | 8.30E-02 | 2.21E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 1.63E+00 | 1.63E+00 | 1.58E+00 | 7.85E-01 |

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BI-212 | 1620.62 | | 2.75 | 3.62E+00 | 1.63E+00 | -1.45E-01 | 1.53E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 2.64E-01 | 2.64E-01 | 1.73E+00 | 1.29E-01 |
| | | 300.09 | | 3.41 | 2.61E+00 | | 4.97E-01 | 1.26E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 4.73E-01 | 4.51E-01 | 1.17E+00 | 2.30E-01 |
| | | 1120.29 | * | 15.10 | 1.04E+00 | | 1.52E+00 | 4.84E-01 |
| | | 1764.49 | * | 15.80 | 4.51E-01 | | 1.17E+00 | 1.72E-01 |
| | | 2204.22 | * | 4.98 | 1.94E+00 | | 2.47E+00 | 7.56E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 6.64E-01 | 3.62E-01 | 8.53E-01 | 3.24E-01 |
| | | 351.92 | * | 37.19 | 3.62E-01 | | 1.10E+00 | 1.76E-01 |
| | RN-219 | 401.80 | | 6.50 | 1.27E+00 | 1.27E+00 | -2.09E-01 | 6.05E-01 |
| | RA-223 | 323.87 | | 3.88 | 2.03E+00 | 2.03E+00 | -4.77E-02 | 9.73E-01 |
| | RA-224 | 240.98 | | 3.95 | 3.61E+00 | 3.61E+00 | 1.83E+01 | 1.77E+00 |
| | RA-225 | 40.00 | | 31.00 | 3.29E+01 | 3.29E+01 | -9.55E+00 | 1.60E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.72E+00 | 2.72E+00 | 2.67E+00 | 1.33E+00 |
| | TH-227 | 50.10 | | 8.40 | 1.01E+00 | 1.01E+00 | 1.68E-01 | 4.92E-01 |
| | | 236.00 | | 11.50 | 1.04E+00 | | 7.10E-02 | 5.12E-01 |
| | | 256.20 | | 6.30 | 1.18E+00 | | 2.98E-01 | 5.70E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.04E+00 | 4.66E-01 | 1.35E+00 | 5.05E-01 |
| | | 911.07 | * | 27.70 | 4.66E-01 | | 1.14E+00 | 2.16E-01 |
| | | 969.11 | * | 16.60 | 1.41E+00 | | 8.23E-01 | 6.76E-01 |
| | TH-230 | 48.44 | | 16.90 | 5.13E-01 | 5.13E-01 | 1.09E-01 | 2.51E-01 |
| | | 62.85 | | 4.60 | 1.78E+00 | | -3.65E-01 | 8.72E-01 |
| | | 67.67 | | 0.37 | 2.11E+01 | | -1.26E+01 | 1.03E+01 |
| | PA-231 | 283.67 | | 1.60 | 4.46E+00 | 3.58E+00 | 6.58E-01 | 2.14E+00 |
| | | 302.67 | | 2.30 | 3.58E+00 | | -3.99E-01 | 1.72E+00 |
| | TH-231 | 25.64 | | 14.70 | 1.70E+00 | 1.17E+00 | 4.40E-01 | 8.29E-01 |
| | | 84.21 | | 6.40 | 1.17E+00 | | -9.78E-01 | 5.76E-01 |
| | PA-233 | 311.98 | | 38.60 | 2.55E+00 | 2.55E+00 | 5.56E-01 | 1.22E+00 |
| | PA-234 | 131.20 | | 20.40 | 3.27E-01 | 3.27E-01 | 1.35E-01 | 1.60E-01 |
| | | 733.99 | | 8.80 | 1.37E+00 | | 1.36E-01 | 6.43E-01 |
| | | 946.00 | | 12.00 | 1.11E+00 | | -3.65E-01 | 5.14E-01 |
| | PA-234M | 1001.03 | | 0.92 | 1.64E+01 | 1.64E+01 | -7.73E-01 | 7.65E+00 |
| | TH-234 | 63.29 | | 3.80 | 2.14E+00 | 2.14E+00 | -4.40E-01 | 1.05E+00 |
| | U-235 | 143.76 | | 10.50 | 6.21E-01 | 6.21E-01 | 2.42E-01 | 3.03E-01 |
| | | 163.35 | | 4.70 | 1.40E+00 | | 6.62E-01 | 6.81E-01 |
| | | 205.31 | | 4.70 | 1.56E+00 | | -1.11E+00 | 7.56E-01 |
| + | NP-237 | 86.50 | * | 12.60 | 6.67E-01 | 6.67E-01 | 6.28E-01 | 3.28E-01 |
| | NP-239 | 106.10 | | 22.70 | 1.31E+12 | 1.31E+12 | 1.59E+11 | 6.37E+11 |
| | | 228.18 | | 10.70 | 3.35E+12 | | -1.12E+12 | 1.62E+12 |
| | | 277.60 | | 14.10 | 2.62E+12 | | 3.88E+11 | 1.26E+12 |
| | AM-241 | 59.54 | | 35.90 | 2.38E-01 | 2.38E-01 | 1.83E-01 | 1.17E-01 |
| | AM-243 | 74.67 | | 66.00 | 1.65E-01 | 1.65E-01 | 7.57E-01 | 8.12E-02 |
| | CM-243 | 209.75 | | 3.29 | 2.35E+00 | 5.39E-01 | 1.32E+00 | 1.14E+00 |
| | | 228.14 | | 10.60 | 6.90E-01 | | -2.32E-01 | 3.34E-01 |
| | | 277.60 | | 14.00 | 5.39E-01 | | 7.98E-02 | 2.59E-01 |

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

Analysis Report for 1707087-19

HTC-A03-S003-2430-01

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S003-2430-01

Elapsed Live time: 3600
Elapsed Real Time: 3621

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 102 |
| 17: | 99 | 81 | 81 | 79 | 76 | 79 | 86 | 74 |
| 25: | 82 | 62 | 79 | 81 | 63 | 78 | 55 | 71 |
| 33: | 58 | 63 | 76 | 59 | 72 | 70 | 70 | 70 |
| 41: | 76 | 72 | 80 | 76 | 103 | 108 | 90 | 89 |
| 49: | 89 | 87 | 105 | 89 | 96 | 88 | 107 | 111 |
| 57: | 128 | 132 | 110 | 118 | 145 | 161 | 134 | 120 |
| 65: | 103 | 126 | 139 | 150 | 115 | 124 | 143 | 156 |
| 73: | 227 | 320 | 305 | 385 | 312 | 174 | 111 | 116 |
| 81: | 106 | 102 | 133 | 128 | 145 | 183 | 190 | 114 |
| 89: | 155 | 140 | 140 | 184 | 150 | 100 | 90 | 76 |
| 97: | 74 | 96 | 98 | 101 | 90 | 62 | 86 | 85 |
| 105: | 93 | 79 | 88 | 64 | 88 | 78 | 80 | 74 |
| 113: | 75 | 85 | 78 | 89 | 58 | 58 | 72 | 70 |
| 121: | 64 | 69 | 73 | 95 | 74 | 79 | 79 | 95 |
| 129: | 103 | 75 | 76 | 79 | 76 | 81 | 72 | 65 |
| 137: | 72 | 64 | 64 | 71 | 79 | 81 | 73 | 66 |
| 145: | 64 | 68 | 74 | 60 | 54 | 55 | 71 | 64 |
| 153: | 78 | 63 | 64 | 80 | 65 | 54 | 59 | 49 |
| 161: | 61 | 55 | 67 | 71 | 69 | 47 | 55 | 55 |
| 169: | 69 | 52 | 58 | 55 | 51 | 64 | 54 | 50 |
| 177: | 54 | 61 | 59 | 49 | 53 | 46 | 50 | 73 |
| 185: | 129 | 106 | 56 | 54 | 55 | 57 | 50 | 47 |
| 193: | 47 | 54 | 59 | 44 | 53 | 65 | 54 | 53 |
| 201: | 43 | 53 | 56 | 54 | 54 | 49 | 60 | 67 |
| 209: | 71 | 50 | 46 | 49 | 47 | 42 | 43 | 46 |
| 217: | 43 | 45 | 42 | 28 | 39 | 46 | 48 | 52 |
| 225: | 37 | 44 | 43 | 48 | 40 | 35 | 51 | 42 |
| 233: | 41 | 26 | 44 | 62 | 241 | 330 | 197 | 98 |
| 241: | 94 | 71 | 40 | 40 | 33 | 34 | 28 | 28 |
| 249: | 29 | 32 | 31 | 47 | 35 | 24 | 36 | 39 |
| 257: | 40 | 29 | 38 | 30 | 33 | 43 | 28 | 25 |
| 265: | 34 | 26 | 24 | 37 | 46 | 56 | 46 | 39 |
| 273: | 34 | 27 | 31 | 45 | 43 | 27 | 19 | 23 |
| 281: | 23 | 26 | 26 | 30 | 28 | 30 | 28 | 26 |
| 289: | 34 | 28 | 39 | 18 | 44 | 92 | 90 | 52 |
| 297: | 31 | 43 | 32 | 35 | 37 | 32 | 22 | 30 |
| 305: | 30 | 35 | 23 | 27 | 19 | 39 | 26 | 20 |
| 313: | 24 | 23 | 18 | 21 | 21 | 23 | 24 | 28 |
| 321: | 20 | 21 | 24 | 23 | 20 | 37 | 31 | 33 |
| 329: | 32 | 17 | 24 | 20 | 20 | 23 | 23 | 34 |
| 337: | 72 | 66 | 31 | 19 | 21 | 21 | 23 | 18 |
| 345: | 23 | 18 | 20 | 20 | 40 | 88 | 143 | 108 |
| 353: | 42 | 23 | 21 | 17 | 27 | 12 | 15 | 26 |
| 361: | 13 | 19 | 20 | 21 | 17 | 12 | 19 | 16 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 16 | 17 | 17 | 15 | 23 | 24 | 20 | 14 |

Sample Title: HTC-A03-S003-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 14 | 16 | 20 | 17 | 17 | 16 | 22 | 19 |
| 385: | 19 | 23 | 14 | 16 | 15 | 19 | 24 | 19 |
| 393: | 23 | 20 | 18 | 24 | 18 | 24 | 12 | 17 |
| 401: | 12 | 16 | 25 | 14 | 15 | 18 | 22 | 30 |
| 409: | 14 | 19 | 20 | 22 | 18 | 13 | 19 | 21 |
| 417: | 16 | 23 | 13 | 19 | 22 | 14 | 19 | 15 |
| 425: | 14 | 22 | 22 | 16 | 12 | 13 | 14 | 17 |
| 433: | 14 | 17 | 16 | 17 | 19 | 15 | 14 | 9 |
| 441: | 15 | 18 | 13 | 17 | 15 | 14 | 16 | 14 |
| 449: | 24 | 15 | 10 | 17 | 15 | 8 | 16 | 18 |
| 457: | 19 | 14 | 11 | 14 | 17 | 27 | 23 | 21 |
| 465: | 14 | 17 | 13 | 12 | 11 | 14 | 14 | 11 |
| 473: | 15 | 22 | 18 | 13 | 12 | 12 | 7 | 11 |
| 481: | 12 | 14 | 10 | 5 | 17 | 16 | 17 | 10 |
| 489: | 13 | 10 | 13 | 15 | 6 | 10 | 9 | 11 |
| 497: | 11 | 14 | 15 | 14 | 22 | 17 | 11 | 15 |
| 505: | 16 | 16 | 15 | 23 | 46 | 52 | 37 | 16 |
| 513: | 14 | 16 | 5 | 23 | 13 | 13 | 5 | 16 |
| 521: | 12 | 15 | 8 | 13 | 6 | 11 | 12 | 7 |
| 529: | 13 | 11 | 15 | 12 | 17 | 10 | 15 | 11 |
| 537: | 9 | 14 | 18 | 17 | 13 | 9 | 10 | 18 |
| 545: | 6 | 8 | 11 | 7 | 18 | 12 | 14 | 15 |
| 553: | 16 | 8 | 16 | 14 | 12 | 11 | 17 | 10 |
| 561: | 14 | 14 | 10 | 10 | 5 | 5 | 14 | 5 |
| 569: | 12 | 16 | 17 | 16 | 8 | 7 | 13 | 7 |
| 577: | 9 | 15 | 11 | 17 | 33 | 61 | 86 | 25 |
| 585: | 12 | 13 | 10 | 11 | 13 | 12 | 12 | 16 |
| 593: | 15 | 19 | 13 | 13 | 11 | 15 | 10 | 14 |
| 601: | 10 | 8 | 21 | 10 | 7 | 28 | 23 | 91 |
| 609: | 72 | 35 | 19 | 14 | 9 | 13 | 14 | 5 |
| 617: | 9 | 10 | 14 | 13 | 6 | 9 | 4 | 9 |
| 625: | 11 | 3 | 9 | 10 | 19 | 16 | 15 | 4 |
| 633: | 11 | 8 | 14 | 13 | 14 | 11 | 9 | 10 |
| 641: | 10 | 9 | 9 | 18 | 9 | 13 | 7 | 7 |
| 649: | 15 | 11 | 11 | 7 | 16 | 14 | 5 | 6 |
| 657: | 10 | 8 | 5 | 6 | 10 | 10 | 14 | 16 |
| 665: | 9 | 6 | 4 | 12 | 17 | 4 | 11 | 9 |
| 673: | 3 | 11 | 14 | 4 | 8 | 10 | 15 | 8 |
| 681: | 6 | 5 | 4 | 9 | 7 | 12 | 12 | 14 |
| 689: | 11 | 7 | 7 | 8 | 14 | 7 | 12 | 7 |
| 697: | 11 | 9 | 11 | 17 | 9 | 7 | 14 | 9 |
| 705: | 11 | 6 | 13 | 11 | 9 | 9 | 5 | 14 |
| 713: | 10 | 9 | 9 | 11 | 7 | 8 | 10 | 5 |
| 721: | 7 | 14 | 6 | 5 | 13 | 23 | 22 | 16 |
| 729: | 14 | 11 | 8 | 9 | 4 | 7 | 7 | 9 |
| 737: | 6 | 6 | 6 | 9 | 5 | 5 | 6 | 14 |
| 745: | 9 | 11 | 7 | 8 | 10 | 10 | 5 | 10 |
| 753: | 9 | 11 | 8 | 6 | 9 | 9 | 14 | 9 |
| 761: | 8 | 9 | 7 | 6 | 7 | 13 | 14 | 15 |
| 769: | 7 | 11 | 6 | 13 | 5 | 7 | 8 | 6 |
| 777: | 7 | 13 | 8 | 5 | 6 | 9 | 14 | 12 |
| 785: | 17 | 6 | 5 | 4 | 5 | 7 | 8 | 4 |
| 793: | 15 | 12 | 10 | 6 | 10 | 8 | 11 | 8 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 5 | 6 | 10 | 5 | 7 | 10 | 8 | 8 |

Sample Title: HTC-A03-S003-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 8 | 8 | 5 | 7 | 8 | 14 | 6 | 6 |
| 817: | 5 | 7 | 3 | 5 | 10 | 8 | 5 | 11 |
| 825: | 7 | 8 | 14 | 6 | 11 | 7 | 5 | 7 |
| 833: | 6 | 8 | 12 | 10 | 8 | 12 | 10 | 7 |
| 841: | 5 | 7 | 6 | 5 | 13 | 11 | 6 | 3 |
| 849: | 6 | 10 | 6 | 5 | 5 | 9 | 7 | 4 |
| 857: | 11 | 7 | 12 | 15 | 14 | 7 | 4 | 3 |
| 865: | 8 | 3 | 8 | 5 | 6 | 3 | 7 | 9 |
| 873: | 9 | 7 | 4 | 5 | 8 | 6 | 6 | 6 |
| 881: | 6 | 5 | 4 | 10 | 4 | 4 | 6 | 5 |
| 889: | 4 | 3 | 4 | 6 | 6 | 12 | 6 | 11 |
| 897: | 7 | 8 | 9 | 4 | 11 | 4 | 5 | 10 |
| 905: | 5 | 3 | 5 | 3 | 14 | 31 | 39 | 16 |
| 913: | 7 | 4 | 2 | 3 | 5 | 10 | 7 | 5 |
| 921: | 3 | 6 | 5 | 8 | 6 | 7 | 17 | 6 |
| 929: | 3 | 6 | 9 | 3 | 8 | 13 | 5 | 7 |
| 937: | 4 | 9 | 8 | 9 | 7 | 7 | 7 | 8 |
| 945: | 6 | 7 | 5 | 6 | 3 | 7 | 7 | 6 |
| 953: | 7 | 3 | 5 | 7 | 4 | 7 | 7 | 12 |
| 961: | 6 | 7 | 6 | 15 | 9 | 8 | 13 | 28 |
| 969: | 33 | 18 | 4 | 7 | 8 | 9 | 8 | 10 |
| 977: | 3 | 1 | 9 | 3 | 12 | 5 | 9 | 3 |
| 985: | 8 | 4 | 6 | 4 | 8 | 2 | 8 | 9 |
| 993: | 6 | 14 | 7 | 11 | 7 | 6 | 6 | 11 |
| 1001: | 6 | 6 | 8 | 5 | 3 | 8 | 6 | 8 |
| 1009: | 6 | 11 | 14 | 8 | 7 | 3 | 5 | 7 |
| 1017: | 3 | 8 | 7 | 7 | 5 | 6 | 11 | 4 |
| 1025: | 5 | 9 | 4 | 7 | 9 | 6 | 4 | 4 |
| 1033: | 10 | 8 | 7 | 9 | 7 | 5 | 2 | 8 |
| 1041: | 5 | 7 | 3 | 4 | 10 | 6 | 9 | 7 |
| 1049: | 9 | 8 | 4 | 5 | 5 | 7 | 15 | 10 |
| 1057: | 1 | 6 | 9 | 9 | 6 | 9 | 4 | 3 |
| 1065: | 7 | 5 | 7 | 3 | 9 | 3 | 9 | 6 |
| 1073: | 4 | 7 | 4 | 8 | 3 | 3 | 4 | 7 |
| 1081: | 8 | 2 | 3 | 8 | 7 | 7 | 5 | 9 |
| 1089: | 3 | 4 | 5 | 8 | 8 | 5 | 7 | 5 |
| 1097: | 5 | 3 | 10 | 10 | 5 | 4 | 2 | 8 |
| 1105: | 3 | 12 | 15 | 12 | 9 | 7 | 6 | 6 |
| 1113: | 5 | 9 | 4 | 4 | 7 | 9 | 18 | 19 |
| 1121: | 14 | 9 | 8 | 4 | 4 | 6 | 7 | 4 |
| 1129: | 9 | 8 | 7 | 6 | 8 | 4 | 4 | 7 |
| 1137: | 6 | 5 | 5 | 2 | 8 | 7 | 11 | 4 |
| 1145: | 10 | 7 | 2 | 6 | 6 | 11 | 7 | 6 |
| 1153: | 12 | 8 | 11 | 8 | 8 | 4 | 6 | 7 |
| 1161: | 3 | 7 | 7 | 14 | 6 | 9 | 4 | 6 |
| 1169: | 5 | 3 | 6 | 9 | 8 | 11 | 8 | 6 |
| 1177: | 9 | 9 | 7 | 6 | 9 | 5 | 7 | 3 |
| 1185: | 8 | 13 | 7 | 8 | 3 | 4 | 9 | 6 |
| 1193: | 4 | 4 | 6 | 2 | 8 | 11 | 10 | 7 |
| 1201: | 14 | 6 | 11 | 8 | 9 | 8 | 10 | 5 |
| 1209: | 4 | 3 | 7 | 4 | 8 | 10 | 4 | 8 |
| 1217: | 8 | 10 | 7 | 6 | 5 | 12 | 6 | 8 |
| 1225: | 12 | 8 | 10 | 4 | 14 | 8 | 8 | 10 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 10 | 9 | 12 | 9 | 10 | 14 | 10 | 8 |

Sample Title: HTC-A03-S003-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 9 | 4 | 5 | 4 | 9 | 7 | 5 | 5 |
| 1249: | 6 | 7 | 5 | 11 | 11 | 4 | 7 | 5 |
| 1257: | 5 | 3 | 5 | 11 | 7 | 5 | 6 | 11 |
| 1265: | 5 | 10 | 4 | 6 | 2 | 7 | 6 | 6 |
| 1273: | 6 | 9 | 6 | 5 | 6 | 2 | 2 | 4 |
| 1281: | 8 | 3 | 3 | 3 | 9 | 3 | 6 | 4 |
| 1289: | 10 | 4 | 6 | 3 | 1 | 5 | 3 | 3 |
| 1297: | 4 | 4 | 2 | 1 | 3 | 9 | 4 | 6 |
| 1305: | 4 | 2 | 5 | 2 | 5 | 5 | 6 | 6 |
| 1313: | 3 | 4 | 4 | 2 | 6 | 5 | 4 | 4 |
| 1321: | 1 | 5 | 8 | 5 | 7 | 5 | 3 | 3 |
| 1329: | 2 | 4 | 1 | 4 | 8 | 1 | 5 | 4 |
| 1337: | 3 | 4 | 4 | 3 | 1 | 4 | 1 | 4 |
| 1345: | 4 | 2 | 5 | 3 | 1 | 2 | 1 | 5 |
| 1353: | 3 | 0 | 3 | 4 | 2 | 2 | 2 | 3 |
| 1361: | 1 | 3 | 3 | 2 | 3 | 1 | 5 | 1 |
| 1369: | 2 | 2 | 4 | 2 | 3 | 0 | 2 | 3 |
| 1377: | 4 | 3 | 4 | 3 | 3 | 3 | 2 | 3 |
| 1385: | 1 | 3 | 4 | 3 | 1 | 1 | 2 | 4 |
| 1393: | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 3 |
| 1401: | 6 | 4 | 4 | 4 | 0 | 6 | 7 | 1 |
| 1409: | 6 | 2 | 0 | 3 | 0 | 1 | 1 | 0 |
| 1417: | 4 | 1 | 2 | 1 | 0 | 1 | 0 | 1 |
| 1425: | 0 | 3 | 1 | 1 | 3 | 1 | 5 | 1 |
| 1433: | 2 | 1 | 4 | 1 | 2 | 0 | 2 | 3 |
| 1441: | 2 | 3 | 4 | 1 | 6 | 2 | 4 | 0 |
| 1449: | 2 | 1 | 0 | 2 | 4 | 1 | 2 | 1 |
| 1457: | 4 | 37 | 103 | 176 | 121 | 57 | 7 | 3 |
| 1465: | 1 | 1 | 1 | 1 | 4 | 0 | 1 | 3 |
| 1473: | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 |
| 1481: | 4 | 1 | 1 | 1 | 1 | 3 | 5 | 2 |
| 1489: | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 1 |
| 1497: | 2 | 0 | 1 | 4 | 1 | 1 | 0 | 2 |
| 1505: | 1 | 2 | 0 | 2 | 2 | 2 | 0 | 0 |
| 1513: | 0 | 0 | 3 | 0 | 0 | 3 | 2 | 3 |
| 1521: | 1 | 1 | 0 | 1 | 2 | 1 | 0 | 0 |
| 1529: | 1 | 1 | 0 | 2 | 2 | 1 | 2 | 2 |
| 1537: | 1 | 0 | 1 | 2 | 0 | 1 | 3 | 2 |
| 1545: | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 3 |
| 1553: | 1 | 0 | 2 | 0 | 3 | 1 | 0 | 4 |
| 1561: | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 |
| 1569: | 0 | 2 | 1 | 3 | 2 | 2 | 0 | 1 |
| 1577: | 3 | 1 | 1 | 2 | 2 | 3 | 2 | 1 |
| 1585: | 4 | 6 | 2 | 2 | 2 | 3 | 2 | 8 |
| 1593: | 5 | 3 | 1 | 2 | 1 | 2 | 3 | 1 |
| 1601: | 1 | 2 | 1 | 2 | 0 | 3 | 3 | 1 |
| 1609: | 2 | 2 | 2 | 3 | 0 | 2 | 2 | 0 |
| 1617: | 1 | 2 | 0 | 0 | 1 | 3 | 1 | 2 |
| 1625: | 0 | 3 | 0 | 0 | 4 | 5 | 0 | 1 |
| 1633: | 1 | 0 | 1 | 2 | 1 | 0 | 0 | 1 |
| 1641: | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 |
| 1649: | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 0 |
| 1657: | 3 | 1 | 2 | 2 | 0 | 2 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 2 | 1 | 0 | 2 | 2 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 1 |
| 1681: | 0 | 0 | 1 | 0 | 2 | 2 | 1 | 0 |
| 1689: | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 3 |
| 1697: | 1 | 3 | 1 | 0 | 0 | 1 | 0 | 1 |
| 1705: | 0 | 2 | 0 | 1 | 1 | 1 | 1 | 2 |
| 1713: | 0 | 2 | 3 | 0 | 1 | 2 | 1 | 2 |
| 1721: | 0 | 2 | 1 | 1 | 0 | 3 | 0 | 3 |
| 1729: | 2 | 1 | 0 | 1 | 0 | 2 | 1 | 0 |
| 1737: | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 |
| 1745: | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 |
| 1753: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 1761: | 1 | 1 | 9 | 10 | 7 | 3 | 0 | 1 |
| 1769: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 1777: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 1785: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 1793: | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 1801: | 1 | 1 | 1 | 0 | 1 | 1 | 3 | 0 |
| 1809: | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 |
| 1817: | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 |
| 1825: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 1833: | 0 | 2 | 1 | 1 | 0 | 1 | 0 | 2 |
| 1841: | 3 | 0 | 1 | 1 | 0 | 2 | 3 | 2 |
| 1849: | 2 | 0 | 1 | 0 | 3 | 1 | 1 | 1 |
| 1857: | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 1 |
| 1865: | 3 | 3 | 0 | 1 | 0 | 1 | 0 | 0 |
| 1873: | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 0 |
| 1881: | 1 | 1 | 1 | 0 | 2 | 0 | 1 | 3 |
| 1889: | 1 | 0 | 3 | 0 | 0 | 0 | 1 | 1 |
| 1897: | 0 | 2 | 0 | 0 | 2 | 1 | 0 | 1 |
| 1905: | 0 | 1 | 3 | 0 | 0 | 0 | 1 | 0 |
| 1913: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 1921: | 1 | 1 | 3 | 0 | 0 | 1 | 0 | 1 |
| 1929: | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 1937: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 1945: | 2 | 0 | 1 | 0 | 1 | 1 | 2 | 0 |
| 1953: | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 |
| 1961: | 1 | 1 | 2 | 1 | 2 | 0 | 3 | 0 |
| 1969: | 2 | 3 | 0 | 2 | 0 | 1 | 0 | 0 |
| 1977: | 0 | 1 | 1 | 2 | 0 | 0 | 3 | 1 |
| 1985: | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 0 |
| 1993: | 2 | 0 | 0 | 1 | 3 | 0 | 0 | 1 |
| 2001: | 0 | 2 | 3 | 0 | 0 | 1 | 0 | 2 |
| 2009: | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 0 |
| 2017: | 0 | 0 | 1 | 1 | 2 | 1 | 1 | 1 |
| 2025: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2033: | 1 | 0 | 1 | 2 | 1 | 0 | 1 | 3 |
| 2041: | 2 | 1 | 0 | 0 | 0 | 3 | 0 | 0 |
| 2049: | 2 | 1 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2057: | 0 | 1 | 0 | 3 | 4 | 2 | 0 | 0 |
| 2065: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2073: | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 2081: | 0 | 2 | 0 | 1 | 2 | 1 | 0 | 0 |
| 2089: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 1 | 0 | 0 | 1 | 0 | 2 | 3 | 3 |

Sample Title: HTC-A03-S003-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 1 |
| 2113: | 1 | 2 | 2 | 1 | 0 | 2 | 3 | 1 |
| 2121: | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 0 |
| 2129: | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 1 |
| 2137: | 1 | 0 | 2 | 0 | 2 | 2 | 1 | 0 |
| 2145: | 0 | 1 | 0 | 1 | 1 | 3 | 0 | 0 |
| 2153: | 1 | 0 | 1 | 1 | 0 | 0 | 2 | 1 |
| 2161: | 1 | 2 | 2 | 0 | 2 | 0 | 1 | 1 |
| 2169: | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 2177: | 0 | 0 | 2 | 1 | 4 | 2 | 1 | 2 |
| 2185: | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 2 |
| 2193: | 4 | 0 | 2 | 0 | 0 | 0 | 2 | 0 |
| 2201: | 1 | 0 | 4 | 6 | 3 | 2 | 0 | 1 |
| 2209: | 0 | 2 | 2 | 2 | 1 | 0 | 0 | 0 |
| 2217: | 0 | 1 | 1 | 0 | 2 | 2 | 2 | 1 |
| 2225: | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 2233: | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 |
| 2241: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 2249: | 0 | 1 | 2 | 2 | 1 | 0 | 0 | 1 |
| 2257: | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 2 |
| 2265: | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 2273: | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 1 |
| 2281: | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 |
| 2289: | 3 | 0 | 2 | 0 | 0 | 0 | 1 | 3 |
| 2297: | 1 | 1 | 1 | 1 | 3 | 0 | 0 | 1 |
| 2305: | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 1 |
| 2313: | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 1 |
| 2321: | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 2329: | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 2 |
| 2337: | 2 | 1 | 2 | 0 | 1 | 3 | 1 | 0 |
| 2345: | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 |
| 2353: | 1 | 2 | 0 | 0 | 2 | 2 | 0 | 1 |
| 2361: | 2 | 1 | 2 | 1 | 1 | 3 | 0 | 2 |
| 2369: | 2 | 3 | 0 | 1 | 1 | 1 | 1 | 1 |
| 2377: | 1 | 2 | 1 | 0 | 1 | 0 | 2 | 2 |
| 2385: | 1 | 2 | 2 | 0 | 1 | 2 | 1 | 1 |
| 2393: | 0 | 1 | 2 | 0 | 2 | 1 | 1 | 0 |
| 2401: | 1 | 0 | 0 | 1 | 1 | 0 | 4 | 0 |
| 2409: | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 0 |
| 2417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2425: | 1 | 0 | 2 | 0 | 1 | 1 | 1 | 1 |
| 2433: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2441: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
| 2449: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2457: | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 |
| 2465: | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 0 |
| 2473: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 |
| 2481: | 0 | 0 | 2 | 1 | 0 | 2 | 1 | 0 |
| 2489: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2497: | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 2505: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 2513: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2521: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2545: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2553: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2561: | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| 2569: | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2577: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2585: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2593: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2601: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2609: | 0 | 2 | 2 | 2 | 10 | 20 | 13 | 5 |
| 2617: | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2625: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2649: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2665: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2681: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2697: | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| 2705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2713: | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2721: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2729: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 2737: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2753: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2761: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2769: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2777: | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2785: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2793: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2801: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 2809: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2817: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2825: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2833: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2857: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2865: | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 1 |
| 2873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2881: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2889: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2897: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2905: | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2913: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 |
| 2921: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2937: | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2945: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2953: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2985: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3001: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3017: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3057: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3065: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 |
| 3081: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3097: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3105: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3113: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3121: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3129: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3137: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3145: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3161: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3169: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3177: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3185: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3193: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3201: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3233: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3249: | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3265: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3273: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3305: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3313: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3329: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3345: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3353: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3369: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3377: | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3385: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

Sample Title: HTC-A03-S003-2430-01

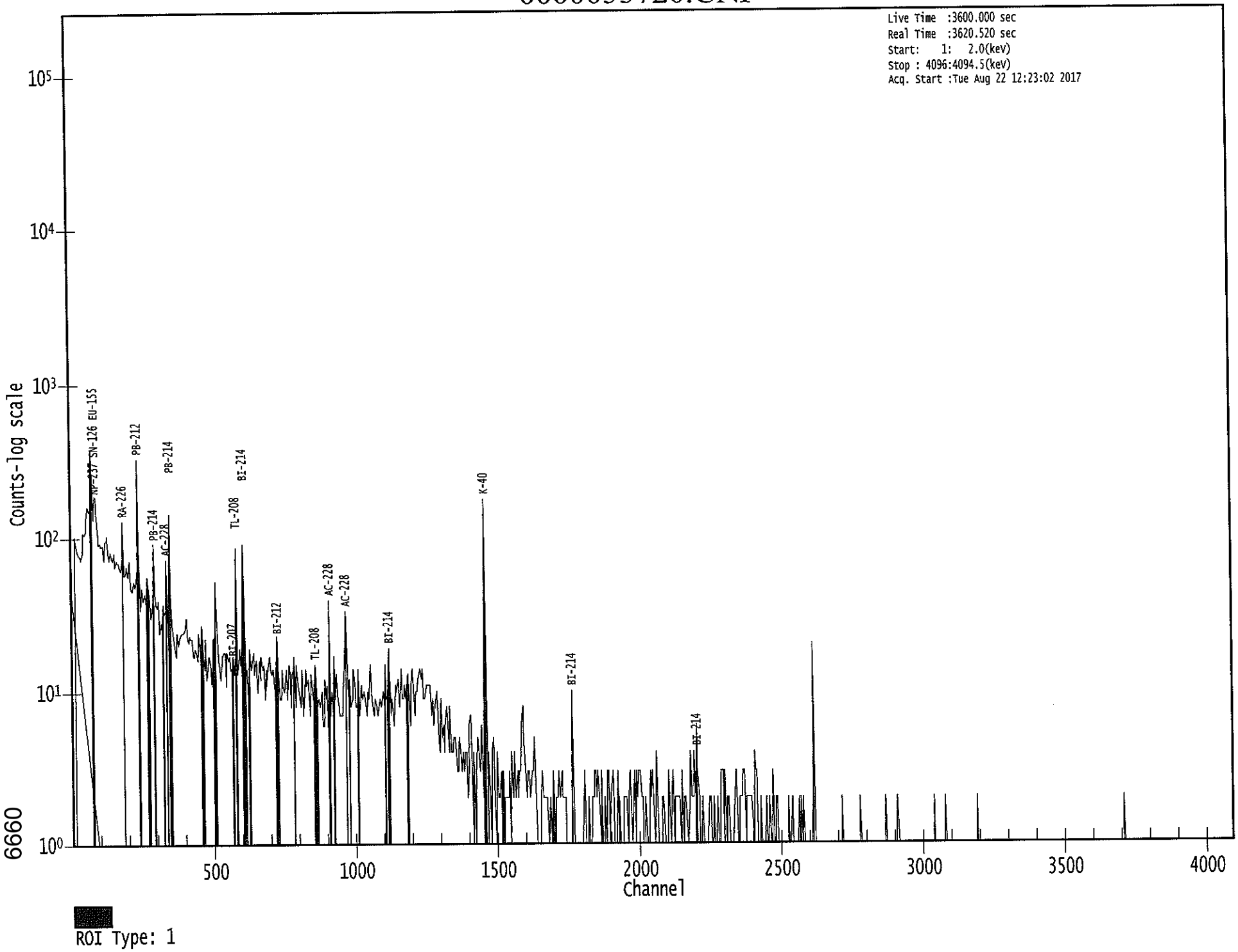
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3409: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3417: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3425: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3465: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3481: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3489: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3505: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3521: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3545: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3553: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3601: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3609: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3633: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3641: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3705: | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 |
| 3713: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3721: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3737: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3753: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3761: | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3769: | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| 3777: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3785: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3793: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3809: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3817: | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-2430-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3857: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3865: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3873: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3929: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3993: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4009: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4025: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4033: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

# 0000055720.CNF




6660

VLB 8/22/17

Apex-Gamma

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

# GAMMA SPECTRUM ANALYSIS

| | |
|---|---|
| Sample Identification | : 1707087-20 |
| Sample Description | : HTC-A03-S003-3036-01 |
| Sample Type | : SOIL |
| Sample Size | : 6.839E+02 grams |
| Facility | : Countroom |
| Sample Taken On | : 5/15/2017 5:48:30AM |
| Acquisition Started | : 8/22/2017 1:11:48PM |
| Procedure | : GAS-1602 pCi |
| Operator | : Administrator |
| Detector Name | : GE1 |
| Geometry | : GAS-1602 |
| Live Time | : 3600.0 seconds |
| Real Time | : 3601.4 seconds |
| Dead Time | : 0.04 % |
| Peak Locate Threshold | : 2.50 |
| Peak Locate Range (in channels) | : 1 - 4096 |
| Peak Area Range (in channels) | : 19 - 4096 |
| Identification Energy Tolerance | : 1.000 keV |
| Energy Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Used Done On | : 1/14/2017 |
| Efficiency Calibration Description | : |
| Sample Number | : 55722 |

# PEAK-TO-TOTAL CALIBRATION REPORT

## Peak-to-Total Efficiency Calibration Equation

AG 8/23/17

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

# PEAK LOCATE REPORT

Peak Locate Performed on : 8/22/2017 2:11:52PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096
Peak Search Sensitivity : 2.50

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 1 | 71.62 | 72.22 | 0.0000 | 0.00 |
| 2 | 74.69 | 75.28 | 0.0000 | 0.00 |
| 3 | 77.09 | 77.69 | 0.0000 | 0.00 |
| 4 | 87.74 | 88.32 | 0.0000 | 0.00 |
| 5 | 92.44 | 93.02 | 0.0000 | 0.00 |
| 6 | 144.38 | 144.91 | 0.0000 | 0.00 |
| 7 | 186.02 | 186.50 | 0.0000 | 0.00 |
| 8 | 209.78 | 210.24 | 0.0000 | 0.00 |
| 9 | 238.63 | 239.05 | 0.0000 | 0.00 |
| 10 | 241.74 | 242.17 | 0.0000 | 0.00 |
| 11 | 269.65 | 270.04 | 0.0000 | 0.00 |
| 12 | 295.32 | 295.69 | 0.0000 | 0.00 |
| 13 | 300.08 | 300.44 | 0.0000 | 0.00 |
| 14 | 338.40 | 338.72 | 0.0000 | 0.00 |
| 15 | 351.96 | 352.27 | 0.0000 | 0.00 |
| 16 | 463.33 | 463.53 | 0.0000 | 0.00 |
| 17 | 510.60 | 510.75 | 0.0000 | 0.00 |
| 18 | 583.44 | 583.51 | 0.0000 | 0.00 |
| 19 | 596.69 | 596.75 | 0.0000 | 0.00 |
| 20 | 606.13 | 606.19 | 0.0000 | 0.00 |
| 21 | 609.38 | 609.43 | 0.0000 | 0.00 |
| 22 | 613.95 | 614.00 | 0.0000 | 0.00 |
| 23 | 726.45 | 726.38 | 0.0000 | 0.00 |
| 24 | 795.72 | 795.58 | 0.0000 | 0.00 |
| 25 | 877.20 | 876.98 | 0.0000 | 0.00 |
| 26 | 908.45 | 908.20 | 0.0000 | 0.00 |
| 27 | 911.45 | 911.20 | 0.0000 | 0.00 |
| 28 | 935.56 | 935.29 | 0.0000 | 0.00 |
| 29 | 951.58 | 951.28 | 0.0000 | 0.00 |
| 30 | 965.51 | 965.20 | 0.0000 | 0.00 |
| 31 | 969.51 | 969.20 | 0.0000 | 0.00 |
| 32 | 1063.55 | 1063.14 | 0.0000 | 0.00 |
| 33 | 1121.03 | 1120.57 | 0.0000 | 0.00 |
| 34 | 1237.83 | 1237.25 | 0.0000 | 0.00 |
| 35 | 1378.41 | 1377.69 | 0.0000 | 0.00 |
| 36 | 1406.24 | 1405.49 | 0.0000 | 0.00 |
| 37 | 1461.32 | 1460.52 | 0.0000 | 0.00 |
| 38 | 1465.69 | 1464.89 | 0.0000 | 0.00 |
| 39 | 1554.28 | 1553.39 | 0.0000 | 0.00 |
| 40 | 1588.73 | 1587.81 | 0.0000 | 0.00 |
| 41 | 1594.61 | 1593.68 | 0.0000 | 0.00 |
| 42 | 1660.99 | 1660.00 | 0.0000 | 0.00 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| Peak No. | Energy (keV) | Centroid Channel | Centroid Uncertainty | Peak Significance |
|---|---|---|---|---|
| 43 | 1679.11 | 1678.10 | 0.0000 | 0.00 |
| 44 | 1717.83 | 1716.79 | 0.0000 | 0.00 |
| 45 | 1728.84 | 1727.79 | 0.0000 | 0.00 |
| 46 | 1765.13 | 1764.04 | 0.0000 | 0.00 |
| 47 | 1849.32 | 1848.14 | 0.0000 | 0.00 |
| 48 | 1910.42 | 1909.18 | 0.0000 | 0.00 |
| 49 | 2023.01 | 2021.67 | 0.0000 | 0.00 |
| 50 | 2103.11 | 2101.69 | 0.0000 | 0.00 |
| 51 | 2109.65 | 2108.22 | 0.0000 | 0.00 |
| 52 | 2177.34 | 2175.85 | 0.0000 | 0.00 |
| 53 | 2205.16 | 2203.64 | 0.0000 | 0.00 |
| 54 | 2218.27 | 2216.74 | 0.0000 | 0.00 |
| 55 | 2344.82 | 2343.17 | 0.0000 | 0.00 |
| 56 | 2378.35 | 2376.67 | 0.0000 | 0.00 |
| 57 | 2418.22 | 2416.50 | 0.0000 | 0.00 |
| 58 | 2465.39 | 2463.62 | 0.0000 | 0.00 |
| 59 | 2615.00 | 2613.10 | 0.0000 | 0.00 |

? = Adjacent peak noted
Errors quoted at 2.000sigma

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 2:11:52PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|---|
| m | 1 | 71.62 | 61 - | 82 | 72.22 | 8.03E+01 | 80.40 | 1.27E+03 | 1.81 |
| m | 2 | 74.69 | 61 - | 82 | 75.28 | 4.65E+02 | 94.10 | 1.28E+03 | 1.81 |
| m | 3 | 77.09 | 61 - | 82 | 77.69 | 6.82E+02 | 100.83 | 1.28E+03 | 1.82 |
| M | 4 | 87.74 | 84 - | 98 | 88.32 | 2.29E+02 | 79.92 | 1.26E+03 | 1.83 |
| m | 5 | 92.44 | 84 - | 98 | 93.02 | 3.86E+02 | 94.71 | 1.33E+03 | 1.84 |
| | 6 | 144.38 | 141 - | 147 | 144.91 | 9.92E+01 | 76.17 | 9.76E+02 | 3.26 |
| | 7 | 186.02 | 183 - | 189 | 186.50 | 1.95E+02 | 76.96 | 9.23E+02 | 1.78 |
| | 8 | 209.78 | 207 - | 213 | 210.24 | 8.97E+01 | 69.74 | 8.01E+02 | 1.52 |
| M | 9 | 238.63 | 234 - | 247 | 239.05 | 9.59E+02 | 76.66 | 4.99E+02 | 1.71 |
| m | 10 | 241.74 | 234 - | 247 | 242.17 | 2.42E+02 | 77.82 | 3.98E+02 | 1.82 |
| | 11 | 269.65 | 266 - | 274 | 270.04 | 9.89E+01 | 67.31 | 6.40E+02 | 2.12 |
| M | 12 | 295.32 | 291 - | 303 | 295.69 | 3.14E+02 | 51.46 | 2.96E+02 | 1.75 |
| m | 13 | 300.08 | 291 - | 303 | 300.44 | 9.54E+01 | 53.08 | 4.24E+02 | 2.20 |
| | 14 | 338.40 | 335 - | 342 | 338.72 | 2.00E+02 | 56.50 | 3.96E+02 | 2.06 |
| | 15 | 351.96 | 348 - | 356 | 352.27 | 4.66E+02 | 74.91 | 5.77E+02 | 1.92 |
| | 16 | 463.33 | 460 - | 467 | 463.53 | 5.91E+01 | 45.08 | 2.90E+02 | 2.11 |
| | 17 | 510.60 | 505 - | 516 | 510.75 | 2.00E+02 | 59.09 | 3.37E+02 | 2.64 |
| | 18 | 583.44 | 578 - | 587 | 583.51 | 3.24E+02 | 55.19 | 2.51E+02 | 2.06 |
| | 19 | 596.69 | 592 - | 602 | 596.75 | 5.01E+01 | 44.42 | 2.36E+02 | 2.16 |
| M | 20 | 606.13 | 605 - | 618 | 606.19 | 1.51E+01 | 12.17 | 4.05E+01 | 2.06 |
| m | 21 | 609.38 | 605 - | 618 | 609.43 | 3.59E+02 | 44.41 | 1.17E+02 | 1.83 |
| m | 22 | 613.95 | 605 - | 618 | 614.00 | 2.67E+01 | 30.72 | 1.62E+02 | 1.87 |
| | 23 | 726.45 | 721 - | 732 | 726.38 | 8.17E+01 | 49.44 | 2.67E+02 | 2.27 |
| | 24 | 795.72 | 792 - | 799 | 795.58 | 2.78E+01 | 32.37 | 1.56E+02 | 3.62 |
| | 25 | 877.20 | 874 - | 880 | 876.98 | 2.55E+01 | 22.92 | 7.70E+01 | 3.35 |
| M | 26 | 908.45 | 907 - | 917 | 908.20 | 1.98E+01 | 11.31 | 3.11E+01 | 1.85 |
| m | 27 | 911.45 | 907 - | 917 | 911.20 | 1.92E+02 | 36.25 | 8.15E+01 | 2.20 |
| | 28 | 935.56 | 929 - | 946 | 935.29 | 4.28E+01 | 52.48 | 2.38E+02 | 9.27 |
| | 29 | 951.58 | 948 - | 954 | 951.28 | 2.30E+01 | 26.15 | 1.06E+02 | 1.28 |
| M | 30 | 965.51 | 962 - | 979 | 965.20 | 3.45E+01 | 29.33 | 1.37E+02 | 2.22 |
| m | 31 | 969.51 | 962 - | 979 | 969.20 | 1.36E+02 | 32.22 | 1.01E+02 | 2.01 |
| | 32 | 1063.55 | 1058 - | 1067 | 1063.14 | 4.09E+01 | 32.77 | 1.30E+02 | 5.03 |
| | 33 | 1121.03 | 1115 - | 1126 | 1120.57 | 9.04E+01 | 44.05 | 1.95E+02 | 2.45 |
| | 34 | 1237.83 | 1234 - | 1241 | 1237.25 | 3.47E+01 | 32.86 | 1.59E+02 | 1.86 |
| | 35 | 1378.41 | 1371 - | 1383 | 1377.69 | 5.18E+01 | 25.42 | 5.04E+01 | 3.04 |
| | 36 | 1406.24 | 1399 - | 1411 | 1405.49 | 4.51E+01 | 23.74 | 4.37E+01 | 8.07 |
| M | 37 | 1461.32 | 1454 - | 1468 | 1460.52 | 1.17E+03 | 69.35 | 1.42E+01 | 2.24 |
| m | 38 | 1465.69 | 1454 - | 1468 | 1464.89 | 4.13E+01 | 29.27 | 7.24E+00 | 2.91 |
| | 39 | 1554.28 | 1551 - | 1556 | 1553.39 | 6.82E+00 | 8.43 | 8.36E+00 | 3.42 |
| | 40 | 1588.73 | 1585 - | 1590 | 1587.81 | 9.29E+00 | 11.79 | 1.94E+01 | 2.10 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | FWHM (keV) |
|---|---|---|---|---|---|---|---|---|
| 41 | 1594.61 | 1591 - | 1599 | 1593.68 | 1.51E+01 | 12.03 | 1.18E+01 | 3.75 |
| 42 | 1660.99 | 1655 - | 1665 | 1660.00 | 1.44E+01 | 17.48 | 3.33E+01 | 1.26 |
| 43 | 1679.11 | 1675 - | 1681 | 1678.10 | 7.11E+00 | 6.95 | 3.78E+00 | 2.24 |
| 44 | 1717.83 | 1713 - | 1720 | 1716.79 | 6.00E+00 | 8.49 | 8.00E+00 | 3.25 |
| 45 | 1728.84 | 1722 - | 1732 | 1727.79 | 1.58E+01 | 12.02 | 1.04E+01 | 3.10 |
| 46 | 1765.13 | 1759 - | 1767 | 1764.04 | 5.79E+01 | 20.83 | 3.01E+01 | 1.97 |
| 47 | 1849.32 | 1844 - | 1852 | 1848.14 | 9.80E+00 | 10.99 | 1.04E+01 | 2.77 |
| 48 | 1910.42 | 1906 - | 1912 | 1909.18 | 9.93E+00 | 9.63 | 8.14E+00 | 1.32 |
| 49 | 2023.01 | 2019 - | 2024 | 2021.67 | 9.00E+00 | 6.00 | 0.00E+00 | 3.00 |
| 50 | 2103.11 | 2098 - | 2105 | 2101.69 | 1.22E+01 | 10.95 | 1.16E+01 | 4.17 |
| 51 | 2109.65 | 2106 - | 2111 | 2108.22 | 9.95E+00 | 7.28 | 2.09E+00 | 3.00 |
| 52 | 2177.34 | 2173 - | 2179 | 2175.85 | 7.00E+00 | 6.95 | 4.00E+00 | 3.33 |
| 53 | 2205.16 | 2198 - | 2209 | 2203.64 | 2.92E+01 | 16.00 | 1.56E+01 | 2.29 |
| 54 | 2218.27 | 2212 - | 2219 | 2216.74 | 6.82E+00 | 8.72 | 8.36E+00 | 1.62 |
| 55 | 2344.82 | 2340 - | 2345 | 2343.17 | 6.00E+00 | 4.90 | 0.00E+00 | 2.74 |
| 56 | 2378.35 | 2372 - | 2382 | 2376.67 | 1.12E+01 | 11.34 | 1.16E+01 | 6.87 |
| 57 | 2418.22 | 2413 - | 2419 | 2416.50 | 1.00E+01 | 6.32 | 0.00E+00 | 2.00 |
| 58 | 2465.39 | 2459 - | 2467 | 2463.62 | 7.85E+00 | 7.76 | 4.30E+00 | 5.76 |
| 59 | 2615.00 | 2608 - | 2618 | 2613.10 | 1.14E+02 | 21.35 | 0.00E+00 | 3.05 |

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

# PEAK ANALYSIS REPORT

Peak Analysis Performed on : 8/22/2017 2:11:52PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| m | 1 | 71.62 | 61 - | 82 | 8.03E+01 | 80.40 | 1.27E+03 | 5.87E+01 |
| m | 2 | 74.69 | 61 - | 82 | 4.65E+02 | 94.10 | 1.28E+03 | 5.88E+01 |
| m | 3 | 77.09 | 61 - | 82 | 6.82E+02 | 100.83 | 1.28E+03 | 5.88E+01 |
| M | 4 | 87.74 | 84 - | 98 | 2.29E+02 | 79.92 | 1.26E+03 | 5.84E+01 |
| m | 5 | 92.44 | 84 - | 98 | 3.86E+02 | 94.71 | 1.33E+03 | 5.99E+01 |
| | 6 | 144.38 | 141 - | 147 | 9.92E+01 | 76.17 | 9.76E+02 | 6.04E+01 |
| | 7 | 186.02 | 183 - | 189 | 1.95E+02 | 76.96 | 9.23E+02 | 5.89E+01 |
| | 8 | 209.78 | 207 - | 213 | 8.97E+01 | 69.74 | 8.01E+02 | 5.52E+01 |
| M | 9 | 238.63 | 234 - | 247 | 9.59E+02 | 76.66 | 4.99E+02 | 3.67E+01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Net Peak Area | Net Area Uncertainty | Continuum Counts | Critical Level |
|---|---|---|---|---|---|---|---|---|
| m | 10 | 241.74 | 234 - | 247 | 2.42E+02 | 77.82 | 3.98E+02 | 3.28E+01 |
| | 11 | 269.65 | 266 - | 274 | 9.89E+01 | 67.31 | 6.40E+02 | 5.29E+01 |
| M | 12 | 295.32 | 291 - | 303 | 3.14E+02 | 51.46 | 2.96E+02 | 2.83E+01 |
| m | 13 | 300.08 | 291 - | 303 | 9.54E+01 | 53.08 | 4.24E+02 | 3.38E+01 |
| | 14 | 338.40 | 335 - | 342 | 2.00E+02 | 56.50 | 3.96E+02 | 4.02E+01 |
| | 15 | 351.96 | 348 - | 356 | 4.66E+02 | 74.91 | 5.77E+02 | 5.03E+01 |
| | 16 | 463.33 | 460 - | 467 | 5.91E+01 | 45.08 | 2.90E+02 | 3.48E+01 |
| | 17 | 510.60 | 505 - | 516 | 2.00E+02 | 59.09 | 3.37E+02 | 4.26E+01 |
| | 18 | 583.44 | 578 - | 587 | 3.24E+02 | 55.19 | 2.51E+02 | 3.44E+01 |
| | 19 | 596.69 | 592 - | 602 | 5.01E+01 | 44.42 | 2.36E+02 | 3.46E+01 |
| M | 20 | 606.13 | 605 - | 618 | 1.51E+01 | 12.17 | 4.05E+01 | 1.05E+01 |
| m | 21 | 609.38 | 605 - | 618 | 3.59E+02 | 44.41 | 1.17E+02 | 1.78E+01 |
| m | 22 | 613.95 | 605 - | 618 | 2.67E+01 | 30.72 | 1.62E+02 | 2.09E+01 |
| | 23 | 726.45 | 721 - | 732 | 8.17E+01 | 49.44 | 2.67E+02 | 3.78E+01 |
| | 24 | 795.72 | 792 - | 799 | 2.78E+01 | 32.37 | 1.56E+02 | 2.52E+01 |
| | 25 | 877.20 | 874 - | 880 | 2.55E+01 | 22.92 | 7.70E+01 | 1.69E+01 |
| M | 26 | 908.45 | 907 - | 917 | 1.98E+01 | 11.31 | 3.11E+01 | 9.16E+00 |
| m | 27 | 911.45 | 907 - | 917 | 1.92E+02 | 36.25 | 8.15E+01 | 1.48E+01 |
| | 28 | 935.56 | 929 - | 946 | 4.28E+01 | 52.48 | 2.38E+02 | 4.18E+01 |
| | 29 | 951.58 | 948 - | 954 | 2.30E+01 | 26.15 | 1.06E+02 | 2.00E+01 |
| M | 30 | 965.51 | 962 - | 979 | 3.45E+01 | 29.33 | 1.37E+02 | 1.92E+01 |
| m | 31 | 969.51 | 962 - | 979 | 1.36E+02 | 32.22 | 1.01E+02 | 1.65E+01 |
| | 32 | 1063.55 | 1058 - | 1067 | 4.09E+01 | 32.77 | 1.30E+02 | 2.48E+01 |
| | 33 | 1121.03 | 1115 - | 1126 | 9.04E+01 | 44.05 | 1.95E+02 | 1.90E+01 |
| | 34 | 1237.83 | 1234 - | 1241 | 3.47E+01 | 32.86 | 1.59E+02 | 2.52E+01 |
| | 35 | 1378.41 | 1371 - | 1383 | 5.18E+01 | 25.42 | 5.04E+01 | 1.72E+01 |
| | 36 | 1406.24 | 1399 - | 1411 | 4.51E+01 | 23.74 | 4.37E+01 | 1.61E+01 |
| M | 37 | 1461.32 | 1454 - | 1468 | 1.17E+03 | 69.35 | 1.42E+01 | 6.19E+00 |
| m | 38 | 1465.69 | 1454 - | 1468 | 4.13E+01 | 29.27 | 7.24E+00 | 4.42E+00 |
| | 39 | 1554.28 | 1551 - | 1556 | 6.82E+00 | 8.43 | 8.36E+00 | 5.44E+00 |
| | 40 | 1588.73 | 1585 - | 1590 | 9.29E+00 | 11.79 | 1.94E+01 | 8.30E+00 |
| | 41 | 1594.61 | 1591 - | 1599 | 1.51E+01 | 12.03 | 1.18E+01 | 7.55E+00 |
| | 42 | 1660.99 | 1655 - | 1665 | 1.44E+01 | 17.48 | 3.33E+01 | 1.29E+01 |
| | 43 | 1679.11 | 1675 - | 1681 | 7.11E+00 | 6.95 | 3.78E+00 | 3.66E+00 |
| | 44 | 1717.83 | 1713 - | 1720 | 6.00E+00 | 8.49 | 8.00E+00 | 5.70E+00 |
| | 45 | 1728.84 | 1722 - | 1732 | 1.58E+01 | 12.02 | 1.04E+01 | 7.41E+00 |
| | 46 | 1765.13 | 1759 - | 1767 | 5.79E+01 | 20.83 | 3.01E+01 | 1.17E+01 |
| | 47 | 1849.32 | 1844 - | 1852 | 9.80E+00 | 10.99 | 1.04E+01 | 7.42E+00 |
| | 48 | 1910.42 | 1906 - | 1912 | 9.93E+00 | 9.63 | 8.14E+00 | 5.99E+00 |
| | 49 | 2023.01 | 2019 - | 2024 | 9.00E+00 | 6.00 | 0.00E+00 | 0.00E+00 |
| | 50 | 2103.11 | 2098 - | 2105 | 1.22E+01 | 10.95 | 1.16E+01 | 6.93E+00 |
| | 51 | 2109.65 | 2106 - | 2111 | 9.95E+00 | 7.28 | 2.09E+00 | 2.98E+00 |
| | 52 | 2177.34 | 2173 - | 2179 | 7.00E+00 | 6.95 | 4.00E+00 | 3.70E+00 |
| | 53 | 2205.16 | 2198 - | 2209 | 2.92E+01 | 16.00 | 1.56E+01 | 9.70E+00 |
| | 54 | 2218.27 | 2212 - | 2219 | 6.82E+00 | 8.72 | 8.36E+00 | 5.74E+00 |
| | 55 | 2344.82 | 2340 - | 2345 | 6.00E+00 | 4.90 | 0.00E+00 | 0.00E+00 |
| | 56 | 2378.35 | 2372 - | 2382 | 1.12E+01 | 11.34 | 1.16E+01 | 7.52E+00 |
| | 57 | 2418.22 | 2413 - | 2419 | 1.00E+01 | 6.32 | 0.00E+00 | 0.00E+00 |
| | 58 | 2465.39 | 2459 - | 2467 | 7.85E+00 | 7.76 | 4.30E+00 | 4.42E+00 |
| | 59 | 2615.00 | 2608 - | 2618 | 1.14E+02 | 21.35 | 0.00E+00 | 0.00E+00 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

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

# PEAK WITH NID REPORT

Peak Analysis Performed on : 8/22/2017 2:11:52PM

Peak Analysis From Channel : 1
Peak Analysis To Channel : 4096

Tentative NID Library : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB
Peak Match Tolerance : 1.000 keV

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| m | 1 | 71.62 | 61 - | 82 | 72.22 | 8.03E+01 | 80.40 | 1.27E+03 | PM-145 |
| m | 2 | 74.69 | 61 - | 82 | 75.28 | 4.65E+02 | 94.10 | 1.28E+03 | AM-243 |
| m | 3 | 77.09 | 61 - | 82 | 77.69 | 6.82E+02 | 100.83 | 1.28E+03 | ..... |
| M | 4 | 87.74 | 84 - | 98 | 88.32 | 2.29E+02 | 79.92 | 1.26E+03 | SN-126 |
| | | | | | | | | | CD-109 |
| | | | | | | | | | LU-176 |
| m | 5 | 92.44 | 84 - | 98 | 93.02 | 3.86E+02 | 94.71 | 1.33E+03 | GA-67 |
| | 6 | 144.38 | 141 - | 147 | 144.91 | 9.92E+01 | 76.17 | 9.76E+02 | U-235 |
| | 7 | 186.02 | 183 - | 189 | 186.50 | 1.95E+02 | 76.96 | 9.23E+02 | RA-226 |
| | 8 | 209.78 | 207 - | 213 | 210.24 | 8.97E+01 | 69.74 | 8.01E+02 | CM-243 |
| | | | | | | | | | GA-67 |
| M | 9 | 238.63 | 234 - | 247 | 239.05 | 9.59E+02 | 76.66 | 4.99E+02 | PB-212 |
| m | 10 | 241.74 | 234 - | 247 | 242.17 | 2.42E+02 | 77.82 | 3.98E+02 | RA-224 |
| | 11 | 269.65 | 266 - | 274 | 270.04 | 9.89E+01 | 67.31 | 6.40E+02 | ..... |
| M | 12 | 295.32 | 291 - | 303 | 295.69 | 3.14E+02 | 51.46 | 2.96E+02 | PB-214 |
| m | 13 | 300.08 | 291 - | 303 | 300.44 | 9.54E+01 | 53.08 | 4.24E+02 | PB-212 |
| | | | | | | | | | BI-210M |
| | | | | | | | | | GA-67 |
| | 14 | 338.40 | 335 - | 342 | 338.72 | 2.00E+02 | 56.50 | 3.96E+02 | AC-228 |
| | 15 | 351.96 | 348 - | 356 | 352.27 | 4.66E+02 | 74.91 | 5.77E+02 | PB-214 |
| | 16 | 463.33 | 460 - | 467 | 463.53 | 5.91E+01 | 45.08 | 2.90E+02 | SB-125 |
| | 17 | 510.60 | 505 - | 516 | 510.75 | 2.00E+02 | 59.09 | 3.37E+02 | ..... |
| | 18 | 583.44 | 578 - | 587 | 583.51 | 3.24E+02 | 55.19 | 2.51E+02 | TL-208 |
| | 19 | 596.69 | 592 - | 602 | 596.75 | 5.01E+01 | 44.42 | 2.36E+02 | ..... |
| M | 20 | 606.13 | 605 - | 618 | 606.19 | 1.51E+01 | 12.17 | 4.05E+01 | ..... |
| m | 21 | 609.38 | 605 - | 618 | 609.43 | 3.59E+02 | 44.41 | 1.17E+02 | BI-214 |
| m | 22 | 613.95 | 605 - | 618 | 614.00 | 2.67E+01 | 30.72 | 1.62E+02 | AG-108M |
| | 23 | 726.45 | 721 - | 732 | 726.38 | 8.17E+01 | 49.44 | 2.67E+02 | BI-212 |
| | 24 | 795.72 | 792 - | 799 | 795.58 | 2.78E+01 | 32.37 | 1.56E+02 | CS-134 |
| | 25 | 877.20 | 874 - | 880 | 876.98 | 2.55E+01 | 22.92 | 7.70E+01 | ..... |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Peak No. | Energy (keV) | ROI start | ROI end | Peak Centroid | Net Peak Area | Net Area Uncertainty | Continuum Counts | Tentative Nuclide |
|---|---|---|---|---|---|---|---|---|---|
| M | 26 | 908.45 | 907 - | 917 | 908.20 | 1.98E+01 | 11.31 | 3.11E+01 | ..... |
| m | 27 | 911.45 | 907 - | 917 | 911.20 | 1.92E+02 | 36.25 | 8.15E+01 | TL-204<br>AC-228 |
| | 28 | 935.56 | 929 - | 946 | 935.29 | 4.28E+01 | 52.48 | 2.38E+02 | ..... |
| | 29 | 951.58 | 948 - | 954 | 951.28 | 2.30E+01 | 26.15 | 1.06E+02 | ..... |
| M | 30 | 965.51 | 962 - | 979 | 965.20 | 3.45E+01 | 29.33 | 1.37E+02 | ..... |
| m | 31 | 969.51 | 962 - | 979 | 969.20 | 1.36E+02 | 32.22 | 1.01E+02 | AC-228 |
| | 32 | 1063.55 | 1058 - | 1067 | 1063.14 | 4.09E+01 | 32.77 | 1.30E+02 | BI-207 |
| | 33 | 1121.03 | 1115 - | 1126 | 1120.57 | 9.04E+01 | 44.05 | 1.95E+02 | TA-182<br>SC-46<br>BI-214 |
| | 34 | 1237.83 | 1234 - | 1241 | 1237.25 | 3.47E+01 | 32.86 | 1.59E+02 | CO-56 |
| | 35 | 1378.41 | 1371 - | 1383 | 1377.69 | 5.18E+01 | 25.42 | 5.04E+01 | ..... |
| | 36 | 1406.24 | 1399 - | 1411 | 1405.49 | 4.51E+01 | 23.74 | 4.37E+01 | ..... |
| M | 37 | 1461.32 | 1454 - | 1468 | 1460.52 | 1.17E+03 | 69.35 | 1.42E+01 | K-40 |
| m | 38 | 1465.69 | 1454 - | 1468 | 1464.89 | 4.13E+01 | 29.27 | 7.24E+00 | ..... |
| | 39 | 1554.28 | 1551 - | 1556 | 1553.39 | 6.82E+00 | 8.43 | 8.36E+00 | ..... |
| | 40 | 1588.73 | 1585 - | 1590 | 1587.81 | 9.29E+00 | 11.79 | 1.94E+01 | ..... |
| | 41 | 1594.61 | 1591 - | 1599 | 1593.68 | 1.51E+01 | 12.03 | 1.18E+01 | ..... |
| | 42 | 1660.99 | 1655 - | 1665 | 1660.00 | 1.44E+01 | 17.48 | 3.33E+01 | ..... |
| | 43 | 1679.11 | 1675 - | 1681 | 1678.10 | 7.11E+00 | 6.95 | 3.78E+00 | ..... |
| | 44 | 1717.83 | 1713 - | 1720 | 1716.79 | 6.00E+00 | 8.49 | 8.00E+00 | ..... |
| | 45 | 1728.84 | 1722 - | 1732 | 1727.79 | 1.58E+01 | 12.02 | 1.04E+01 | ..... |
| | 46 | 1765.13 | 1759 - | 1767 | 1764.04 | 5.79E+01 | 20.83 | 3.01E+01 | BI-214 |
| | 47 | 1849.32 | 1844 - | 1852 | 1848.14 | 9.80E+00 | 10.99 | 1.04E+01 | ..... |
| | 48 | 1910.42 | 1906 - | 1912 | 1909.18 | 9.93E+00 | 9.63 | 8.14E+00 | ..... |
| | 49 | 2023.01 | 2019 - | 2024 | 2021.67 | 9.00E+00 | 6.00 | 0.00E+00 | ..... |
| | 50 | 2103.11 | 2098 - | 2105 | 2101.69 | 1.22E+01 | 10.95 | 1.16E+01 | ..... |
| | 51 | 2109.65 | 2106 - | 2111 | 2108.22 | 9.95E+00 | 7.28 | 2.09E+00 | ..... |
| | 52 | 2177.34 | 2173 - | 2179 | 2175.85 | 7.00E+00 | 6.95 | 4.00E+00 | ..... |
| | 53 | 2205.16 | 2198 - | 2209 | 2203.64 | 2.92E+01 | 16.00 | 1.56E+01 | BI-214 |
| | 54 | 2218.27 | 2212 - | 2219 | 2216.74 | 6.82E+00 | 8.72 | 8.36E+00 | ..... |
| | 55 | 2344.82 | 2340 - | 2345 | 2343.17 | 6.00E+00 | 4.90 | 0.00E+00 | ..... |
| | 56 | 2378.35 | 2372 - | 2382 | 2376.67 | 1.12E+01 | 11.34 | 1.16E+01 | ..... |
| | 57 | 2418.22 | 2413 - | 2419 | 2416.50 | 1.00E+01 | 6.32 | 0.00E+00 | ..... |
| | 58 | 2465.39 | 2459 - | 2467 | 2463.62 | 7.85E+00 | 7.76 | 4.30E+00 | ..... |
| | 59 | 2615.00 | 2608 - | 2618 | 2613.10 | 1.14E+02 | 21.35 | 0.00E+00 | TL-208 |

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

# PEAK EFFICIENCY REPORT

Peak Analysis Performed on : 8/22/2017 2:11:52PM

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|---|
| m | 1 | 71.62 | 8.03E+01 | 80.40 | 2.74E-02 | 2.35E-03 |
| m | 2 | 74.69 | 4.65E+02 | 94.10 | 2.75E-02 | 2.38E-03 |
| m | 3 | 77.09 | 6.82E+02 | 100.83 | 2.75E-02 | 2.40E-03 |
| M | 4 | 87.74 | 2.29E+02 | 79.92 | 2.74E-02 | 2.52E-03 |
| m | 5 | 92.44 | 3.86E+02 | 94.71 | 2.73E-02 | 2.45E-03 |
| | 6 | 144.38 | 9.92E+01 | 76.17 | 2.44E-02 | 1.85E-03 |
| | 7 | 186.02 | 1.95E+02 | 76.96 | 2.17E-02 | 1.68E-03 |
| | 8 | 209.78 | 8.97E+01 | 69.74 | 2.03E-02 | 1.61E-03 |
| M | 9 | 238.63 | 9.59E+02 | 76.66 | 1.89E-02 | 1.53E-03 |
| m | 10 | 241.74 | 2.42E+02 | 77.82 | 1.87E-02 | 1.52E-03 |
| | 11 | 269.65 | 9.89E+01 | 67.31 | 1.75E-02 | 1.44E-03 |
| M | 12 | 295.32 | 3.14E+02 | 51.46 | 1.64E-02 | 1.37E-03 |
| m | 13 | 300.08 | 9.54E+01 | 53.08 | 1.63E-02 | 1.36E-03 |
| | 14 | 338.40 | 2.00E+02 | 56.50 | 1.50E-02 | 1.27E-03 |
| | 15 | 351.96 | 4.66E+02 | 74.91 | 1.45E-02 | 1.24E-03 |
| | 16 | 463.33 | 5.91E+01 | 45.08 | 1.19E-02 | 1.10E-03 |
| | 17 | 510.60 | 2.00E+02 | 59.09 | 1.10E-02 | 1.07E-03 |
| | 18 | 583.44 | 3.24E+02 | 55.19 | 9.96E-03 | 1.02E-03 |
| | 19 | 596.69 | 5.01E+01 | 44.42 | 9.79E-03 | 1.01E-03 |
| M | 20 | 606.13 | 1.51E+01 | 12.17 | 9.67E-03 | 1.01E-03 |
| m | 21 | 609.38 | 3.59E+02 | 44.41 | 9.63E-03 | 1.01E-03 |
| m | 22 | 613.95 | 2.67E+01 | 30.72 | 9.58E-03 | 1.00E-03 |
| | 23 | 726.45 | 8.17E+01 | 49.44 | 8.42E-03 | 8.69E-04 |
| | 24 | 795.72 | 2.78E+01 | 32.37 | 7.85E-03 | 7.59E-04 |
| | 25 | 877.20 | 2.55E+01 | 22.92 | 7.29E-03 | 6.30E-04 |
| M | 26 | 908.45 | 1.98E+01 | 11.31 | 7.10E-03 | 5.92E-04 |
| m | 27 | 911.45 | 1.92E+02 | 36.25 | 7.08E-03 | 5.91E-04 |
| | 28 | 935.56 | 4.28E+01 | 52.48 | 6.95E-03 | 5.82E-04 |
| | 29 | 951.58 | 2.30E+01 | 26.15 | 6.86E-03 | 5.76E-04 |
| M | 30 | 965.51 | 3.45E+01 | 29.33 | 6.78E-03 | 5.71E-04 |
| m | 31 | 969.51 | 1.36E+02 | 32.22 | 6.76E-03 | 5.69E-04 |
| | 32 | 1063.55 | 4.09E+01 | 32.77 | 6.31E-03 | 5.33E-04 |
| | 33 | 1121.03 | 9.04E+01 | 44.05 | 6.07E-03 | 5.11E-04 |
| | 34 | 1237.83 | 3.47E+01 | 32.86 | 5.64E-03 | 4.76E-04 |
| | 35 | 1378.41 | 5.18E+01 | 25.42 | 5.22E-03 | 4.44E-04 |
| | 36 | 1406.24 | 4.51E+01 | 23.74 | 5.15E-03 | 4.37E-04 |
| M | 37 | 1461.32 | 1.17E+03 | 69.35 | 5.00E-03 | 4.25E-04 |
| m | 38 | 1465.69 | 4.13E+01 | 29.27 | 4.99E-03 | 4.24E-04 |
| | 39 | 1554.28 | 6.82E+00 | 8.43 | 4.79E-03 | 4.03E-04 |
| | 40 | 1588.73 | 9.29E+00 | 11.79 | 4.71E-03 | 3.95E-04 |
| | 41 | 1594.61 | 1.51E+01 | 12.03 | 4.70E-03 | 3.94E-04 |
| | 42 | 1660.99 | 1.44E+01 | 17.48 | 4.57E-03 | 3.78E-04 |
| | 43 | 1679.11 | 7.11E+00 | 6.95 | 4.53E-03 | 3.74E-04 |
| | 44 | 1717.83 | 6.00E+00 | 8.49 | 4.46E-03 | 3.65E-04 |
| | 45 | 1728.84 | 1.58E+01 | 12.02 | 4.44E-03 | 3.63E-04 |
| | 46 | 1765.13 | 5.79E+01 | 20.83 | 4.37E-03 | 3.54E-04 |
| | 47 | 1849.32 | 9.80E+00 | 10.99 | 4.23E-03 | 3.38E-04 |
| | 48 | 1910.42 | 9.93E+00 | 9.63 | 4.14E-03 | 3.38E-04 |
| | 49 | 2023.01 | 9.00E+00 | 6.00 | 3.97E-03 | 3.38E-04 |
| | 50 | 2103.11 | 1.22E+01 | 10.95 | 3.86E-03 | 3.38E-04 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| Peak No. | Energy (keV) | Net Peak Area | Net Area Uncertainty | Peak Efficiency | Efficiency Uncertainty |
|---|---|---|---|---|---|
| 51 | 2109.65 | 9.95E+00 | 7.28 | 3.85E-03 | 3.38E-04 |
| 52 | 2177.34 | 7.00E+00 | 6.95 | 3.77E-03 | 3.38E-04 |
| 53 | 2205.16 | 2.92E+01 | 16.00 | 3.74E-03 | 3.38E-04 |
| 54 | 2218.27 | 6.82E+00 | 8.72 | 3.72E-03 | 3.38E-04 |
| 55 | 2344.82 | 6.00E+00 | 4.90 | 3.58E-03 | 3.38E-04 |
| 56 | 2378.35 | 1.12E+01 | 11.34 | 3.54E-03 | 3.38E-04 |
| 57 | 2418.22 | 1.00E+01 | 6.32 | 3.50E-03 | 3.38E-04 |
| 58 | 2465.39 | 7.85E+00 | 7.76 | 3.45E-03 | 3.38E-04 |
| 59 | 2615.00 | 1.14E+02 | 21.35 | 3.31E-03 | 3.38E-04 |

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

# BACKGROUND SUBTRACT REPORT

Peak Analysis Performed on : 8/22/2017 2:11:52PM

Env. Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| m | 1 | 71.62 | 8.03E+01 | 80.40 | | | 8.03E+01 | 8.04E+01 |
| m | 2 | 74.69 | 4.65E+02 | 94.10 | | | 4.65E+02 | 9.41E+01 |
| m | 3 | 77.09 | 6.82E+02 | 100.83 | 7.20E+00 | 1.47E+00 | 6.74E+02 | 1.01E+02 |
| M | 4 | 87.74 | 2.29E+02 | 79.92 | | | 2.29E+02 | 7.99E+01 |
| m | 5 | 92.44 | 3.86E+02 | 94.71 | 1.38E+02 | 1.72E+01 | 2.49E+02 | 9.63E+01 |
| | 6 | 144.38 | 9.92E+01 | 76.17 | 1.21E+01 | 4.29E+01 | 8.71E+01 | 8.74E+01 |
| | 7 | 186.02 | 1.95E+02 | 76.96 | 5.22E+01 | 7.59E+00 | 1.43E+02 | 7.73E+01 |
| | 8 | 209.78 | 8.97E+01 | 69.74 | | | 8.97E+01 | 6.97E+01 |
| M | 9 | 238.63 | 9.59E+02 | 76.66 | 2.13E+01 | 6.33E+00 | 9.37E+02 | 7.69E+01 |
| m | 10 | 241.74 | 2.42E+02 | 77.82 | | | 2.42E+02 | 7.78E+01 |
| | 11 | 269.65 | 9.89E+01 | 67.31 | 1.23E+00 | 4.98E+00 | 9.77E+01 | 6.75E+01 |
| M | 12 | 295.32 | 3.14E+02 | 51.46 | | | 3.14E+02 | 5.15E+01 |
| m | 13 | 300.08 | 9.54E+01 | 53.08 | | | 9.54E+01 | 5.31E+01 |
| | 14 | 338.40 | 2.00E+02 | 56.50 | | | 2.00E+02 | 5.65E+01 |
| | 15 | 351.96 | 4.66E+02 | 74.91 | 5.79E+00 | 4.49E+00 | 4.61E+02 | 7.50E+01 |
| | 16 | 463.33 | 5.91E+01 | 45.08 | | | 5.91E+01 | 4.51E+01 |
| | 17 | 510.60 | 2.00E+02 | 59.09 | 7.28E+01 | 5.30E+00 | 1.28E+02 | 5.93E+01 |
| | 18 | 583.44 | 3.24E+02 | 55.19 | 2.72E+00 | 3.05E+00 | 3.21E+02 | 5.53E+01 |
| | 19 | 596.69 | 5.01E+01 | 44.42 | | | 5.01E+01 | 4.44E+01 |
| M | 20 | 606.13 | 1.51E+01 | 12.17 | | | 1.51E+01 | 1.22E+01 |
| m | 21 | 609.38 | 3.59E+02 | 44.41 | 6.35E+00 | 4.02E+00 | 3.53E+02 | 4.46E+01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Subtracted Area | Subtracted Uncert. |
|---|---|---|---|---|---|---|---|---|
| m | 22 | 613.95 | 2.67E+01 | 30.72 | | | 2.67E+01 | 3.07E+01 |
| | 23 | 726.45 | 8.17E+01 | 49.44 | | | 8.17E+01 | 4.94E+01 |
| | 24 | 795.72 | 2.78E+01 | 32.37 | | | 2.78E+01 | 3.24E+01 |
| | 25 | 877.20 | 2.55E+01 | 22.92 | | | 2.55E+01 | 2.29E+01 |
| M | 26 | 908.45 | 1.98E+01 | 11.31 | | | 1.98E+01 | 1.13E+01 |
| m | 27 | 911.45 | 1.92E+02 | 36.25 | 5.31E+00 | 3.00E+00 | 1.86E+02 | 3.64E+01 |
| | 28 | 935.56 | 4.28E+01 | 52.48 | | | 4.28E+01 | 5.25E+01 |
| | 29 | 951.58 | 2.30E+01 | 26.15 | | | 2.30E+01 | 2.61E+01 |
| M | 30 | 965.51 | 3.45E+01 | 29.33 | | | 3.45E+01 | 2.93E+01 |
| m | 31 | 969.51 | 1.36E+02 | 32.22 | | | 1.36E+02 | 3.22E+01 |
| | 32 | 1063.55 | 4.09E+01 | 32.77 | | | 4.09E+01 | 3.28E+01 |
| | 33 | 1121.03 | 9.04E+01 | 44.05 | | | 9.04E+01 | 4.40E+01 |
| | 34 | 1237.83 | 3.47E+01 | 32.86 | | | 3.47E+01 | 3.29E+01 |
| | 35 | 1378.41 | 5.18E+01 | 25.42 | | | 5.18E+01 | 2.54E+01 |
| | 36 | 1406.24 | 4.51E+01 | 23.74 | | | 4.51E+01 | 2.37E+01 |
| M | 37 | 1461.32 | 1.17E+03 | 69.35 | 8.09E+00 | 2.23E+00 | 1.16E+03 | 6.94E+01 |
| m | 38 | 1465.69 | 4.13E+01 | 29.27 | | | 4.13E+01 | 2.93E+01 |
| | 39 | 1554.28 | 6.82E+00 | 8.43 | | | 6.82E+00 | 8.43E+00 |
| | 40 | 1588.73 | 9.29E+00 | 11.79 | | | 9.29E+00 | 1.18E+01 |
| | 41 | 1594.61 | 1.51E+01 | 12.03 | | | 1.51E+01 | 1.20E+01 |
| | 42 | 1660.99 | 1.44E+01 | 17.48 | | | 1.44E+01 | 1.75E+01 |
| | 43 | 1679.11 | 7.11E+00 | 6.95 | | | 7.11E+00 | 6.95E+00 |
| | 44 | 1717.83 | 6.00E+00 | 8.49 | | | 6.00E+00 | 8.49E+00 |
| | 45 | 1728.84 | 1.58E+01 | 12.02 | | | 1.58E+01 | 1.20E+01 |
| | 46 | 1765.13 | 5.79E+01 | 20.83 | | | 5.79E+01 | 2.08E+01 |
| | 47 | 1849.32 | 9.80E+00 | 10.99 | | | 9.80E+00 | 1.10E+01 |
| | 48 | 1910.42 | 9.93E+00 | 9.63 | | | 9.93E+00 | 9.63E+00 |
| | 49 | 2023.01 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| | 50 | 2103.11 | 1.22E+01 | 10.95 | | | 1.22E+01 | 1.10E+01 |
| | 51 | 2109.65 | 9.95E+00 | 7.28 | | | 9.95E+00 | 7.28E+00 |
| | 52 | 2177.34 | 7.00E+00 | 6.95 | | | 7.00E+00 | 6.95E+00 |
| | 53 | 2205.16 | 2.92E+01 | 16.00 | | | 2.92E+01 | 1.60E+01 |
| | 54 | 2218.27 | 6.82E+00 | 8.72 | | | 6.82E+00 | 8.72E+00 |
| | 55 | 2344.82 | 6.00E+00 | 4.90 | | | 6.00E+00 | 4.90E+00 |
| | 56 | 2378.35 | 1.12E+01 | 11.34 | | | 1.12E+01 | 1.13E+01 |
| | 57 | 2418.22 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| | 58 | 2465.39 | 7.85E+00 | 7.76 | | | 7.85E+00 | 7.76E+00 |
| | 59 | 2615.00 | 1.14E+02 | 21.35 | 5.63E+00 | 1.38E+00 | 1.08E+02 | 2.14E+01 |

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

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

# AREA CORRECTION REPORT
# REFERENCE PEAK / BKG. SUBTRACT

Peak Analysis Performed on : 8/22/2017 2:11:52PM

Ref. Peak Energy : 0.00 Reference Date :
Peak Ratio : 0.00 Uncertainty : 0.00
Background File : \\OR-GAMMA1\ApexRoot\Countroom\Data\0000055573.CNF

Corrected Area is: Original * Peak Ratio - Background

| | Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|---|
| m | 1 | 71.62 | 8.03E+01 | 80.40 | | | 8.03E+01 | 8.04E+01 |
| m | 2 | 74.69 | 4.65E+02 | 94.10 | | | 4.65E+02 | 9.41E+01 |
| m | 3 | 77.09 | 6.82E+02 | 100.83 | 7.20E+00 | 1.47E+00 | 6.74E+02 | 1.01E+02 |
| M | 4 | 87.74 | 2.29E+02 | 79.92 | | | 2.29E+02 | 7.99E+01 |
| m | 5 | 92.44 | 3.86E+02 | 94.71 | 1.38E+02 | 1.72E+01 | 2.49E+02 | 9.63E+01 |
| | 6 | 144.38 | 9.92E+01 | 76.17 | 1.21E+01 | 4.29E+01 | 8.71E+01 | 8.74E+01 |
| | 7 | 186.02 | 1.95E+02 | 76.96 | 5.22E+01 | 7.59E+00 | 1.43E+02 | 7.73E+01 |
| | 8 | 209.78 | 8.97E+01 | 69.74 | | | 8.97E+01 | 6.97E+01 |
| M | 9 | 238.63 | 9.59E+02 | 76.66 | 2.13E+01 | 6.33E+00 | 9.37E+02 | 7.69E+01 |
| m | 10 | 241.74 | 2.42E+02 | 77.82 | | | 2.42E+02 | 7.78E+01 |
| | 11 | 269.65 | 9.89E+01 | 67.31 | 1.23E+00 | 4.98E+00 | 9.77E+01 | 6.75E+01 |
| M | 12 | 295.32 | 3.14E+02 | 51.46 | | | 3.14E+02 | 5.15E+01 |
| m | 13 | 300.08 | 9.54E+01 | 53.08 | | | 9.54E+01 | 5.31E+01 |
| | 14 | 338.40 | 2.00E+02 | 56.50 | | | 2.00E+02 | 5.65E+01 |
| | 15 | 351.96 | 4.66E+02 | 74.91 | 5.79E+00 | 4.49E+00 | 4.61E+02 | 7.50E+01 |
| | 16 | 463.33 | 5.91E+01 | 45.08 | | | 5.91E+01 | 4.51E+01 |
| | 17 | 510.60 | 2.00E+02 | 59.09 | 7.28E+01 | 5.30E+00 | 1.28E+02 | 5.93E+01 |
| | 18 | 583.44 | 3.24E+02 | 55.19 | 2.72E+00 | 3.05E+00 | 3.21E+02 | 5.53E+01 |
| | 19 | 596.69 | 5.01E+01 | 44.42 | | | 5.01E+01 | 4.44E+01 |
| M | 20 | 606.13 | 1.51E+01 | 12.17 | | | 1.51E+01 | 1.22E+01 |
| m | 21 | 609.38 | 3.59E+02 | 44.41 | 6.35E+00 | 4.02E+00 | 3.53E+02 | 4.46E+01 |
| m | 22 | 613.95 | 2.67E+01 | 30.72 | | | 2.67E+01 | 3.07E+01 |
| | 23 | 726.45 | 8.17E+01 | 49.44 | | | 8.17E+01 | 4.94E+01 |
| | 24 | 795.72 | 2.78E+01 | 32.37 | | | 2.78E+01 | 3.24E+01 |
| | 25 | 877.20 | 2.55E+01 | 22.92 | | | 2.55E+01 | 2.29E+01 |
| M | 26 | 908.45 | 1.98E+01 | 11.31 | | | 1.98E+01 | 1.13E+01 |
| m | 27 | 911.45 | 1.92E+02 | 36.25 | 5.31E+00 | 3.00E+00 | 1.86E+02 | 3.64E+01 |
| | 28 | 935.56 | 4.28E+01 | 52.48 | | | 4.28E+01 | 5.25E+01 |
| | 29 | 951.58 | 2.30E+01 | 26.15 | | | 2.30E+01 | 2.61E+01 |
| M | 30 | 965.51 | 3.45E+01 | 29.33 | | | 3.45E+01 | 2.93E+01 |
| m | 31 | 969.51 | 1.36E+02 | 32.22 | | | 1.36E+02 | 3.22E+01 |
| | 32 | 1063.55 | 4.09E+01 | 32.77 | | | 4.09E+01 | 3.28E+01 |
| | 33 | 1121.03 | 9.04E+01 | 44.05 | | | 9.04E+01 | 4.40E+01 |
| | 34 | 1237.83 | 3.47E+01 | 32.86 | | | 3.47E+01 | 3.29E+01 |
| | 35 | 1378.41 | 5.18E+01 | 25.42 | | | 5.18E+01 | 2.54E+01 |
| | 36 | 1406.24 | 4.51E+01 | 23.74 | | | 4.51E+01 | 2.37E+01 |
| M | 37 | 1461.32 | 1.17E+03 | 69.35 | 8.09E+00 | 2.23E+00 | 1.16E+03 | 6.94E+01 |
| m | 38 | 1465.69 | 4.13E+01 | 29.27 | | | 4.13E+01 | 2.93E+01 |
| | 39 | 1554.28 | 6.82E+00 | 8.43 | | | 6.82E+00 | 8.43E+00 |
| | 40 | 1588.73 | 9.29E+00 | 11.79 | | | 9.29E+00 | 1.18E+01 |
| | 41 | 1594.61 | 1.51E+01 | 12.03 | | | 1.51E+01 | 1.20E+01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| Peak No. | Energy (keV) | Original Area | Orig. Area Uncertainty | Ambient Background | Backgr. Uncert. | Corrected Area | Corrected Uncert. |
|---|---|---|---|---|---|---|---|
| 42 | 1660.99 | 1.44E+01 | 17.48 | | | 1.44E+01 | 1.75E+01 |
| 43 | 1679.11 | 7.11E+00 | 6.95 | | | 7.11E+00 | 6.95E+00 |
| 44 | 1717.83 | 6.00E+00 | 8.49 | | | 6.00E+00 | 8.49E+00 |
| 45 | 1728.84 | 1.58E+01 | 12.02 | | | 1.58E+01 | 1.20E+01 |
| 46 | 1765.13 | 5.79E+01 | 20.83 | | | 5.79E+01 | 2.08E+01 |
| 47 | 1849.32 | 9.80E+00 | 10.99 | | | 9.80E+00 | 1.10E+01 |
| 48 | 1910.42 | 9.93E+00 | 9.63 | | | 9.93E+00 | 9.63E+00 |
| 49 | 2023.01 | 9.00E+00 | 6.00 | | | 9.00E+00 | 6.00E+00 |
| 50 | 2103.11 | 1.22E+01 | 10.95 | | | 1.22E+01 | 1.10E+01 |
| 51 | 2109.65 | 9.95E+00 | 7.28 | | | 9.95E+00 | 7.28E+00 |
| 52 | 2177.34 | 7.00E+00 | 6.95 | | | 7.00E+00 | 6.95E+00 |
| 53 | 2205.16 | 2.92E+01 | 16.00 | | | 2.92E+01 | 1.60E+01 |
| 54 | 2218.27 | 6.82E+00 | 8.72 | | | 6.82E+00 | 8.72E+00 |
| 55 | 2344.82 | 6.00E+00 | 4.90 | | | 6.00E+00 | 4.90E+00 |
| 56 | 2378.35 | 1.12E+01 | 11.34 | | | 1.12E+01 | 1.13E+01 |
| 57 | 2418.22 | 1.00E+01 | 6.32 | | | 1.00E+01 | 6.32E+00 |
| 58 | 2465.39 | 7.85E+00 | 7.76 | | | 7.85E+00 | 7.76E+00 |
| 59 | 2615.00 | 1.14E+02 | 21.35 | 5.63E+00 | 1.38E+00 | 1.08E+02 | 2.14E+01 |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.960 | 1460.81 | * | 10.67 | 2.38E+01 | 2.52E+00 |
| CD-109 | 0.986 | 88.03 | * | 3.72 | 2.86E+00 | 1.05E+00 |
| SN-126 | 0.995 | 87.57 | * | 37.00 | 2.48E-01 | 8.94E-02 |
| TL-208 | 0.871 | 583.14 | * | 30.22 | 1.17E+00 | 2.35E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 1.00E+00 | 2.23E-01 |
| BI-212 | 0.699 | 727.17 | * | 11.80 | 9.03E-01 | 5.54E-01 |
| | | 1620.62 | | 2.75 | | |
| PB-212 | 1.000 | 238.63 | * | 44.60 | 1.22E+00 | 1.41E-01 |
| | | 300.09 | * | 3.41 | 1.89E+00 | 1.06E+00 |
| BI-214 | 0.963 | 609.31 | * | 46.30 | 8.68E-01 | 1.42E-01 |
| | | 1120.29 | * | 15.10 | 1.08E+00 | 5.35E-01 |
| | | 1764.49 | * | 15.80 | 9.20E-01 | 3.39E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| BI-214 | 0.963 | 2204.22 | * | 4.98 | 1.72E+00 | 9.57E-01 |
| PB-214 | 0.999 | 295.21 | * | 19.19 | 1.09E+00 | 2.01E-01 |
| | | 351.92 | * | 37.19 | 9.35E-01 | 1.72E-01 |
| RA-224 | 0.911 | 240.98 | * | 3.95 | 3.59E+00 | 1.19E+00 |
| RA-226 | 0.994 | 186.21 | * | 3.28 | 2.21E+00 | 4.21E+00 |
| AC-228 | 0.981 | 338.32 | * | 11.40 | 1.29E+00 | 3.80E-01 |
| | | 911.07 | * | 27.70 | 1.04E+00 | 2.21E-01 |
| | | 969.11 | * | 16.60 | 1.33E+00 | 3.34E-01 |
| AM-243 | 1.000 | 74.67 | * | 66.00 | 2.82E-01 | 6.20E-02 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

## UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 2:11:52PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| m | 1 | 71.62 | 2.23010E-02 | 50.07 | Tol. | PM-145 |
| m | 3 | 77.09 | 1.87341E-01 | 7.48 | | |
| m | 5 | 92.44 | 6.91052E-02 | 19.34 | | |
| | 6 | 144.38 | 2.42045E-02 | 50.15 | Tol. | U-235 |
| | 8 | 209.78 | 2.49167E-02 | 38.87 | Tol. | CM-243 |
| | 11 | 269.65 | 2.71434E-02 | 34.54 | | |
| | 16 | 463.33 | 1.64188E-02 | 38.13 | Tol. | SB-125 |
| | 17 | 510.60 | 3.54588E-02 | 23.24 | | |
| | 19 | 596.69 | 1.39145E-02 | 44.33 | | |
| M | 20 | 606.13 | 4.18698E-03 | 40.36 | | |
| m | 22 | 613.95 | 7.40453E-03 | 57.63 | Tol. | AG-108M |
| | 24 | 795.72 | 7.72537E-03 | 58.20 | Sum | |
| | 25 | 877.20 | 7.08333E-03 | 44.95 | | |
| M | 26 | 908.45 | 5.48878E-03 | 28.63 | | |
| | 28 | 935.56 | 1.18827E-02 | 61.34 | Sum | |
| | 29 | 951.58 | 6.37975E-03 | 56.93 | | |
| M | 30 | 965.51 | 9.57566E-03 | 42.55 | Sum | |
| | 32 | 1063.55 | 1.13627E-02 | 40.06 | Tol. | BI-207 |
| | 34 | 1237.83 | 9.64669E-03 | 47.32 | | |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| | 35 | 1378.41 | 1.43939E-02 | 24.52 | | |
| | 36 | 1406.24 | 1.25373E-02 | 26.30 | | |
| m | 38 | 1465.69 | 1.14697E-02 | 35.45 | | |
| | 39 | 1554.28 | 1.89394E-03 | 61.79 | | |
| | 40 | 1588.73 | 2.58041E-03 | 63.46 | | |
| | 41 | 1594.61 | 4.19974E-03 | 39.79 | | |
| | 42 | 1660.99 | 3.98746E-03 | 60.88 | | |
| | 43 | 1679.11 | 1.97531E-03 | 48.84 | | |
| | 44 | 1717.83 | 1.66667E-03 | 70.71 | | |
| | 45 | 1728.84 | 4.39153E-03 | 38.02 | | |
| | 47 | 1849.32 | 2.72222E-03 | 56.06 | | |
| | 48 | 1910.42 | 2.75794E-03 | 48.50 | | |
| | 49 | 2023.01 | 2.50000E-03 | 33.33 | | |
| | 50 | 2103.11 | 3.39506E-03 | 44.81 | S-Esc | |
| | 51 | 2109.65 | 2.76515E-03 | 36.57 | | |
| | 52 | 2177.34 | 1.94444E-03 | 49.62 | | |
| | 54 | 2218.27 | 1.89394E-03 | 63.93 | | |
| | 55 | 2344.82 | 1.66667E-03 | 40.82 | | |
| | 56 | 2378.35 | 3.10458E-03 | 50.71 | | |
| | 57 | 2418.22 | 2.77778E-03 | 31.62 | | |
| | 58 | 2465.39 | 2.18056E-03 | 49.44 | | |

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

# NUCLIDE IDENTIFICATION REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

## IDENTIFIED NUCLIDES

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| K-40 | 0.96 | 1460.81 | * | 10.67 | 2.38E+01 | 2.52E+00 |
| CD-109 | 0.98 | 88.03 | * | 3.72 | 2.86E+00 | 1.05E+00 |
| SN-126 | 0.99 | 87.57 | * | 37.00 | 2.48E-01 | 8.94E-02 |
| TL-208 | 0.87 | 583.14 | * | 30.22 | 1.17E+00 | 2.35E-01 |
| | | 860.37 | | 4.48 | | |
| | | 2614.66 | * | 35.85 | 1.00E+00 | 2.23E-01 |
| BI-212 | 0.69 | 727.17 | * | 11.80 | 9.03E-01 | 5.54E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| Nuclide Name | Id Confidence | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Activity Uncertainty |
|---|---|---|---|---|---|---|
| BI-212 | 0.69 | 1620.62 | | 2.75 | | |
| PB-212 | 1.00 | 238.63 | * | 44.60 | 1.22E+00 | 1.41E-01 |
| | | 300.09 | * | 3.41 | 1.89E+00 | 1.06E+00 |
| BI-214 | 0.96 | 609.31 | * | 46.30 | 8.68E-01 | 1.42E-01 |
| | | 1120.29 | * | 15.10 | 1.08E+00 | 5.35E-01 |
| | | 1764.49 | * | 15.80 | 9.20E-01 | 3.39E-01 |
| | | 2204.22 | * | 4.98 | 1.72E+00 | 9.57E-01 |
| PB-214 | 0.99 | 295.21 | * | 19.19 | 1.09E+00 | 2.01E-01 |
| | | 351.92 | * | 37.19 | 9.35E-01 | 1.72E-01 |
| RA-224 | 0.91 | 240.98 | * | 3.95 | 3.59E+00 | 1.19E+00 |
| RA-226 | 0.99 | 186.21 | * | 3.28 | 2.21E+00 | 4.21E+00 |
| AC-228 | 0.98 | 338.32 | * | 11.40 | 1.29E+00 | 3.80E-01 |
| | | 911.07 | * | 27.70 | 1.04E+00 | 2.21E-01 |
| | | 969.11 | * | 16.60 | 1.33E+00 | 3.34E-01 |
| AM-243 | 1.00 | 74.67 | * | 66.00 | 2.82E-01 | 6.20E-02 |

* = Energy line found in the spectrum.
\- = Manually added nuclide.
? = Manually edited nuclide.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.30
Errors quoted at 2.000sigma

# INTERFERENCE CORRECTED REPORT

| | Nuclide Name | Nuclide Id Confidence | Wt mean Activity (pCi/grams) | Wt mean Activity Uncertainty | Comments |
|---|---|---|---|---|---|
| | K-40 | 0.960 | 2.38E+01 | 2.52E+00 | |
| ? | CD-109 | 0.986 | 2.86E+00 | 1.05E+00 | |
| ? | SN-126 | 0.995 | 2.48E-01 | 8.94E-02 | |
| | TL-208 | 0.871 | 1.08E+00 | 1.62E-01 | |
| | BI-212 | 0.699 | 9.03E-01 | 5.54E-01 | |
| | PB-212 | 1.000 | 1.23E+00 | 1.40E-01 | |
| | BI-214 | 0.963 | 9.02E-01 | 1.26E-01 | |
| | PB-214 | 0.999 | 1.00E+00 | 1.31E-01 | |
| | RA-224 | 0.911 | 3.59E+00 | 1.19E+00 | |
| | RA-226 | 0.994 | 2.21E+00 | 4.21E+00 | |
| | AC-228 | 0.981 | 1.16E+00 | 1.66E-01 | |
| | AM-243 | 1.000 | 2.82E-01 | 6.20E-02 | |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

? = nuclide is part of an undetermined solution
X = nuclide rejected by the interference analysis
@ = nuclide contains energy lines not used in Weighted Mean Activity

Errors quoted at 2.000sigma

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

# UNIDENTIFIED PEAKS

Peak Locate Performed on : 8/22/2017 2:11:52PM
Peak Locate From Channel : 1
Peak Locate To Channel : 4096

| | Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|---|
| m | 1 | 71.62 | 2.23010E-02 | 50.07 | Tol. | PM-145 |
| m | 3 | 77.09 | 1.87341E-01 | 7.48 | | |
| m | 5 | 92.44 | 6.91052E-02 | 19.34 | | |
| | 6 | 144.38 | 2.42045E-02 | 50.15 | Tol. | U-235 |
| | 8 | 209.78 | 2.49167E-02 | 38.87 | Tol. | CM-243 |
| | 11 | 269.65 | 2.71434E-02 | 34.54 | | |
| | 16 | 463.33 | 1.64188E-02 | 38.13 | Tol. | SB-125 |
| | 17 | 510.60 | 3.54588E-02 | 23.24 | | |
| | 19 | 596.69 | 1.39145E-02 | 44.33 | | |
| M | 20 | 606.13 | 4.18698E-03 | 40.36 | | |
| m | 22 | 613.95 | 7.40453E-03 | 57.63 | Tol. | AG-108M |
| | 24 | 795.72 | 7.72537E-03 | 58.20 | Sum | |
| | 25 | 877.20 | 7.08333E-03 | 44.95 | | |
| M | 26 | 908.45 | 5.48878E-03 | 28.63 | | |
| | 28 | 935.56 | 1.18827E-02 | 61.34 | Sum | |
| | 29 | 951.58 | 6.37975E-03 | 56.93 | | |
| M | 30 | 965.51 | 9.57566E-03 | 42.55 | Sum | |
| | 32 | 1063.55 | 1.13627E-02 | 40.06 | Tol. | BI-207 |
| | 34 | 1237.83 | 9.64669E-03 | 47.32 | | |
| | 35 | 1378.41 | 1.43939E-02 | 24.52 | | |
| | 36 | 1406.24 | 1.25373E-02 | 26.30 | | |
| m | 38 | 1465.69 | 1.14697E-02 | 35.45 | | |
| | 39 | 1554.28 | 1.89394E-03 | 61.79 | | |
| | 40 | 1588.73 | 2.58041E-03 | 63.46 | | |
| | 41 | 1594.61 | 4.19974E-03 | 39.79 | | |
| | 42 | 1660.99 | 3.98746E-03 | 60.88 | | |
| | 43 | 1679.11 | 1.97531E-03 | 48.84 | | |
| | 44 | 1717.83 | 1.66667E-03 | 70.71 | | |
| | 45 | 1728.84 | 4.39153E-03 | 38.02 | | |
| | 47 | 1849.32 | 2.72222E-03 | 56.06 | | |
| | 48 | 1910.42 | 2.75794E-03 | 48.50 | | |
| | 49 | 2023.01 | 2.50000E-03 | 33.33 | | |
| | 50 | 2103.11 | 3.39506E-03 | 44.81 | S-Esc | |
| | 51 | 2109.65 | 2.76515E-03 | 36.57 | | |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| Peak No. | Energy (keV) | Peak Size (CPS) | Peak CPS (%) Uncertainty | Peak Type | Tolerance Nuclide |
|---|---|---|---|---|---|
| 52 | 2177.34 | 1.94444E-03 | 49.62 | | |
| 54 | 2218.27 | 1.89394E-03 | 63.93 | | |
| 55 | 2344.82 | 1.66667E-03 | 40.82 | | |
| 56 | 2378.35 | 3.10458E-03 | 50.71 | | |
| 57 | 2418.22 | 2.77778E-03 | 31.62 | | |
| 58 | 2465.39 | 2.18056E-03 | 49.44 | | |

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

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | BE-7 | 477.59 | | 10.42 | -2.32E-01 | 1.88E+00 | 1.88E+00 |
| + | NA-22 | 1274.54 | | 99.94 | 1.47E-02 | 7.17E-02 | 7.17E-02 |
| + | @ NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 |
| + | AL-26 | 1808.65 | | 99.76 | 7.68E-03 | 4.46E-02 | 4.46E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 2.38E+01 | 6.32E-01 | 6.32E-01 |
| + | @ AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | TI-44 | 67.88 | | 94.40 | 5.51E-03 | 5.69E-02 | 5.69E-02 |
| | | 78.34 | | 96.00 | 1.63E-01 | | 7.18E-02 |
| + | SC-46 | 889.25 | | 99.98 | 1.95E-02 | 1.46E-01 | 1.46E-01 |
| | | 1120.51 | | 99.99 | 3.02E-01 | | 2.39E-01 |
| + | V-48 | 983.52 | | 99.98 | -1.27E+00 | 4.06E+00 | 4.06E+00 |
| | | 1312.10 | | 97.50 | -2.11E+00 | | 4.10E+00 |
| + | CR-51 | 320.08 | | 9.83 | 1.91E-01 | 6.36E+00 | 6.36E+00 |
| + | MN-54 | 834.83 | | 99.97 | 3.06E-03 | 8.15E-02 | 8.15E-02 |
| + | CO-56 | 846.75 | | 99.96 | 1.57E-02 | 1.39E-01 | 1.39E-01 |
| | | 1037.75 | | 14.03 | -5.36E-01 | | 1.06E+00 |
| | | 1238.25 | | 67.00 | 1.57E-01 | | 3.55E-01 |
| | | 1771.40 | | 15.51 | 2.14E-01 | | 7.32E-01 |
| | | 2598.48 | | 16.90 | -2.81E-01 | | 5.05E-01 |
| + | CO-57 | 122.06 | | 85.51 | 7.35E-03 | 6.28E-02 | 6.28E-02 |
| | | 136.48 | | 10.60 | 2.04E-02 | | 5.22E-01 |
| + | CO-58 | 810.76 | | 99.40 | 2.66E-02 | 1.55E-01 | 1.55E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | FE-59 | 1099.22 | | 56.50 | -3.06E-02 | 5.85E-01 | 5.85E-01 |
| | | 1291.56 | | 43.20 | -3.66E-02 | | 7.21E-01 |
| + | CO-60 | 1173.22 | | 100.00 | 2.57E-02 | 6.35E-02 | 8.54E-02 |
| | | 1332.49 | | 100.00 | 2.32E-02 | | 6.35E-02 |
| + | ZN-65 | 1115.52 | | 50.75 | 1.07E-02 | 1.91E-01 | 1.91E-01 |
| + | GA-67 | 93.31 | | 35.70 | 5.97E+08 | 2.43E+08 | 2.43E+08 |
| | | 208.95 | | 2.24 | 2.09E+09 | | 3.30E+09 |
| | | 300.22 | | 16.00 | -1.10E+09 | | 5.26E+08 |
| + | SE-75 | 121.11 | | 16.70 | -1.73E-01 | 1.29E-01 | 4.37E-01 |
| | | 136.00 | | 59.20 | 5.02E-03 | | 1.29E-01 |
| | | 264.65 | | 59.80 | 2.30E-02 | | 1.44E-01 |
| | | 279.53 | | 25.20 | 2.92E-01 | | 3.74E-01 |
| | | 400.65 | | 11.40 | 8.11E-02 | | 8.33E-01 |
| + | RB-82 | 776.52 | | 13.00 | -3.14E-01 | 6.92E+00 | 6.92E+00 |
| + | RB-83 | 520.41 | | 46.00 | -6.45E-02 | 2.40E-01 | 2.40E-01 |
| | | 529.64 | | 30.30 | -2.21E-01 | | 3.63E-01 |
| | | 552.65 | | 16.40 | -2.39E-01 | | 7.15E-01 |
| + | KR-85 | 513.99 | | 0.43 | 1.89E+01 | 1.72E+01 | 1.72E+01 |
| + | SR-85 | 513.99 | | 99.27 | 2.35E-01 | 2.14E-01 | 2.14E-01 |
| + | Y-88 | 898.02 | | 93.40 | -2.99E-02 | 7.44E-02 | 1.23E-01 |
| | | 1836.01 | | 99.38 | 2.94E-02 | | 7.44E-02 |
| + | MO-93 | 263.06 | | 56.72 | 1.25E-02 | 4.70E-02 | 8.55E-02 |
| | | 684.67 | | 99.68 | -6.36E-03 | | 6.05E-02 |
| | | 1477.11 | | 99.08 | -1.50E-02 | | 4.70E-02 |
| + | NB-93M | 16.57 | | 9.43 | -2.41E-01 | 4.21E-01 | 4.21E-01 |
| + | NB-94 | 702.63 | | 100.00 | 2.37E-02 | 5.76E-02 | 6.14E-02 |
| | | 871.10 | | 100.00 | 6.52E-03 | | 5.76E-02 |
| + | NB-95 | 765.79 | | 99.81 | 3.15E-01 | 4.70E-01 | 4.70E-01 |
| + | NB-95M | 235.69 | | 25.00 | -3.11E+08 | 4.50E+07 | 4.50E+07 |
| + | ZR-95 | 724.18 | | 43.70 | 7.05E-03 | 3.29E-01 | 4.87E-01 |
| | | 756.72 | | 55.30 | 2.12E-01 | | 3.29E-01 |
| + | MO-99 | 181.06 | | 6.20 | -5.61E+09 | 3.23E+10 | 5.42E+10 |
| | | 739.58 | | 12.80 | 1.34E+09 | | 3.23E+10 |
| | | 778.00 | | 4.50 | -3.10E+09 | | 9.79E+10 |
| + | RU-103 | 497.08 | | 89.00 | 3.31E-02 | 3.49E-01 | 3.49E-01 |
| + | RU-106 | 621.84 | | 9.80 | 9.83E-02 | 6.88E-01 | 6.88E-01 |
| + | AG-108M | 433.93 | | 89.90 | -2.02E-02 | 5.63E-02 | 5.63E-02 |
| | | 614.37 | | 90.40 | -4.21E-01 | | 7.44E-02 |
| | | 722.95 | | 90.50 | -1.07E-01 | | 7.15E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 2.86E+00 | 3.54E+00 | 3.54E+00 |
| + | AG-110M | 657.75 | | 93.14 | -3.56E-02 | 7.35E-02 | 7.35E-02 |
| | | 677.61 | | 10.53 | 1.43E-02 | | 6.89E-01 |
| | | 706.67 | | 16.46 | -1.43E-01 | | 4.53E-01 |
| | | 763.93 | | 21.98 | -2.89E-01 | | 3.38E-01 |
| | | 884.67 | | 71.63 | -2.91E-03 | | 1.06E-01 |
| | | 1384.27 | | 23.94 | 2.46E-02 | | 2.85E-01 |
| + | CD-113M | 263.70 | | 0.02 | 2.14E-01 | 2.06E+02 | 2.06E+02 |
| + | SN-113 | 255.12 | | 1.93 | -8.71E-01 | 1.41E-01 | 3.88E+00 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | SN-113 | 391.69 | | 64.90 | -2.79E-02 | 1.41E-01 | 1.41E-01 |
| + | TE123M | 159.00 | | 84.10 | 3.39E-02 | 9.18E-02 | 9.18E-02 |
| + | SB-124 | 602.71 | | 97.87 | 7.25E-03 | 1.63E-01 | 1.63E-01 |
| | | 645.85 | | 7.26 | -1.18E+00 | | 2.21E+00 |
| | | 722.78 | | 11.10 | -2.73E+00 | | 1.83E+00 |
| | | 1691.02 | | 49.00 | -8.38E-02 | | 1.87E-01 |
| + | I-125 | 35.49 | | 6.49 | 3.55E-01 | 2.35E+00 | 2.35E+00 |
| + | SB-125 | 176.33 | | 6.89 | 3.78E-02 | 1.84E-01 | 6.83E-01 |
| | | 427.89 | | 29.33 | 5.56E-02 | | 1.84E-01 |
| | | 463.38 | | 10.35 | 5.28E-01 | | 6.29E-01 |
| | | 600.56 | | 17.80 | 1.36E-02 | | 3.24E-01 |
| | | 635.90 | | 11.32 | 1.98E-01 | | 5.27E-01 |
| + | SB-126 | 414.70 | | 83.30 | -1.21E+01 | 1.46E+01 | 1.54E+01 |
| | | 666.33 | | 99.60 | 3.34E+00 | | 1.56E+01 |
| | | 695.00 | | 99.60 | -1.96E+00 | | 1.46E+01 |
| | | 720.50 | | 53.80 | 4.35E+00 | | 2.97E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 2.48E-01 | 3.07E-01 | 3.07E-01 |
| + | SB-127 | 473.00 | | 25.00 | -1.79E+06 | 9.71E+06 | 1.15E+07 |
| | | 685.20 | | 35.70 | -1.02E+06 | | 9.71E+06 |
| | | 783.80 | | 14.70 | 9.27E+06 | | 2.50E+07 |
| + | I-129 | 29.78 | | 57.00 | -5.42E-02 | 9.09E-02 | 9.09E-02 |
| | | 33.60 | | 13.20 | 1.75E-01 | | 3.83E-01 |
| | | 39.58 | | 7.52 | 1.41E-01 | | 6.06E-01 |
| + | I-131 | 284.30 | | 6.05 | -5.06E+02 | 3.18E+02 | 4.19E+03 |
| | | 364.48 | | 81.20 | 2.46E+01 | | 3.18E+02 |
| | | 636.97 | | 7.26 | 1.24E+02 | | 3.94E+03 |
| | | 722.89 | | 1.80 | -2.81E+04 | | 1.88E+04 |
| + | TE-132 | 49.72 | | 13.10 | -4.73E+08 | 7.70E+07 | 5.40E+08 |
| | | 228.16 | | 88.00 | -9.99E+05 | | 7.70E+07 |
| + | BA-133 | 81.00 | | 33.00 | -5.27E-01 | 1.22E-01 | 1.52E-01 |
| | | 302.84 | | 17.80 | 8.58E-03 | | 3.21E-01 |
| | | 356.01 | | 60.00 | 6.55E-03 | | 1.22E-01 |
| + | @ I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| + | XE-133 | 81.00 | | 38.00 | -2.27E+05 | 6.54E+04 | 6.54E+04 |
| + | CS-134 | 563.23 | | 8.38 | 5.06E-01 | 6.63E-02 | 6.97E-01 |
| | | 569.32 | | 15.43 | -2.21E-01 | | 3.22E-01 |
| | | 604.70 | | 97.60 | 2.54E-03 | | 6.63E-02 |
| | | 795.84 | | 85.40 | 3.77E-02 | | 8.83E-02 |
| | | 801.93 | | 8.73 | 4.24E-01 | | 8.27E-01 |
| + | CS-135 | 268.24 | | 16.00 | 4.09E-01 | 3.52E-01 | 3.52E-01 |
| + | @ I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 |
| | @ | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 |
| + | CS-136 | 153.22 | | 7.46 | -1.40E+01 | 1.03E+01 | 1.09E+02 |
| | | 163.89 | | 4.61 | -1.06E+01 | | 1.74E+02 |
| | | 176.55 | | 13.56 | 3.36E+00 | | 6.07E+01 |
| | | 273.65 | | 12.66 | -6.91E+00 | | 8.02E+01 |
| | | 340.57 | | 48.50 | -5.69E-01 | | 2.58E+01 |
| | | 818.50 | | 99.70 | -3.14E-01 | | 1.03E+01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|
| | CS-136 | 1048.07 | 79.60 | 4.71E+00 | 1.03E+01 | 1.59E+01 |
| | | 1235.34 | 19.70 | 5.01E+00 | | 9.29E+01 |
| + | CS-137 | 661.65 | 85.12 | -6.10E-03 | 6.62E-02 | 6.62E-02 |
| + | LA-138 | 788.74 | 34.00 | 1.07E-01 | 7.18E-02 | 1.81E-01 |
| | | 1435.80 | 66.00 | -1.87E-02 | | 7.18E-02 |
| + | CE-139 | 165.85 | 80.35 | 1.81E-02 | 8.90E-02 | 8.90E-02 |
| + | BA-140 | 162.64 | 6.70 | -5.47E+01 | 4.58E+01 | 1.37E+02 |
| | | 304.84 | 4.50 | 9.66E+00 | | 2.39E+02 |
| | | 423.70 | 3.20 | -2.52E+02 | | 3.24E+02 |
| | | 437.55 | 2.00 | 2.47E+02 | | 5.88E+02 |
| | | 537.32 | 25.00 | 3.39E+00 | | 4.58E+01 |
| + | LA-140 | 328.77 | 20.50 | -3.37E+00 | 1.10E+01 | 5.71E+01 |
| | | 487.03 | 45.50 | -1.34E+01 | | 2.43E+01 |
| | | 815.85 | 23.50 | 5.18E+00 | | 5.27E+01 |
| | | 1596.49 | 95.49 | -3.20E-01 | | 1.10E+01 |
| + | CE-141 | 145.44 | 48.40 | -1.07E-01 | 7.48E-01 | 7.48E-01 |
| + | @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 |
| | @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 |
| | @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 |
| + | CE-144 | 133.54 | 10.80 | -1.86E-01 | 5.07E-01 | 5.07E-01 |
| + | PM-144 | 476.78 | 42.00 | 4.31E-02 | 6.72E-02 | 1.54E-01 |
| | | 618.01 | 98.60 | 1.06E-02 | | 7.18E-02 |
| | | 696.49 | 99.49 | -4.93E-02 | | 6.72E-02 |
| + | PM-145 | 36.85 | 21.70 | -1.74E-01 | 1.19E-01 | 2.15E-01 |
| | | 37.36 | 39.70 | 3.32E-02 | | 1.19E-01 |
| | | 42.30 | 15.10 | -3.27E-01 | | 2.90E-01 |
| | | 72.40 | 2.31 | -2.18E+00 | | 2.68E+00 |
| + | PM-146 | 453.90 | 39.94 | -3.43E-02 | 1.34E-01 | 1.34E-01 |
| | | 735.90 | 14.01 | -8.08E-02 | | 3.86E-01 |
| | | 747.13 | 13.10 | 3.31E-02 | | 4.55E-01 |
| + | ND-147 | 91.11 | 28.90 | 1.92E+02 | 1.12E+02 | 1.12E+02 |
| | | 531.02 | 13.10 | -1.12E+02 | | 1.98E+02 |
| + | PM-149 | 285.90 | 3.10 | 2.96E+13 | 5.32E+13 | 5.32E+13 |
| + | EU-152 | 121.78 | 20.50 | -8.07E-02 | 2.03E-01 | 2.03E-01 |
| | | 244.69 | 5.40 | -9.82E-01 | | 8.61E-01 |
| | | 344.27 | 19.13 | -6.52E-02 | | 2.61E-01 |
| | | 778.89 | 9.20 | -4.78E-02 | | 6.35E-01 |
| | | 964.01 | 10.40 | -2.03E+00 | | 7.76E-01 |
| | | 1085.78 | 7.22 | 4.06E-01 | | 9.83E-01 |
| | | 1112.02 | 9.60 | -1.77E-01 | | 7.12E-01 |
| | | 1407.95 | 14.94 | 1.15E-01 | | 4.60E-01 |
| + | GD-153 | 97.43 | 31.30 | 6.49E-02 | 1.85E-01 | 1.85E-01 |
| | | 103.18 | 22.20 | -1.37E-01 | | 2.58E-01 |
| + | EU-154 | 123.07 | 40.50 | 3.45E-02 | 1.07E-01 | 1.07E-01 |
| | | 723.30 | 19.70 | -5.01E-01 | | 3.35E-01 |
| | | 873.19 | 11.50 | -2.17E-02 | | 5.08E-01 |
| | | 996.32 | 10.30 | -3.82E-01 | | 6.37E-01 |
| | | 1004.76 | 17.90 | 1.38E-01 | | 4.04E-01 |
| | | 1274.45 | 35.50 | 3.92E-02 | | 1.92E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| + | EU-155 | 86.50 | | 30.90 | 5.11E-02 | 1.84E-01 | 1.84E-01 |
| | | 105.30 | | 20.70 | 1.19E-01 | | 2.23E-01 |
| + | EU-156 | 811.77 | | 10.40 | -5.89E+00 | 5.07E+01 | 5.07E+01 |
| | | 1153.47 | | 7.20 | -2.40E+00 | | 9.52E+01 |
| | | 1230.71 | | 8.90 | 1.82E+01 | | 9.02E+01 |
| + | HO-166M | 184.41 | | 72.60 | 1.41E-01 | 7.66E-02 | 7.66E-02 |
| | | 280.45 | | 29.60 | 8.30E-02 | | 1.75E-01 |
| | | 410.94 | | 11.10 | 3.34E-01 | | 4.93E-01 |
| | | 711.69 | | 54.10 | -3.83E-02 | | 1.08E-01 |
| + | TM-171 | 66.72 | | 0.14 | -3.50E+01 | 4.29E+01 | 4.29E+01 |
| + | HF-172 | 67.35 | | 5.31 | 1.08E-01 | 4.10E-01 | 1.12E+00 |
| | | 125.81 | | 11.30 | -4.81E-01 | | 4.10E-01 |
| + | LU-172 | 181.53 | | 20.60 | -6.62E+02 | 3.34E+03 | 6.39E+03 |
| | | 900.72 | | 29.81 | -2.15E+03 | | 5.79E+03 |
| | | 1093.66 | | 62.50 | 9.10E+02 | | 3.34E+03 |
| + | LU-173 | 100.72 | | 5.24 | 3.02E-01 | 3.04E-01 | 9.58E-01 |
| | | 272.11 | | 21.20 | -2.96E-02 | | 3.04E-01 |
| + | HF-175 | 343.40 | | 84.00 | -3.91E-02 | 1.54E-01 | 1.54E-01 |
| + | LU-176 | 88.34 | | 13.30 | -1.95E-01 | 5.15E-02 | 4.29E-01 |
| | | 201.83 | | 86.00 | -1.93E-02 | | 5.22E-02 |
| | | 306.78 | | 94.00 | -4.72E-03 | | 5.15E-02 |
| + | HF-181 | 133.02 | | 41.70 | -1.91E-01 | 3.46E-01 | 5.23E-01 |
| | | 345.85 | | 17.20 | -3.64E-01 | | 1.46E+00 |
| | | 482.03 | | 82.80 | 5.53E-02 | | 3.46E-01 |
| + | TA-182 | 67.75 | | 41.20 | 2.30E-02 | 2.37E-01 | 2.37E-01 |
| | | 1121.30 | | 34.90 | 8.30E-01 | | 5.57E-01 |
| | | 1189.05 | | 16.23 | 3.36E-02 | | 9.13E-01 |
| | | 1221.41 | | 26.98 | -6.79E-02 | | 5.64E-01 |
| | | 1231.02 | | 11.44 | 2.77E-01 | | 1.38E+00 |
| + | IR-192 | 308.46 | | 29.68 | 1.13E-01 | 2.59E-01 | 4.08E-01 |
| | | 468.07 | | 48.10 | 3.16E-02 | | 2.59E-01 |
| + | HG-203 | 279.19 | | 77.30 | 2.34E-01 | 3.00E-01 | 3.00E-01 |
| + | TL-204 | 374.74 | | 94.11 | 8.17E-03 | 5.65E-02 | 5.65E-02 |
| | | 899.15 | | 99.16 | -1.75E-02 | | 6.40E-02 |
| | | 911.74 | | 91.10 | 3.49E-01 | | 1.38E-01 |
| + | BI-207 | 569.67 | | 97.72 | -1.29E-02 | 4.97E-02 | 4.97E-02 |
| | | 1063.62 | | 74.90 | 9.86E-02 | | 1.08E-01 |
| + | TL-208 | 583.14 | * | 30.22 | 1.17E+00 | 1.00E-01 | 2.62E-01 |
| | | 860.37 | | 4.48 | 9.49E-01 | | 1.55E+00 |
| | | 2614.66 | * | 35.85 | 1.00E+00 | | 1.00E-01 |
| + | BI-210M | 262.00 | | 45.00 | 3.44E-02 | 1.06E-01 | 1.06E-01 |
| | | 300.00 | | 23.00 | -7.26E-01 | | 2.60E-01 |
| + | PB-210 | 46.50 | | 4.25 | 1.29E+00 | 1.17E+00 | 1.17E+00 |
| + | PB-211 | 404.84 | | 2.90 | -1.69E+00 | 1.81E+00 | 1.81E+00 |
| | | 831.96 | | 2.90 | -1.15E-01 | | 2.09E+00 |
| + | BI-212 | 727.17 | * | 11.80 | 9.03E-01 | 8.66E-01 | 8.66E-01 |
| | | 1620.62 | | 2.75 | 1.29E-01 | | 1.62E+00 |
| + | PB-212 | 238.63 | * | 44.60 | 1.22E+00 | 2.20E-01 | 2.20E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Activity (pCi/grams) | Nuclide MDA (pCi/grams) | Line MDA (pCi/grams) |
|---|---|---|---|---|---|---|---|
| | PB-212 | 300.09 | * | 3.41 | 1.89E+00 | 2.20E-01 | 2.55E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 8.68E-01 | 2.14E-01 | 2.14E-01 |
| | | 1120.29 | * | 15.10 | 1.08E+00 | | 8.15E-01 |
| | | 1764.49 | * | 15.80 | 9.20E-01 | | 4.14E-01 |
| | | 2204.22 | * | 4.98 | 1.72E+00 | | 1.31E+00 |
| + | PB-214 | 295.21 | * | 19.19 | 1.09E+00 | 2.11E-01 | 4.39E-01 |
| | | 351.92 | * | 37.19 | 9.35E-01 | | 2.11E-01 |
| + | RN-219 | 401.80 | | 6.50 | 1.26E-01 | 8.26E-01 | 8.26E-01 |
| + | RA-223 | 323.87 | | 3.88 | -8.24E-01 | 1.34E+00 | 1.34E+00 |
| + | RA-224 | 240.98 | * | 3.95 | 3.59E+00 | 2.47E+00 | 2.47E+00 |
| + | RA-225 | 40.00 | | 31.00 | 1.64E-01 | 1.52E+01 | 1.52E+01 |
| + | RA-226 | 186.21 | * | 3.28 | 2.21E+00 | 1.91E+00 | 1.91E+00 |
| + | TH-227 | 50.10 | | 8.40 | -4.26E-01 | 5.11E-01 | 5.50E-01 |
| | | 236.00 | | 11.50 | -3.53E+00 | | 5.11E-01 |
| | | 256.20 | | 6.30 | -5.06E-02 | | 7.73E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 1.29E+00 | 2.94E-01 | 5.35E-01 |
| | | 911.07 | * | 27.70 | 1.04E+00 | | 2.94E-01 |
| | | 969.11 | * | 16.60 | 1.33E+00 | | 9.01E-01 |
| + | TH-230 | 48.44 | | 16.90 | 1.08E-01 | 2.93E-01 | 2.93E-01 |
| | | 62.85 | | 4.60 | 1.86E-01 | | 1.19E+00 |
| | | 67.67 | | 0.37 | 1.40E+00 | | 1.45E+01 |
| + | PA-231 | 283.67 | | 1.60 | -2.59E+00 | 2.44E+00 | 2.97E+00 |
| | | 302.67 | | 2.30 | 6.52E-02 | | 2.44E+00 |
| + | TH-231 | 25.64 | | 14.70 | -2.29E+00 | 4.67E-01 | 4.67E-01 |
| | | 84.21 | | 6.40 | -8.13E-01 | | 7.95E-01 |
| + | PA-233 | 311.98 | | 38.60 | -8.16E-01 | 1.53E+00 | 1.53E+00 |
| + | PA-234 | 131.20 | | 20.40 | 7.90E-02 | 2.21E-01 | 2.21E-01 |
| | | 733.99 | | 8.80 | 1.15E-01 | | 6.22E-01 |
| | | 946.00 | | 12.00 | -4.08E-01 | | 5.02E-01 |
| + | PA-234M | 1001.03 | | 0.92 | -1.76E+00 | 7.67E+00 | 7.67E+00 |
| + | TH-234 | 63.29 | | 3.80 | 1.49E+00 | 1.49E+00 | 1.49E+00 |
| + | U-235 | 143.76 | | 10.50 | 3.65E-01 | 4.26E-01 | 4.26E-01 |
| | | 163.35 | | 4.70 | -5.55E-02 | | 9.13E-01 |
| | | 205.31 | | 4.70 | 4.14E-01 | | 9.98E-01 |
| + | NP-237 | 86.50 | | 12.60 | 1.21E-01 | 4.35E-01 | 4.35E-01 |
| + | NP-239 | 106.10 | | 22.70 | 1.63E+11 | 9.63E+11 | 9.63E+11 |
| | | 228.18 | | 10.70 | -2.72E+10 | | 2.10E+12 |
| | | 277.60 | | 14.10 | 1.08E+12 | | 1.88E+12 |
| + | AM-241 | 59.54 | | 35.90 | 4.01E-02 | 1.35E-01 | 1.35E-01 |
| + | AM-243 | 74.67 | * | 66.00 | 2.82E-01 | 2.54E-01 | 2.54E-01 |
| + | CM-243 | 209.75 | | 3.29 | 1.63E+00 | 3.84E-01 | 1.55E+00 |
| | | 228.14 | | 10.60 | -5.56E-03 | | 4.28E-01 |
| | | 277.60 | | 14.00 | 2.20E-01 | | 3.84E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = MDA value not calculated
@ = Half-life too short to be able to perform the decay correction
? = CAUTION: MDA value is inconsistent with Currie MDA at 95% confidence level

# NUCLIDE MDA REPORT

Nuclide Library Used : \\OR-GAMMA1\ApexRoot\Countroom\Library\TMA2.NLB

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | BE-7 | 477.59 | | 10.42 | 1.88E+00 | 1.88E+00 | -2.32E-01 | 8.97E-01 |
| | NA-22 | 1274.54 | | 99.94 | 7.17E-02 | 7.17E-02 | 1.47E-02 | 3.30E-02 |
| @ | NA-24 | 1368.53 | | 99.99 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 2754.09 | | 99.86 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | AL-26 | 1808.65 | | 99.76 | 4.46E-02 | 4.46E-02 | 7.68E-03 | 1.88E-02 |
| + | K-40 | 1460.81 | * | 10.67 | 6.32E-01 | 6.32E-01 | 2.38E+01 | 2.88E-01 |
| @ | AR-41 | 1293.64 | | 99.16 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | TI-44 | 67.88 | | 94.40 | 5.69E-02 | 5.69E-02 | 5.51E-03 | 2.79E-02 |
| | | 78.34 | | 96.00 | 7.18E-02 | | 1.63E-01 | 3.53E-02 |
| | SC-46 | 889.25 | | 99.98 | 1.46E-01 | 1.46E-01 | 1.95E-02 | 6.83E-02 |
| | | 1120.51 | | 99.99 | 2.39E-01 | | 3.02E-01 | 1.14E-01 |
| | V-48 | 983.52 | | 99.98 | 4.06E+00 | 4.06E+00 | -1.27E+00 | 1.87E+00 |
| | | 1312.10 | | 97.50 | 4.10E+00 | | -2.11E+00 | 1.84E+00 |
| | CR-51 | 320.08 | | 9.83 | 6.36E+00 | 6.36E+00 | 1.91E-01 | 3.06E+00 |
| | MN-54 | 834.83 | | 99.97 | 8.15E-02 | 8.15E-02 | 3.06E-03 | 3.83E-02 |
| | CO-56 | 846.75 | | 99.96 | 1.39E-01 | 1.39E-01 | 1.57E-02 | 6.49E-02 |
| | | 1037.75 | | 14.03 | 1.06E+00 | | -5.36E-01 | 4.89E-01 |
| | | 1238.25 | | 67.00 | 3.55E-01 | | 1.57E-01 | 1.68E-01 |
| | | 1771.40 | | 15.51 | 7.32E-01 | | 2.14E-01 | 3.13E-01 |
| | | 2598.48 | | 16.90 | 5.05E-01 | | -2.81E-01 | 1.89E-01 |
| | CO-57 | 122.06 | | 85.51 | 6.28E-02 | 6.28E-02 | 7.35E-03 | 3.05E-02 |
| | | 136.48 | | 10.60 | 5.22E-01 | | 2.04E-02 | 2.54E-01 |
| | CO-58 | 810.76 | | 99.40 | 1.55E-01 | 1.55E-01 | 2.66E-02 | 7.24E-02 |
| | FE-59 | 1099.22 | | 56.50 | 5.85E-01 | 5.85E-01 | -3.06E-02 | 2.72E-01 |
| | | 1291.56 | | 43.20 | 7.21E-01 | | -3.66E-02 | 3.31E-01 |
| | CO-60 | 1173.22 | | 100.00 | 8.54E-02 | 6.35E-02 | 2.57E-02 | 4.01E-02 |
| | | 1332.49 | | 100.00 | 6.35E-02 | | 2.32E-02 | 2.88E-02 |
| | ZN-65 | 1115.52 | | 50.75 | 1.91E-01 | 1.91E-01 | 1.07E-02 | 8.89E-02 |
| | GA-67 | 93.31 | | 35.70 | 2.43E+08 | 2.43E+08 | 5.97E+08 | 1.19E+08 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | GA-67 | 208.95 | | 2.24 | 3.30E+09 | 2.43E+08 | 2.09E+09 | 1.60E+09 |
| | | 300.22 | | 16.00 | 5.26E+08 | | -1.10E+09 | 2.55E+08 |
| | SE-75 | 121.11 | | 16.70 | 4.37E-01 | 1.29E-01 | -1.73E-01 | 2.12E-01 |
| | | 136.00 | | 59.20 | 1.29E-01 | | 5.02E-03 | 6.26E-02 |
| | | 264.65 | | 59.80 | 1.44E-01 | | 2.30E-02 | 6.94E-02 |
| | | 279.53 | | 25.20 | 3.74E-01 | | 2.92E-01 | 1.81E-01 |
| | | 400.65 | | 11.40 | 8.33E-01 | | 8.11E-02 | 3.99E-01 |
| | RB-82 | 776.52 | | 13.00 | 6.92E+00 | 6.92E+00 | -3.14E-01 | 3.25E+00 |
| | RB-83 | 520.41 | | 46.00 | 2.40E-01 | 2.40E-01 | -6.45E-02 | 1.14E-01 |
| | | 529.64 | | 30.30 | 3.63E-01 | | -2.21E-01 | 1.71E-01 |
| | | 552.65 | | 16.40 | 7.15E-01 | | -2.39E-01 | 3.38E-01 |
| | KR-85 | 513.99 | | 0.43 | 1.72E+01 | 1.72E+01 | 1.89E+01 | 8.29E+00 |
| | SR-85 | 513.99 | | 99.27 | 2.14E-01 | 2.14E-01 | 2.35E-01 | 1.03E-01 |
| | Y-88 | 898.02 | | 93.40 | 1.23E-01 | 7.44E-02 | -2.99E-02 | 5.73E-02 |
| | | 1836.01 | | 99.38 | 7.44E-02 | | 2.94E-02 | 3.05E-02 |
| | MO-93 | 263.06 | | 56.72 | 8.55E-02 | 4.70E-02 | 1.25E-02 | 4.12E-02 |
| | | 684.67 | | 99.68 | 6.05E-02 | | -6.36E-03 | 2.85E-02 |
| | | 1477.11 | | 99.08 | 4.70E-02 | | -1.50E-02 | 2.04E-02 |
| | NB-93M | 16.57 | | 9.43 | 4.21E-01 | 4.21E-01 | -2.41E-01 | 1.96E-01 |
| | NB-94 | 702.63 | | 100.00 | 6.14E-02 | 5.76E-02 | 2.37E-02 | 2.90E-02 |
| | | 871.10 | | 100.00 | 5.76E-02 | | 6.52E-03 | 2.68E-02 |
| | NB-95 | 765.79 | | 99.81 | 4.70E-01 | 4.70E-01 | 3.15E-01 | 2.22E-01 |
| | NB-95M | 235.69 | | 25.00 | 4.50E+07 | 4.50E+07 | -3.11E+08 | 2.19E+07 |
| | ZR-95 | 724.18 | | 43.70 | 4.87E-01 | 3.29E-01 | 7.05E-03 | 2.31E-01 |
| | | 756.72 | | 55.30 | 3.29E-01 | | 2.12E-01 | 1.55E-01 |
| | MO-99 | 181.06 | | 6.20 | 5.42E+10 | 3.23E+10 | -5.61E+09 | 2.63E+10 |
| | | 739.58 | | 12.80 | 3.23E+10 | | 1.34E+09 | 1.51E+10 |
| | | 778.00 | | 4.50 | 9.79E+10 | | -3.10E+09 | 4.59E+10 |
| | RU-103 | 497.08 | | 89.00 | 3.49E-01 | 3.49E-01 | 3.31E-02 | 1.66E-01 |
| | RU-106 | 621.84 | | 9.80 | 6.88E-01 | 6.88E-01 | 9.83E-02 | 3.25E-01 |
| | AG-108M | 433.93 | | 89.90 | 5.63E-02 | 5.63E-02 | -2.02E-02 | 2.68E-02 |
| | | 614.37 | | 90.40 | 7.44E-02 | | -4.21E-01 | 3.55E-02 |
| | | 722.95 | | 90.50 | 7.15E-02 | | -1.07E-01 | 3.38E-02 |
| + | CD-109 | 88.03 | * | 3.72 | 3.54E+00 | 3.54E+00 | 2.86E+00 | 1.75E+00 |
| | AG-110M | 657.75 | | 93.14 | 7.35E-02 | 7.35E-02 | -3.56E-02 | 3.44E-02 |
| | | 677.61 | | 10.53 | 6.89E-01 | | 1.43E-02 | 3.24E-01 |
| | | 706.67 | | 16.46 | 4.53E-01 | | -1.43E-01 | 2.13E-01 |
| | | 763.93 | | 21.98 | 3.38E-01 | | -2.89E-01 | 1.58E-01 |
| | | 884.67 | | 71.63 | 1.06E-01 | | -2.91E-03 | 4.94E-02 |
| | | 1384.27 | | 23.94 | 2.85E-01 | | 2.46E-02 | 1.27E-01 |
| | CD-113M | 263.70 | | 0.02 | 2.06E+02 | 2.06E+02 | 2.14E-01 | 9.94E+01 |
| | SN-113 | 255.12 | | 1.93 | 3.88E+00 | 1.41E-01 | -8.71E-01 | 1.86E+00 |
| | | 391.69 | | 64.90 | 1.41E-01 | | -2.79E-02 | 6.75E-02 |
| | TE123M | 159.00 | | 84.10 | 9.18E-02 | 9.18E-02 | 3.39E-02 | 4.45E-02 |
| | SB-124 | 602.71 | | 97.87 | 1.63E-01 | 1.63E-01 | 7.25E-03 | 7.68E-02 |
| | | 645.85 | | 7.26 | 2.21E+00 | | -1.18E+00 | 1.04E+00 |
| | | 722.78 | | 11.10 | 1.83E+00 | | -2.73E+00 | 8.63E-01 |
| | | 1691.02 | | 49.00 | 1.87E-01 | | -8.38E-02 | 7.25E-02 |
| | I-125 | 35.49 | | 6.49 | 2.35E+00 | 2.35E+00 | 3.55E-01 | 1.14E+00 |
| | SB-125 | 176.33 | | 6.89 | 6.83E-01 | 1.84E-01 | 3.78E-02 | 3.31E-01 |
| | | 427.89 | | 29.33 | 1.84E-01 | | 5.56E-02 | 8.75E-02 |
| | | 463.38 | | 10.35 | 6.29E-01 | | 5.28E-01 | 3.02E-01 |
| | | 600.56 | | 17.80 | 3.24E-01 | | 1.36E-02 | 1.53E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | SB-125 | 635.90 | | 11.32 | 5.27E-01 | 1.84E-01 | 1.98E-01 | 2.48E-01 |
| | SB-126 | 414.70 | | 83.30 | 1.54E+01 | 1.46E+01 | -1.21E+01 | 7.33E+00 |
| | | 666.33 | | 99.60 | 1.56E+01 | | 3.34E+00 | 7.35E+00 |
| | | 695.00 | | 99.60 | 1.46E+01 | | -1.96E+00 | 6.87E+00 |
| | | 720.50 | | 53.80 | 2.97E+01 | | 4.35E+00 | 1.40E+01 |
| + | SN-126 | 87.57 | * | 37.00 | 3.07E-01 | 3.07E-01 | 2.48E-01 | 1.52E-01 |
| | SB-127 | 473.00 | | 25.00 | 1.15E+07 | 9.71E+06 | -1.79E+06 | 5.47E+06 |
| | | 685.20 | | 35.70 | 9.71E+06 | | -1.02E+06 | 4.58E+06 |
| | | 783.80 | | 14.70 | 2.50E+07 | | 9.27E+06 | 1.18E+07 |
| | I-129 | 29.78 | | 57.00 | 9.09E-02 | 9.09E-02 | -5.42E-02 | 4.41E-02 |
| | | 33.60 | | 13.20 | 3.83E-01 | | 1.75E-01 | 1.86E-01 |
| | | 39.58 | | 7.52 | 6.06E-01 | | 1.41E-01 | 2.95E-01 |
| | I-131 | 284.30 | | 6.05 | 4.19E+03 | 3.18E+02 | -5.06E+02 | 2.02E+03 |
| | | 364.48 | | 81.20 | 3.18E+02 | | 2.46E+01 | 1.52E+02 |
| | | 636.97 | | 7.26 | 3.94E+03 | | 1.24E+02 | 1.86E+03 |
| | | 722.89 | | 1.80 | 1.88E+04 | | -2.81E+04 | 8.88E+03 |
| | TE-132 | 49.72 | | 13.10 | 5.40E+08 | 7.70E+07 | -4.73E+08 | 2.63E+08 |
| | | 228.16 | | 88.00 | 7.70E+07 | | -9.99E+05 | 3.72E+07 |
| | BA-133 | 81.00 | | 33.00 | 1.52E-01 | 1.22E-01 | -5.27E-01 | 7.43E-02 |
| | | 302.84 | | 17.80 | 3.21E-01 | | 8.58E-03 | 1.55E-01 |
| | | 356.01 | | 60.00 | 1.22E-01 | | 6.55E-03 | 5.95E-02 |
| @ | I-133 | 529.87 | | 86.30 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| | XE-133 | 81.00 | | 38.00 | 6.54E+04 | 6.54E+04 | -2.27E+05 | 3.20E+04 |
| | CS-134 | 563.23 | | 8.38 | 6.97E-01 | 6.63E-02 | 5.06E-01 | 3.30E-01 |
| | | 569.32 | | 15.43 | 3.22E-01 | | -2.21E-01 | 1.51E-01 |
| | | 604.70 | | 97.60 | 6.63E-02 | | 2.54E-03 | 3.15E-02 |
| | | 795.84 | | 85.40 | 8.83E-02 | | 3.77E-02 | 4.17E-02 |
| | | 801.93 | | 8.73 | 8.27E-01 | | 4.24E-01 | 3.90E-01 |
| | CS-135 | 268.24 | | 16.00 | 3.52E-01 | 3.52E-01 | 4.09E-01 | 1.71E-01 |
| @ | I-135 | 1131.51 | | 22.50 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | | 1260.41 | | 28.60 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | | 1678.03 | | 9.54 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| | CS-136 | 153.22 | | 7.46 | 1.09E+02 | 1.03E+01 | -1.40E+01 | 5.27E+01 |
| | | 163.89 | | 4.61 | 1.74E+02 | | -1.06E+01 | 8.46E+01 |
| | | 176.55 | | 13.56 | 6.07E+01 | | 3.36E+00 | 2.95E+01 |
| | | 273.65 | | 12.66 | 8.02E+01 | | -6.91E+00 | 3.88E+01 |
| | | 340.57 | | 48.50 | 2.58E+01 | | -5.69E-01 | 1.25E+01 |
| | | 818.50 | | 99.70 | 1.03E+01 | | -3.14E-01 | 4.79E+00 |
| | | 1048.07 | | 79.60 | 1.59E+01 | | 4.71E+00 | 7.41E+00 |
| | | 1235.34 | | 19.70 | 9.29E+01 | | 5.01E+00 | 4.40E+01 |
| | CS-137 | 661.65 | | 85.12 | 6.62E-02 | 6.62E-02 | -6.10E-03 | 3.11E-02 |
| | LA-138 | 788.74 | | 34.00 | 1.81E-01 | 7.18E-02 | 1.07E-01 | 8.50E-02 |
| | | 1435.80 | | 66.00 | 7.18E-02 | | -1.87E-02 | 3.15E-02 |
| | CE-139 | 165.85 | | 80.35 | 8.90E-02 | 8.90E-02 | 1.81E-02 | 4.32E-02 |
| | BA-140 | 162.64 | | 6.70 | 1.37E+02 | 4.58E+01 | -5.47E+01 | 6.64E+01 |
| | | 304.84 | | 4.50 | 2.39E+02 | | 9.66E+00 | 1.15E+02 |
| | | 423.70 | | 3.20 | 3.24E+02 | | -2.52E+02 | 1.54E+02 |
| | | 437.55 | | 2.00 | 5.88E+02 | | 2.47E+02 | 2.81E+02 |
| | | 537.32 | | 25.00 | 4.58E+01 | | 3.39E+00 | 2.17E+01 |
| | LA-140 | 328.77 | | 20.50 | 5.71E+01 | 1.10E+01 | -3.37E+00 | 2.75E+01 |
| | | 487.03 | | 45.50 | 2.43E+01 | | -1.34E+01 | 1.15E+01 |
| | | 815.85 | | 23.50 | 5.27E+01 | | 5.18E+00 | 2.46E+01 |
| | | 1596.49 | | 95.49 | 1.10E+01 | | -3.20E-01 | 4.80E+00 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| Nuclide Name | Energy (keV) | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|
| CE-141 | 145.44 | 48.40 | 7.48E-01 | 7.48E-01 | -1.07E-01 | 3.64E-01 |
| @ CE-143 | 57.36 | 11.80 | 1.00E+26 | 1.00E+26 | 1.00E+26 | 1.00E+20 |
| @ | 293.26 | 42.00 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| @ | 664.55 | 5.20 | 1.00E+26 | | 1.00E+26 | 1.00E+20 |
| CE-144 | 133.54 | 10.80 | 5.07E-01 | 5.07E-01 | -1.86E-01 | 2.47E-01 |
| PM-144 | 476.78 | 42.00 | 1.54E-01 | 6.72E-02 | 4.31E-02 | 7.35E-02 |
| | 618.01 | 98.60 | 7.18E-02 | | 1.06E-02 | 3.40E-02 |
| | 696.49 | 99.49 | 6.72E-02 | | -4.93E-02 | 3.15E-02 |
| PM-145 | 36.85 | 21.70 | 2.15E-01 | 1.19E-01 | -1.74E-01 | 1.04E-01 |
| | 37.36 | 39.70 | 1.19E-01 | | 3.32E-02 | 5.76E-02 |
| | 42.30 | 15.10 | 2.90E-01 | | -3.27E-01 | 1.41E-01 |
| | 72.40 | 2.31 | 2.68E+00 | | -2.18E+00 | 1.32E+00 |
| PM-146 | 453.90 | 39.94 | 1.34E-01 | 1.34E-01 | -3.43E-02 | 6.38E-02 |
| | 735.90 | 14.01 | 3.86E-01 | | -8.08E-02 | 1.80E-01 |
| | 747.13 | 13.10 | 4.55E-01 | | 3.31E-02 | 2.13E-01 |
| ND-147 | 91.11 | 28.90 | 1.12E+02 | 1.12E+02 | 1.92E+02 | 5.52E+01 |
| | 531.02 | 13.10 | 1.98E+02 | | -1.12E+02 | 9.34E+01 |
| PM-149 | 285.90 | 3.10 | 5.32E+13 | 5.32E+13 | 2.96E+13 | 2.57E+13 |
| EU-152 | 121.78 | 20.50 | 2.03E-01 | 2.03E-01 | -8.07E-02 | 9.89E-02 |
| | 244.69 | 5.40 | 8.61E-01 | | -9.82E-01 | 4.16E-01 |
| | 344.27 | 19.13 | 2.61E-01 | | -6.52E-02 | 1.25E-01 |
| | 778.89 | 9.20 | 6.35E-01 | | -4.78E-02 | 2.97E-01 |
| | 964.01 | 10.40 | 7.76E-01 | | -2.03E+00 | 3.67E-01 |
| | 1085.78 | 7.22 | 9.83E-01 | | 4.06E-01 | 4.58E-01 |
| | 1112.02 | 9.60 | 7.12E-01 | | -1.77E-01 | 3.31E-01 |
| | 1407.95 | 14.94 | 4.60E-01 | | 1.15E-01 | 2.11E-01 |
| GD-153 | 97.43 | 31.30 | 1.85E-01 | 1.85E-01 | 6.49E-02 | 9.03E-02 |
| | 103.18 | 22.20 | 2.58E-01 | | -1.37E-01 | 1.26E-01 |
| EU-154 | 123.07 | 40.50 | 1.07E-01 | 1.07E-01 | 3.45E-02 | 5.19E-02 |
| | 723.30 | 19.70 | 3.35E-01 | | -5.01E-01 | 1.58E-01 |
| | 873.19 | 11.50 | 5.08E-01 | | -2.17E-02 | 2.36E-01 |
| | 996.32 | 10.30 | 6.37E-01 | | -3.82E-01 | 2.96E-01 |
| | 1004.76 | 17.90 | 4.04E-01 | | 1.38E-01 | 1.89E-01 |
| | 1274.45 | 35.50 | 1.92E-01 | | 3.92E-02 | 8.82E-02 |
| EU-155 | 86.50 | 30.90 | 1.84E-01 | 1.84E-01 | 5.11E-02 | 9.03E-02 |
| | 105.30 | 20.70 | 2.23E-01 | | 1.19E-01 | 1.09E-01 |
| EU-156 | 811.77 | 10.40 | 5.07E+01 | 5.07E+01 | -5.89E+00 | 2.36E+01 |
| | 1153.47 | 7.20 | 9.52E+01 | | -2.40E+00 | 4.44E+01 |
| | 1230.71 | 8.90 | 9.02E+01 | | 1.82E+01 | 4.24E+01 |
| HO-166M | 184.41 | 72.60 | 7.66E-02 | 7.66E-02 | 1.41E-01 | 3.73E-02 |
| | 280.45 | 29.60 | 1.75E-01 | | 8.30E-02 | 8.46E-02 |
| | 410.94 | 11.10 | 4.93E-01 | | 3.34E-01 | 2.36E-01 |
| | 711.69 | 54.10 | 1.08E-01 | | -3.83E-02 | 5.06E-02 |
| TM-171 | 66.72 | 0.14 | 4.29E+01 | 4.29E+01 | -3.50E+01 | 2.10E+01 |
| HF-172 | 67.35 | 5.31 | 1.12E+00 | 4.10E-01 | 1.08E-01 | 5.47E-01 |
| | 125.81 | 11.30 | 4.10E-01 | | -4.81E-01 | 2.00E-01 |
| LU-172 | 181.53 | 20.60 | 6.39E+03 | 3.34E+03 | -6.62E+02 | 3.10E+03 |
| | 900.72 | 29.81 | 5.79E+03 | | -2.15E+03 | 2.69E+03 |
| | 1093.66 | 62.50 | 3.34E+03 | | 9.10E+02 | 1.56E+03 |
| LU-173 | 100.72 | 5.24 | 9.58E-01 | 3.04E-01 | 3.02E-01 | 4.67E-01 |
| | 272.11 | 21.20 | 3.04E-01 | | -2.96E-02 | 1.47E-01 |
| HF-175 | 343.40 | 84.00 | 1.54E-01 | 1.54E-01 | -3.91E-02 | 7.39E-02 |
| LU-176 | 88.34 | 13.30 | 4.29E-01 | 5.15E-02 | -1.95E-01 | 2.10E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | LU-176 | 201.83 | | 86.00 | 5.22E-02 | 5.15E-02 | -1.93E-02 | 2.53E-02 |
| | | 306.78 | | 94.00 | 5.15E-02 | | -4.72E-03 | 2.48E-02 |
| | HF-181 | 133.02 | | 41.70 | 5.23E-01 | 3.46E-01 | -1.91E-01 | 2.54E-01 |
| | | 345.85 | | 17.20 | 1.46E+00 | | -3.64E-01 | 7.00E-01 |
| | | 482.03 | | 82.80 | 3.46E-01 | | 5.53E-02 | 1.65E-01 |
| | TA-182 | 67.75 | | 41.20 | 2.37E-01 | 2.37E-01 | 2.30E-02 | 1.16E-01 |
| | | 1121.30 | | 34.90 | 5.57E-01 | | 8.30E-01 | 2.66E-01 |
| | | 1189.05 | | 16.23 | 9.13E-01 | | 3.36E-02 | 4.28E-01 |
| | | 1221.41 | | 26.98 | 5.64E-01 | | -6.79E-02 | 2.64E-01 |
| | | 1231.02 | | 11.44 | 1.38E+00 | | 2.77E-01 | 6.47E-01 |
| | IR-192 | 308.46 | | 29.68 | 4.08E-01 | 2.59E-01 | 1.13E-01 | 1.96E-01 |
| | | 468.07 | | 48.10 | 2.59E-01 | | 3.16E-02 | 1.23E-01 |
| | HG-203 | 279.19 | | 77.30 | 3.00E-01 | 3.00E-01 | 2.34E-01 | 1.45E-01 |
| | TL-204 | 374.74 | | 94.11 | 5.65E-02 | 5.65E-02 | 8.17E-03 | 2.71E-02 |
| | | 899.15 | | 99.16 | 6.40E-02 | | -1.75E-02 | 2.98E-02 |
| | | 911.74 | | 91.10 | 1.38E-01 | | 3.49E-01 | 6.64E-02 |
| | BI-207 | 569.67 | | 97.72 | 4.97E-02 | 4.97E-02 | -1.29E-02 | 2.33E-02 |
| | | 1063.62 | | 74.90 | 1.08E-01 | | 9.86E-02 | 5.10E-02 |
| + | TL-208 | 583.14 | * | 30.22 | 2.62E-01 | 1.00E-01 | 1.17E+00 | 1.26E-01 |
| | | 860.37 | | 4.48 | 1.55E+00 | | 9.49E-01 | 7.31E-01 |
| | | 2614.66 | * | 35.85 | 1.00E-01 | | 1.00E+00 | 3.76E-02 |
| | BI-210M | 262.00 | | 45.00 | 1.06E-01 | 1.06E-01 | 3.44E-02 | 5.14E-02 |
| | | 300.00 | | 23.00 | 2.60E-01 | | -7.26E-01 | 1.26E-01 |
| | PB-210 | 46.50 | | 4.25 | 1.17E+00 | 1.17E+00 | 1.29E+00 | 5.73E-01 |
| | PB-211 | 404.84 | | 2.90 | 1.81E+00 | 1.81E+00 | -1.69E+00 | 8.64E-01 |
| | | 831.96 | | 2.90 | 2.09E+00 | | -1.15E-01 | 9.78E-01 |
| + | BI-212 | 727.17 | * | 11.80 | 8.66E-01 | 8.66E-01 | 9.03E-01 | 4.18E-01 |
| | | 1620.62 | | 2.75 | 1.62E+00 | | 1.29E-01 | 6.92E-01 |
| + | PB-212 | 238.63 | * | 44.60 | 2.20E-01 | 2.20E-01 | 1.22E+00 | 1.08E-01 |
| | | 300.09 | * | 3.41 | 2.55E+00 | | 1.89E+00 | 1.25E+00 |
| + | BI-214 | 609.31 | * | 46.30 | 2.14E-01 | 2.14E-01 | 8.68E-01 | 1.04E-01 |
| | | 1120.29 | * | 15.10 | 8.15E-01 | | 1.08E+00 | 3.91E-01 |
| | | 1764.49 | * | 15.80 | 4.14E-01 | | 9.20E-01 | 1.86E-01 |
| | | 2204.22 | * | 4.98 | 1.31E+00 | | 1.72E+00 | 5.73E-01 |
| + | PB-214 | 295.21 | * | 19.19 | 4.39E-01 | 2.11E-01 | 1.09E+00 | 2.15E-01 |
| | | 351.92 | * | 37.19 | 2.11E-01 | | 9.35E-01 | 1.03E-01 |
| | RN-219 | 401.80 | | 6.50 | 8.26E-01 | 8.26E-01 | 1.26E-01 | 3.96E-01 |
| | RA-223 | 323.87 | | 3.88 | 1.34E+00 | 1.34E+00 | -8.24E-01 | 6.46E-01 |
| + | RA-224 | 240.98 | * | 3.95 | 2.47E+00 | 2.47E+00 | 3.59E+00 | 1.21E+00 |
| | RA-225 | 40.00 | | 31.00 | 1.52E+01 | 1.52E+01 | 1.64E-01 | 7.39E+00 |
| + | RA-226 | 186.21 | * | 3.28 | 1.91E+00 | 1.91E+00 | 2.21E+00 | 9.32E-01 |
| | TH-227 | 50.10 | | 8.40 | 5.50E-01 | 5.11E-01 | -4.26E-01 | 2.68E-01 |
| | | 236.00 | | 11.50 | 5.11E-01 | | -3.53E+00 | 2.49E-01 |
| | | 256.20 | | 6.30 | 7.73E-01 | | -5.06E-02 | 3.73E-01 |
| + | AC-228 | 338.32 | * | 11.40 | 5.35E-01 | 2.94E-01 | 1.29E+00 | 2.59E-01 |
| | | 911.07 | * | 27.70 | 2.94E-01 | | 1.04E+00 | 1.40E-01 |
| | | 969.11 | * | 16.60 | 9.01E-01 | | 1.33E+00 | 4.37E-01 |
| | TH-230 | 48.44 | | 16.90 | 2.93E-01 | 2.93E-01 | 1.08E-01 | 1.43E-01 |
| | | 62.85 | | 4.60 | 1.19E+00 | | 1.86E-01 | 5.84E-01 |
| | | 67.67 | | 0.37 | 1.45E+01 | | 1.40E+00 | 7.09E+00 |
| | PA-231 | 283.67 | | 1.60 | 2.97E+00 | 2.44E+00 | -2.59E+00 | 1.43E+00 |
| | | 302.67 | | 2.30 | 2.44E+00 | | 6.52E-02 | 1.18E+00 |
| | TH-231 | 25.64 | | 14.70 | 4.67E-01 | 4.67E-01 | -2.29E+00 | 2.28E-01 |

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

| | Nuclide Name | Energy (keV) | | Yield(%) | Line MDA (pCi/grams) | Nuclide MDA (pCi/grams) | Activity (pCi/grams) | Dec. Level (pCi/grams) |
|---|---|---|---|---|---|---|---|---|
| | TH-231 | 84.21 | | 6.40 | 7.95E-01 | 4.67E-01 | -8.13E-01 | 3.89E-01 |
| | PA-233 | 311.98 | | 38.60 | 1.53E+00 | 1.53E+00 | -8.16E-01 | 7.32E-01 |
| | PA-234 | 131.20 | | 20.40 | 2.21E-01 | 2.21E-01 | 7.90E-02 | 1.08E-01 |
| | | 733.99 | | 8.80 | 6.22E-01 | | 1.15E-01 | 2.91E-01 |
| | | 946.00 | | 12.00 | 5.02E-01 | | -4.08E-01 | 2.33E-01 |
| | PA-234M | 1001.03 | | 0.92 | 7.67E+00 | 7.67E+00 | -1.76E+00 | 3.59E+00 |
| | TH-234 | 63.29 | | 3.80 | 1.49E+00 | 1.49E+00 | 1.49E+00 | 7.31E-01 |
| | U-235 | 143.76 | | 10.50 | 4.26E-01 | 4.26E-01 | 3.65E-01 | 2.07E-01 |
| | | 163.35 | | 4.70 | 9.13E-01 | | -5.55E-02 | 4.43E-01 |
| | | 205.31 | | 4.70 | 9.98E-01 | | 4.14E-01 | 4.84E-01 |
| | NP-237 | 86.50 | | 12.60 | 4.35E-01 | 4.35E-01 | 1.21E-01 | 2.13E-01 |
| | NP-239 | 106.10 | | 22.70 | 9.63E+11 | 9.63E+11 | 1.63E+11 | 4.69E+11 |
| | | 228.18 | | 10.70 | 2.10E+12 | | -2.72E+10 | 1.01E+12 |
| | | 277.60 | | 14.10 | 1.88E+12 | | 1.08E+12 | 9.11E+11 |
| | AM-241 | 59.54 | | 35.90 | 1.35E-01 | 1.35E-01 | 4.01E-02 | 6.57E-02 |
| + | AM-243 | 74.67 | * | 66.00 | 2.54E-01 | 2.54E-01 | 2.82E-01 | 1.26E-01 |
| | CM-243 | 209.75 | | 3.29 | 1.55E+00 | 3.84E-01 | 1.63E+00 | 7.50E-01 |
| | | 228.14 | | 10.60 | 4.28E-01 | | -5.56E-03 | 2.07E-01 |
| | | 277.60 | | 14.00 | 3.84E-01 | | 2.20E-01 | 1.86E-01 |

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

No Action Level results available for reporting purposes.

# DATA REVIEW COMMENTS REPORT

| Creation Date | Comment | User |
|---|---|---|

No Data Review Comments Entered.

Analysis Report for 1707087-20

HTC-A03-S003-3036-01

**********
***** S P E C T R A L D A T A R E P O R T *****
**********

Sample Title: HTC-A03-S003-3036-01

Elapsed Live time: 3600
Elapsed Real Time: 3601

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17: | 0 | 0 | 59 | 81 | 93 | 143 | 504 | 189 |
| 25: | 79 | 67 | 83 | 64 | 70 | 71 | 64 | 78 |
| 33: | 78 | 97 | 69 | 72 | 74 | 80 | 74 | 83 |
| 41: | 73 | 82 | 74 | 75 | 75 | 106 | 148 | 122 |
| 49: | 93 | 91 | 108 | 103 | 106 | 113 | 101 | 102 |
| 57: | 103 | 111 | 124 | 136 | 117 | 119 | 150 | 251 |
| 65: | 167 | 174 | 165 | 142 | 161 | 141 | 146 | 179 |
| 73: | 163 | 190 | 365 | 321 | 378 | 478 | 203 | 135 |
| 81: | 134 | 122 | 135 | 147 | 161 | 114 | 161 | 248 |
| 89: | 148 | 185 | 159 | 141 | 315 | 243 | 133 | 111 |
| 97: | 88 | 87 | 105 | 118 | 99 | 90 | 95 | 100 |
| 105: | 98 | 102 | 120 | 96 | 85 | 97 | 95 | 73 |
| 113: | 101 | 88 | 90 | 97 | 90 | 85 | 84 | 75 |
| 121: | 89 | 74 | 94 | 76 | 85 | 100 | 65 | 90 |
| 129: | 110 | 132 | 73 | 86 | 96 | 82 | 83 | 74 |
| 137: | 96 | 73 | 87 | 78 | 76 | 79 | 76 | 98 |
| 145: | 97 | 82 | 79 | 49 | 86 | 88 | 80 | 68 |
| 153: | 72 | 84 | 82 | 77 | 72 | 79 | 75 | 80 |
| 161: | 70 | 69 | 68 | 59 | 77 | 82 | 67 | 73 |
| 169: | 74 | 61 | 66 | 75 | 75 | 69 | 82 | 58 |
| 177: | 62 | 65 | 80 | 66 | 66 | 79 | 74 | 74 |
| 185: | 63 | 179 | 146 | 72 | 49 | 67 | 61 | 72 |
| 193: | 69 | 64 | 63 | 59 | 73 | 58 | 71 | 52 |
| 201: | 70 | 64 | 55 | 72 | 61 | 83 | 60 | 60 |
| 209: | 84 | 108 | 64 | 66 | 48 | 46 | 61 | 64 |
| 217: | 55 | 52 | 58 | 55 | 67 | 66 | 69 | 72 |
| 225: | 54 | 61 | 58 | 53 | 49 | 55 | 58 | 49 |
| 233: | 57 | 60 | 68 | 58 | 60 | 206 | 598 | 258 |
| 241: | 100 | 174 | 95 | 48 | 41 | 41 | 34 | 34 |
| 249: | 47 | 42 | 32 | 51 | 41 | 35 | 57 | 36 |
| 257: | 34 | 34 | 40 | 40 | 31 | 41 | 34 | 45 |
| 265: | 28 | 36 | 30 | 47 | 46 | 69 | 78 | 45 |
| 273: | 37 | 31 | 46 | 36 | 43 | 54 | 44 | 42 |
| 281: | 35 | 26 | 49 | 28 | 26 | 36 | 29 | 43 |
| 289: | 39 | 26 | 32 | 39 | 42 | 43 | 139 | 185 |
| 297: | 67 | 30 | 45 | 67 | 63 | 42 | 26 | 35 |
| 305: | 31 | 30 | 31 | 29 | 28 | 29 | 30 | 29 |
| 313: | 25 | 19 | 27 | 32 | 34 | 35 | 27 | 41 |
| 321: | 32 | 36 | 28 | 30 | 41 | 29 | 33 | 47 |
| 329: | 39 | 34 | 28 | 30 | 43 | 26 | 29 | 22 |
| 337: | 38 | 97 | 113 | 45 | 25 | 29 | 16 | 32 |
| 345: | 27 | 21 | 31 | 31 | 29 | 20 | 92 | 282 |
| 353: | 205 | 43 | 27 | 26 | 40 | 24 | 27 | 34 |
| 361: | 25 | 23 | 19 | 27 | 26 | 30 | 27 | 20 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 369: | 22 | 17 | 25 | 26 | 15 | 26 | 31 | 31 |

Sample Title: HTC-A03-S003-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 377: | 22 | 23 | 24 | 27 | 28 | 22 | 24 | 18 |
| 385: | 19 | 32 | 25 | 21 | 24 | 21 | 30 | 21 |
| 393: | 19 | 24 | 22 | 20 | 32 | 24 | 24 | 36 |
| 401: | 22 | 22 | 26 | 22 | 25 | 21 | 21 | 29 |
| 409: | 29 | 40 | 14 | 25 | 15 | 26 | 16 | 20 |
| 417: | 20 | 21 | 23 | 31 | 17 | 15 | 25 | 10 |
| 425: | 19 | 16 | 25 | 18 | 26 | 16 | 20 | 16 |
| 433: | 19 | 15 | 26 | 21 | 21 | 25 | 23 | 23 |
| 441: | 18 | 27 | 13 | 24 | 18 | 19 | 18 | 17 |
| 449: | 17 | 16 | 20 | 22 | 21 | 16 | 13 | 18 |
| 457: | 25 | 22 | 28 | 20 | 21 | 29 | 43 | 41 |
| 465: | 16 | 19 | 15 | 13 | 17 | 20 | 16 | 15 |
| 473: | 12 | 17 | 19 | 16 | 18 | 21 | 20 | 24 |
| 481: | 19 | 21 | 30 | 15 | 19 | 19 | 21 | 13 |
| 489: | 18 | 11 | 21 | 14 | 16 | 16 | 18 | 19 |
| 497: | 15 | 25 | 20 | 15 | 15 | 24 | 14 | 15 |
| 505: | 11 | 14 | 25 | 22 | 25 | 59 | 80 | 53 |
| 513: | 33 | 17 | 18 | 12 | 18 | 15 | 14 | 13 |
| 521: | 17 | 19 | 10 | 12 | 11 | 23 | 18 | 10 |
| 529: | 20 | 14 | 12 | 14 | 8 | 16 | 21 | 9 |
| 537: | 17 | 11 | 15 | 18 | 11 | 24 | 9 | 14 |
| 545: | 15 | 14 | 19 | 26 | 16 | 18 | 13 | 18 |
| 553: | 15 | 10 | 20 | 9 | 15 | 14 | 12 | 12 |
| 561: | 15 | 20 | 19 | 12 | 16 | 8 | 8 | 6 |
| 569: | 11 | 13 | 10 | 15 | 18 | 11 | 18 | 15 |
| 577: | 17 | 10 | 15 | 15 | 14 | 38 | 151 | 138 |
| 585: | 33 | 24 | 11 | 12 | 15 | 12 | 11 | 11 |
| 593: | 14 | 17 | 14 | 17 | 27 | 21 | 15 | 11 |
| 601: | 13 | 8 | 13 | 13 | 7 | 18 | 12 | 42 |
| 609: | 176 | 150 | 38 | 15 | 15 | 27 | 22 | 11 |
| 617: | 16 | 13 | 15 | 15 | 15 | 10 | 13 | 20 |
| 625: | 8 | 10 | 13 | 11 | 17 | 13 | 10 | 9 |
| 633: | 11 | 14 | 13 | 9 | 15 | 16 | 14 | 7 |
| 641: | 16 | 12 | 13 | 8 | 10 | 9 | 8 | 14 |
| 649: | 13 | 11 | 17 | 12 | 12 | 16 | 10 | 16 |
| 657: | 11 | 11 | 12 | 7 | 8 | 14 | 13 | 16 |
| 665: | 17 | 17 | 13 | 11 | 13 | 12 | 16 | 14 |
| 673: | 14 | 10 | 10 | 16 | 11 | 8 | 8 | 13 |
| 681: | 15 | 8 | 14 | 14 | 12 | 16 | 15 | 14 |
| 689: | 14 | 14 | 10 | 12 | 16 | 6 | 13 | 8 |
| 697: | 16 | 11 | 8 | 18 | 20 | 10 | 14 | 8 |
| 705: | 15 | 11 | 14 | 10 | 11 | 11 | 17 | 12 |
| 713: | 10 | 10 | 13 | 11 | 21 | 11 | 13 | 10 |
| 721: | 9 | 15 | 15 | 18 | 14 | 21 | 38 | 38 |
| 729: | 15 | 11 | 9 | 12 | 13 | 13 | 3 | 11 |
| 737: | 9 | 7 | 7 | 9 | 11 | 17 | 12 | 11 |
| 745: | 15 | 11 | 9 | 6 | 11 | 13 | 7 | 8 |
| 753: | 12 | 10 | 21 | 13 | 11 | 13 | 8 | 11 |
| 761: | 8 | 6 | 12 | 10 | 8 | 7 | 19 | 24 |
| 769: | 17 | 12 | 11 | 16 | 17 | 8 | 12 | 9 |
| 777: | 13 | 10 | 11 | 11 | 10 | 7 | 13 | 9 |
| 785: | 12 | 19 | 15 | 8 | 9 | 10 | 13 | 6 |
| 793: | 7 | 18 | 20 | 18 | 21 | 8 | 8 | 12 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 801: | 13 | 11 | 12 | 21 | 13 | 12 | 10 | 9 |

Sample Title: HTC-A03-S003-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 809: | 11 | 8 | 11 | 9 | 13 | 7 | 5 | 9 |
| 817: | 11 | 8 | 11 | 8 | 7 | 8 | 7 | 9 |
| 825: | 13 | 5 | 10 | 6 | 6 | 9 | 12 | 15 |
| 833: | 10 | 8 | 11 | 11 | 14 | 14 | 13 | 12 |
| 841: | 11 | 8 | 7 | 7 | 13 | 7 | 10 | 8 |
| 849: | 9 | 9 | 10 | 8 | 6 | 9 | 10 | 10 |
| 857: | 18 | 14 | 8 | 16 | 16 | 9 | 9 | 6 |
| 865: | 10 | 10 | 11 | 13 | 9 | 9 | 7 | 10 |
| 873: | 6 | 5 | 9 | 12 | 13 | 11 | 7 | 7 |
| 881: | 4 | 13 | 12 | 5 | 7 | 9 | 8 | 10 |
| 889: | 9 | 12 | 13 | 11 | 12 | 13 | 10 | 9 |
| 897: | 11 | 2 | 11 | 8 | 11 | 10 | 7 | 12 |
| 905: | 11 | 9 | 7 | 19 | 16 | 45 | 84 | 68 |
| 913: | 16 | 7 | 9 | 9 | 4 | 4 | 5 | 12 |
| 921: | 8 | 5 | 7 | 8 | 8 | 9 | 11 | 6 |
| 929: | 5 | 7 | 13 | 10 | 17 | 17 | 12 | 7 |
| 937: | 4 | 5 | 8 | 13 | 3 | 9 | 9 | 11 |
| 945: | 7 | 5 | 10 | 8 | 7 | 11 | 23 | 11 |
| 953: | 9 | 7 | 6 | 9 | 9 | 7 | 12 | 10 |
| 961: | 14 | 7 | 9 | 17 | 26 | 17 | 10 | 25 |
| 969: | 78 | 42 | 11 | 5 | 10 | 12 | 7 | 5 |
| 977: | 6 | 8 | 5 | 8 | 3 | 5 | 5 | 12 |
| 985: | 5 | 5 | 10 | 7 | 11 | 11 | 8 | 9 |
| 993: | 5 | 6 | 6 | 13 | 13 | 10 | 7 | 11 |
| 1001: | 19 | 11 | 10 | 5 | 10 | 12 | 6 | 11 |
| 1009: | 5 | 7 | 4 | 5 | 7 | 11 | 7 | 9 |
| 1017: | 7 | 9 | 6 | 10 | 12 | 6 | 6 | 9 |
| 1025: | 7 | 10 | 13 | 10 | 12 | 10 | 12 | 12 |
| 1033: | 11 | 2 | 14 | 6 | 13 | 3 | 8 | 6 |
| 1041: | 6 | 12 | 8 | 7 | 15 | 8 | 8 | 3 |
| 1049: | 13 | 7 | 8 | 5 | 9 | 8 | 12 | 8 |
| 1057: | 8 | 4 | 8 | 6 | 16 | 10 | 13 | 17 |
| 1065: | 17 | 9 | 6 | 8 | 8 | 6 | 13 | 6 |
| 1073: | 6 | 6 | 8 | 7 | 7 | 16 | 5 | 7 |
| 1081: | 8 | 11 | 7 | 7 | 7 | 11 | 11 | 9 |
| 1089: | 4 | 8 | 10 | 6 | 8 | 14 | 10 | 10 |
| 1097: | 8 | 10 | 10 | 13 | 6 | 6 | 6 | 9 |
| 1105: | 7 | 7 | 10 | 13 | 4 | 11 | 6 | 4 |
| 1113: | 12 | 10 | 9 | 6 | 10 | 15 | 23 | 39 |
| 1121: | 33 | 15 | 7 | 14 | 9 | 8 | 6 | 7 |
| 1129: | 14 | 8 | 8 | 9 | 9 | 7 | 8 | 8 |
| 1137: | 11 | 13 | 9 | 8 | 12 | 9 | 8 | 9 |
| 1145: | 12 | 9 | 8 | 8 | 10 | 15 | 7 | 5 |
| 1153: | 4 | 14 | 8 | 11 | 7 | 12 | 11 | 7 |
| 1161: | 12 | 11 | 11 | 10 | 6 | 11 | 14 | 7 |
| 1169: | 9 | 8 | 12 | 12 | 9 | 19 | 8 | 11 |
| 1177: | 11 | 10 | 13 | 14 | 16 | 10 | 14 | 9 |
| 1185: | 16 | 22 | 6 | 16 | 7 | 11 | 8 | 5 |
| 1193: | 10 | 9 | 12 | 5 | 10 | 15 | 15 | 16 |
| 1201: | 10 | 11 | 11 | 14 | 4 | 15 | 6 | 8 |
| 1209: | 9 | 9 | 8 | 13 | 9 | 12 | 7 | 16 |
| 1217: | 12 | 10 | 8 | 20 | 12 | 10 | 7 | 9 |
| 1225: | 13 | 7 | 9 | 14 | 17 | 7 | 11 | 12 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1233: | 11 | 6 | 15 | 13 | 20 | 28 | 15 | 9 |

Sample Title: HTC-A03-S003-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1241: | 8 | 14 | 15 | 7 | 14 | 13 | 8 | 9 |
| 1249: | 10 | 9 | 14 | 9 | 9 | 9 | 9 | 4 |
| 1257: | 9 | 12 | 8 | 8 | 13 | 7 | 9 | 12 |
| 1265: | 10 | 8 | 7 | 13 | 6 | 7 | 8 | 4 |
| 1273: | 10 | 6 | 5 | 4 | 7 | 4 | 5 | 8 |
| 1281: | 10 | 8 | 7 | 8 | 8 | 6 | 3 | 11 |
| 1289: | 4 | 5 | 10 | 4 | 2 | 7 | 6 | 9 |
| 1297: | 4 | 6 | 11 | 3 | 9 | 5 | 3 | 5 |
| 1305: | 4 | 6 | 4 | 5 | 4 | 6 | 4 | 2 |
| 1313: | 3 | 2 | 6 | 6 | 6 | 10 | 3 | 8 |
| 1321: | 6 | 7 | 3 | 3 | 2 | 7 | 1 | 5 |
| 1329: | 4 | 9 | 2 | 5 | 6 | 3 | 5 | 4 |
| 1337: | 3 | 6 | 0 | 4 | 1 | 7 | 6 | 7 |
| 1345: | 5 | 3 | 9 | 7 | 5 | 3 | 6 | 4 |
| 1353: | 1 | 4 | 0 | 2 | 1 | 3 | 5 | 3 |
| 1361: | 4 | 4 | 8 | 5 | 5 | 5 | 1 | 1 |
| 1369: | 4 | 3 | 3 | 2 | 6 | 7 | 3 | 5 |
| 1377: | 14 | 13 | 10 | 5 | 3 | 5 | 1 | 1 |
| 1385: | 4 | 5 | 3 | 1 | 4 | 3 | 2 | 3 |
| 1393: | 3 | 4 | 2 | 6 | 5 | 2 | 3 | 6 |
| 1401: | 3 | 9 | 7 | 4 | 3 | 3 | 7 | 10 |
| 1409: | 8 | 4 | 0 | 2 | 3 | 2 | 2 | 3 |
| 1417: | 2 | 4 | 1 | 4 | 5 | 0 | 2 | 2 |
| 1425: | 7 | 3 | 4 | 6 | 4 | 5 | 2 | 1 |
| 1433: | 3 | 3 | 2 | 1 | 3 | 4 | 1 | 5 |
| 1441: | 1 | 4 | 6 | 1 | 3 | 2 | 4 | 5 |
| 1449: | 1 | 4 | 6 | 1 | 1 | 2 | 4 | 3 |
| 1457: | 11 | 22 | 125 | 423 | 448 | 141 | 20 | 11 |
| 1465: | 17 | 9 | 4 | 0 | 1 | 1 | 1 | 3 |
| 1473: | 3 | 1 | 1 | 1 | 6 | 0 | 3 | 5 |
| 1481: | 3 | 1 | 2 | 1 | 0 | 3 | 2 | 2 |
| 1489: | 2 | 2 | 0 | 1 | 2 | 2 | 3 | 3 |
| 1497: | 3 | 2 | 1 | 2 | 3 | 3 | 2 | 2 |
| 1505: | 2 | 3 | 3 | 3 | 4 | 5 | 2 | 4 |
| 1513: | 2 | 4 | 3 | 0 | 2 | 3 | 1 | 2 |
| 1521: | 1 | 2 | 1 | 0 | 5 | 1 | 1 | 2 |
| 1529: | 1 | 5 | 0 | 2 | 1 | 2 | 0 | 2 |
| 1537: | 2 | 1 | 5 | 2 | 1 | 2 | 5 | 4 |
| 1545: | 3 | 4 | 1 | 1 | 1 | 2 | 0 | 3 |
| 1553: | 3 | 3 | 2 | 0 | 1 | 1 | 1 | 0 |
| 1561: | 2 | 1 | 0 | 1 | 2 | 0 | 1 | 2 |
| 1569: | 1 | 0 | 3 | 1 | 2 | 3 | 3 | 0 |
| 1577: | 2 | 1 | 1 | 1 | 1 | 4 | 4 | 2 |
| 1585: | 3 | 0 | 5 | 7 | 4 | 0 | 2 | 4 |
| 1593: | 5 | 3 | 3 | 2 | 1 | 1 | 0 | 1 |
| 1601: | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 0 |
| 1609: | 1 | 2 | 0 | 1 | 1 | 2 | 2 | 1 |
| 1617: | 1 | 1 | 2 | 4 | 0 | 3 | 1 | 2 |
| 1625: | 1 | 0 | 2 | 0 | 2 | 5 | 2 | 3 |
| 1633: | 2 | 2 | 3 | 2 | 5 | 2 | 2 | 1 |
| 1641: | 1 | 0 | 2 | 2 | 1 | 1 | 0 | 3 |
| 1649: | 2 | 1 | 1 | 0 | 1 | 2 | 0 | 2 |
| 1657: | 3 | 2 | 2 | 4 | 11 | 3 | 1 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1665: | 2 | 2 | 1 | 1 | 0 | 2 | 1 | 0 |

Sample Title: HTC-A03-S003-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1673: | 1 | 0 | 0 | 1 | 1 | 3 | 3 | 1 |
| 1681: | 0 | 1 | 5 | 1 | 1 | 1 | 0 | 1 |
| 1689: | 1 | 2 | 0 | 0 | 0 | 2 | 1 | 1 |
| 1697: | 0 | 0 | 0 | 3 | 1 | 0 | 2 | 2 |
| 1705: | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| 1713: | 0 | 1 | 1 | 3 | 1 | 3 | 1 | 0 |
| 1721: | 1 | 1 | 0 | 1 | 1 | 4 | 5 | 4 |
| 1729: | 2 | 2 | 1 | 0 | 0 | 3 | 3 | 1 |
| 1737: | 1 | 1 | 2 | 3 | 0 | 0 | 0 | 1 |
| 1745: | 1 | 1 | 0 | 3 | 0 | 2 | 1 | 2 |
| 1753: | 2 | 0 | 0 | 1 | 2 | 1 | 1 | 2 |
| 1761: | 0 | 2 | 14 | 31 | 18 | 5 | 0 | 5 |
| 1769: | 1 | 2 | 1 | 2 | 1 | 0 | 1 | 0 |
| 1777: | 3 | 4 | 1 | 2 | 0 | 1 | 0 | 0 |
| 1785: | 1 | 0 | 2 | 1 | 4 | 2 | 1 | 1 |
| 1793: | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 1801: | 2 | 0 | 1 | 1 | 2 | 1 | 0 | 3 |
| 1809: | 0 | 1 | 3 | 2 | 0 | 2 | 0 | 1 |
| 1817: | 1 | 0 | 1 | 2 | 2 | 0 | 4 | 1 |
| 1825: | 0 | 2 | 1 | 1 | 2 | 0 | 1 | 1 |
| 1833: | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 |
| 1841: | 2 | 0 | 2 | 1 | 1 | 2 | 4 | 3 |
| 1849: | 2 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| 1857: | 3 | 1 | 0 | 0 | 1 | 2 | 2 | 1 |
| 1865: | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 2 |
| 1873: | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 1 |
| 1881: | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 |
| 1889: | 1 | 0 | 3 | 1 | 0 | 2 | 1 | 1 |
| 1897: | 3 | 0 | 1 | 5 | 0 | 1 | 1 | 2 |
| 1905: | 2 | 1 | 3 | 2 | 2 | 5 | 1 | 0 |
| 1913: | 0 | 2 | 0 | 2 | 2 | 1 | 0 | 1 |
| 1921: | 1 | 0 | 3 | 1 | 1 | 0 | 1 | 3 |
| 1929: | 0 | 0 | 3 | 2 | 0 | 2 | 1 | 2 |
| 1937: | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 2 |
| 1945: | 1 | 1 | 4 | 1 | 2 | 1 | 4 | 1 |
| 1953: | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 1 |
| 1961: | 1 | 3 | 2 | 0 | 0 | 1 | 2 | 1 |
| 1969: | 1 | 1 | 1 | 1 | 0 | 3 | 0 | 1 |
| 1977: | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 0 |
| 1985: | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 2 |
| 1993: | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2001: | 0 | 2 | 4 | 0 | 2 | 0 | 1 | 3 |
| 2009: | 1 | 2 | 1 | 0 | 0 | 3 | 1 | 2 |
| 2017: | 1 | 0 | 0 | 1 | 4 | 1 | 3 | 0 |
| 2025: | 0 | 1 | 4 | 0 | 3 | 1 | 2 | 3 |
| 2033: | 2 | 1 | 0 | 0 | 0 | 2 | 1 | 2 |
| 2041: | 0 | 1 | 1 | 4 | 1 | 2 | 0 | 3 |
| 2049: | 0 | 1 | 1 | 2 | 1 | 2 | 0 | 0 |
| 2057: | 4 | 1 | 0 | 2 | 2 | 3 | 0 | 2 |
| 2065: | 1 | 2 | 2 | 1 | 2 | 1 | 0 | 0 |
| 2073: | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 1 |
| 2081: | 0 | 2 | 1 | 2 | 1 | 0 | 2 | 2 |
| 2089: | 0 | 2 | 1 | 0 | 1 | 0 | 2 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2097: | 2 | 0 | 1 | 5 | 3 | 3 | 4 | 2 |

Sample Title: HTC-A03-S003-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2105: | 0 | 1 | 3 | 2 | 4 | 1 | 0 | 0 |
| 2113: | 1 | 0 | 2 | 0 | 3 | 1 | 1 | 0 |
| 2121: | 0 | 1 | 1 | 2 | 0 | 0 | 2 | 2 |
| 2129: | 1 | 2 | 2 | 1 | 0 | 4 | 1 | 0 |
| 2137: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 2145: | 0 | 0 | 0 | 1 | 3 | 1 | 1 | 0 |
| 2153: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 1 |
| 2161: | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 5 |
| 2169: | 1 | 3 | 0 | 0 | 0 | 1 | 3 | 1 |
| 2177: | 3 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| 2185: | 3 | 0 | 1 | 3 | 0 | 0 | 0 | 1 |
| 2193: | 0 | 3 | 1 | 0 | 2 | 1 | 2 | 0 |
| 2201: | 3 | 10 | 8 | 4 | 2 | 2 | 2 | 3 |
| 2209: | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 3 |
| 2217: | 5 | 1 | 0 | 0 | 3 | 1 | 2 | 1 |
| 2225: | 1 | 2 | 0 | 3 | 2 | 0 | 0 | 1 |
| 2233: | 3 | 3 | 0 | 1 | 1 | 1 | 1 | 0 |
| 2241: | 0 | 2 | 2 | 2 | 2 | 1 | 1 | 3 |
| 2249: | 0 | 1 | 2 | 1 | 3 | 1 | 1 | 0 |
| 2257: | 1 | 1 | 1 | 4 | 0 | 1 | 2 | 1 |
| 2265: | 1 | 2 | 0 | 4 | 0 | 0 | 2 | 0 |
| 2273: | 0 | 1 | 2 | 0 | 1 | 1 | 1 | 1 |
| 2281: | 1 | 0 | 1 | 4 | 2 | 0 | 1 | 2 |
| 2289: | 1 | 1 | 1 | 1 | 2 | 2 | 0 | 1 |
| 2297: | 1 | 1 | 1 | 1 | 2 | 0 | 3 | 1 |
| 2305: | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 2313: | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 |
| 2321: | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 5 |
| 2329: | 0 | 2 | 0 | 2 | 2 | 1 | 1 | 1 |
| 2337: | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 3 |
| 2345: | 0 | 0 | 1 | 1 | 2 | 0 | 2 | 3 |
| 2353: | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 4 |
| 2361: | 2 | 1 | 2 | 1 | 1 | 0 | 0 | 3 |
| 2369: | 0 | 3 | 0 | 0 | 2 | 2 | 2 | 0 |
| 2377: | 1 | 3 | 4 | 2 | 1 | 0 | 2 | 0 |
| 2385: | 1 | 3 | 1 | 1 | 4 | 0 | 0 | 0 |
| 2393: | 2 | 2 | 1 | 0 | 3 | 1 | 0 | 0 |
| 2401: | 2 | 0 | 1 | 0 | 0 | 2 | 1 | 1 |
| 2409: | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 2 |
| 2417: | 4 | 2 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2425: | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 2 |
| 2433: | 1 | 0 | 2 | 2 | 0 | 1 | 0 | 0 |
| 2441: | 0 | 1 | 0 | 2 | 0 | 1 | 3 | 1 |
| 2449: | 0 | 2 | 0 | 1 | 1 | 0 | 0 | 2 |
| 2457: | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 |
| 2465: | 3 | 3 | 0 | 1 | 0 | 0 | 2 | 0 |
| 2473: | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 0 |
| 2481: | 0 | 3 | 1 | 0 | 0 | 1 | 1 | 0 |
| 2489: | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 1 |
| 2497: | 0 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 2505: | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2513: | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 |
| 2521: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2529: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

Sample Title: HTC-A03-S003-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2537: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2545: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2553: | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 0 |
| 2561: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2569: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2577: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2585: | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 2593: | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 2601: | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 2609: | 1 | 2 | 7 | 26 | 33 | 33 | 9 | 2 |
| 2617: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2625: | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 |
| 2633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2649: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2657: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2665: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 2673: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 2681: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2689: | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 2697: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2705: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 2713: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2721: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 |
| 2729: | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 |
| 2737: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2745: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 2753: | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 1 |
| 2761: | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 |
| 2769: | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 |
| 2777: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 2785: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2793: | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2801: | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2809: | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2817: | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 2825: | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 |
| 2833: | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 |
| 2841: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2857: | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 0 |
| 2865: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2873: | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 2881: | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2889: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 2897: | 1 | 0 | 2 | 0 | 0 | 0 | 1 | 0 |
| 2905: | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 |
| 2913: | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 2921: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2929: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 2937: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 2945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2953: | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2961: | 0 | 0 | 0 | 2 | 1 | 1 | 0 | 0 |

Sample Title: HTC-A03-S003-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2969: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2977: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| 2985: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2993: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3001: | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3009: | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| 3017: | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| 3025: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3033: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3041: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 3049: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3057: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3065: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3073: | 1 | 1 | 1 | 0 | 2 | 1 | 0 | 0 |
| 3081: | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 |
| 3089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 3097: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3105: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3113: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3121: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3129: | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 3137: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 3145: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3153: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3161: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3169: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3177: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3185: | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 3 |
| 3193: | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3201: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3209: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3217: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3225: | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| 3233: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3241: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3249: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3257: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3265: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3273: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3281: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3289: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3297: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3305: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3313: | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3321: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3329: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3337: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3345: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3353: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3361: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 3369: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3377: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3385: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3393: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-3036-01

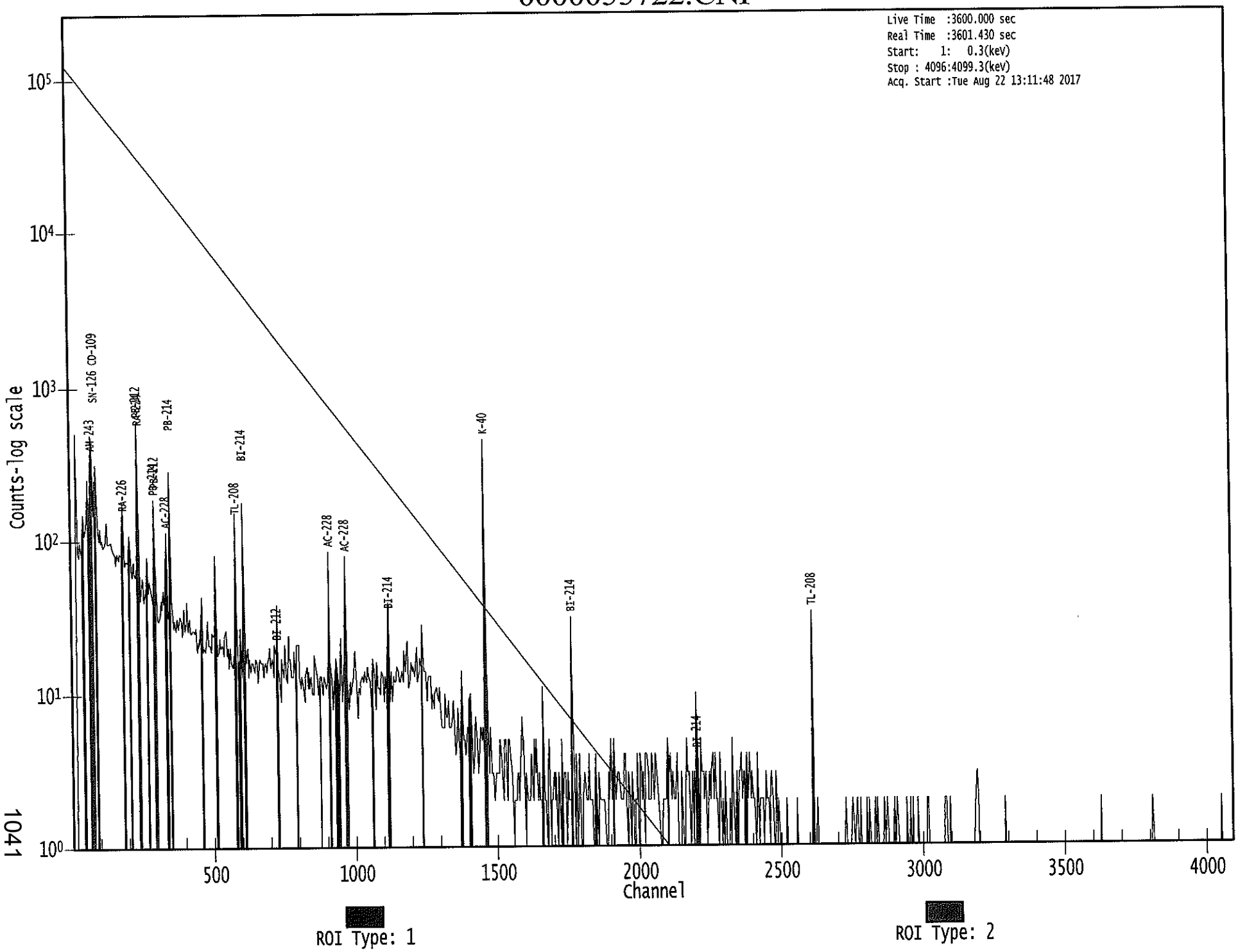
| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3401: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3409: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3417: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3425: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3433: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3441: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3449: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3457: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3465: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3473: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3481: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| 3489: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3497: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3505: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3513: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 3521: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3529: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3537: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3545: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3553: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3561: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3569: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3577: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3585: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3593: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3601: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3609: | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 3617: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3625: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 3633: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3641: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3649: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3657: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3665: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 3673: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3681: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3689: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3697: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 3705: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3713: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3721: | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3729: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3737: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3745: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3753: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3761: | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3769: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3777: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3785: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3793: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3801: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 3809: | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| 3817: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3825: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Sample Title: HTC-A03-S003-3036-01

| Channel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3833: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3841: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3849: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3857: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 |
| 3865: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 3873: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3881: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3889: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3897: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3905: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 3913: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 3921: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 3929: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3937: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3945: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3953: | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| 3961: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3969: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 3977: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3985: | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 |
| 3993: | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4001: | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| 4009: | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 4017: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4025: | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| 4033: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4041: | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 4049: | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 |
| 4057: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| 4065: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4073: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 4081: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 4089: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# 0000055722.CNF



8/22

```
*********************************************************************
*****          G E N I E   Q U A L I T Y   A S S U R A N C E        *****
*********************************************************************
```

Last Results Report
8/22/17 5:25:35 AM

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000001GAF-16C.QCK

Detector: GE1
Geometry: <None>
Certificate: GAF-16
Sample ID: QA Calibration C
Sample Desc: QA Count
Sample Quantity: 1.0000E+000
Sample Date: 10/1/16 12:00:00 PM
Measurement Date: 8/22/17 5:09:52 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 928.2 seconds

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| Peak centroid 59.54 kev | 5.9992E+001 | |
| Boundary Limits: [ 5.800E+001, 6.100E+001] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak centroid 661.65 kev | 6.6180E+002 | |
| Boundary Limits: [ 6.600E+002, 6.630E+002] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak centroid 1332.49 ke | 1.3325E+003 | |
| Boundary Limits: [ 1.331E+003, 1.334E+003] | | < : : : > |
| Peak centroid 1836.01 ke | 1.8357E+003 | |
| Boundary Limits: [ 1.834E+003, 1.838E+003] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak FWHM Am-241 | 1.4334E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Peak FWHM Cs-137 | 1.7953E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Peak FWHM Co-60 | 2.1260E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Peak FWHM Y-88 | 2.3962E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Decay corrected activity | 1.4983E+004 | |
| Boundary Limits: [ 1.254E-002, 1.881E-002] | | < : : : > |
| Decay corrected activity | 6.5758E+003 | |
| Boundary Limits: [ 5.134E-003, 7.700E-003] | | < : : : > |

Decay corrected activity 1.0565E+004
Boundary Limits: [ 8.130E-003, 1.220E-002] < : : : >

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| Decay corrected activity Boundary Limits: [ 1.690E-002, 2.534E-002] | 1.8655E+004 | < : : : > |

Flags Key:
LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

```
*************************************************************************
*****          G E N I E   Q U A L I T Y   A S S U R A N C E          *****
*************************************************************************
```

Last Results Report
8/22/17 5:25:46 AM

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000002GAS-1601C.QC

Detector: GE2
Geometry: <None>
Certificate: GAS-1601
Sample ID: QA Calibration C
Sample Desc: QA Count
Sample Quantity: 1.0000E+000
Sample Date: 10/1/16 12:00:00 PM
Measurement Date: 8/22/17 5:09:59 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 924.6 seconds

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| Peak centroid 59.54 kev | 6.0000E+001 | |
| Boundary Limits: [ 5.800E+001, 6.100E+001] | | < : : : > |
| Peak centroid 661.65 kev | 6.6137E+002 | |
| Boundary Limits: [ 6.600E+002, 6.630E+002] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak centroid 1332.49 ke | 1.3318E+003 | |
| Boundary Limits: [ 1.331E+003, 1.334E+003] | | < : : : > |
| Peak centroid 1836.01 ke | 1.8351E+003 | |
| Boundary Limits: [ 1.833E+003, 1.838E+003] | | < : : : > |
| Peak FWHM Am-241 | 1.2800E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak FWHM Cs-137 | 2.0264E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak FWHM Co-60 | 2.1169E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak FWHM Y-88 | 2.5299E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Decay corrected activity | 1.4598E+005 | |
| Boundary Limits: [ 1.190E-001, 1.785E-001] | | < : : : > |

Decay corrected activity 7.2867E+004
Boundary Limits: [ 5.718E-002, 8.577E-002] < : : : >

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| Decay corrected activity<br>Boundary Limits: [ 7.706E-002, 1.156E-001] | 1.0455E+005 | < : : : > |
| Decay corrected activity<br>Boundary Limits: [ 1.602E-001, 2.403E-001]<br>Trend Test: The last 9 samples exhibit a bias trend. | 2.0776E+005 | < : : : > |

Flags Key:
LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

```
*****************************************************************************
*****        G E N I E   Q U A L I T Y   A S S U R A N C E          *****
*****************************************************************************
```

Last Results Report
8/22/17 5:25:57 AM

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000003GAS-1602C.QC

Detector: GE3
Geometry: <None>
Certificate: GAS-1602
Sample ID: QA Calibration C
Sample Desc: QA Count
Sample Quantity: 1.0000E+000
Sample Date: 10/1/16 12:00:00 PM
Measurement Date: 8/22/17 5:10:06 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 933.5 seconds

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| Peak centroid 59.54 kev | 5.9859E+001 | |
| Boundary Limits: [ 5.800E+001, 6.100E+001] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak centroid 661.65 kev | 6.6179E+002 | |
| Boundary Limits: [ 6.600E+002, 6.630E+002] | | < : : : > |
| Peak centroid 1332.49 ke | 1.3325E+003 | |
| Boundary Limits: [ 1.330E+003, 1.334E+003] | | < : : : > |
| Peak centroid 1836.01 ke | 1.8360E+003 | |
| Boundary Limits: [ 1.834E+003, 1.838E+003] | | < : : : > |
| Peak FWHM Am-241 | 1.9962E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak FWHM Cs-137 | 2.2259E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Peak FWHM Co-60 | 2.7094E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Peak FWHM Y-88 | 2.8712E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Decay corrected activity | 1.5621E+005 | |
| Boundary Limits: [ 1.189E-001, 1.784E-001] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Decay corrected activity | 5.9948E+004 | |
| Boundary Limits: [ 4.862E-002, 7.293E-002] | | < : : : > |

Trend Test: The last 9 samples exhibit a bias trend.

Decay corrected activity 9.3867E+004
Boundary Limits: [ 7.700E-002, 1.155E-001] < : : : >
Trend Test: The last 9 samples exhibit a bias trend.

Decay corrected activity 1.9049E+005
Boundary Limits: [ 1.600E-001, 2.400E-001] < : : : >
Trend Test: The last 9 samples exhibit a bias trend.

| | | |
|---|---|---|
| Flags Key: | LU = Lower/Upper Bounds Test | (Ab = Above, Be = Below) |
| | SD = Sample Driven N-Sigma Test | (In = Investigate, Ac = Action) |
| | UD = User Driven N-Sigma Test | (In = Investigate, Ac = Action) |
| | BS = Measurement Bias Test | (In = Investigate, Ac = Action) |

**********
***** G E N I E Q U A L I T Y A S S U R A N C E *****
**********

C 8/22

Last Results Report
8/22/17 6:06:51 AM

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000004GAW-16C.QCK

Detector: GE4
Geometry: <None>
Certificate: GAW-16
Sample ID: QA Calibration C
Sample Desc: QA Count
Sample Quantity: 1.0000E+000
Sample Date: 10/1/16 12:00:00 PM
Measurement Date: 8/22/17 5:50:29 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 968.1 seconds

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| Peak centroid 59.54 kev | 5.8350E+001 | |
| Boundary Limits: [ 5.800E+001, 6.100E+001] | | < : : : > |
| Peak centroid 661.65 kev | 6.6065E+002 | |
| Boundary Limits: [ 6.600E+002, 6.630E+002] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak centroid 1332.49 ke | 1.3317E+003 | |
| Boundary Limits: [ 1.331E+003, 1.335E+003] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak centroid 1836.01 ke | 1.8355E+003 | |
| Boundary Limits: [ 1.834E+003, 1.838E+003] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |
| Peak FWHM Am-241 | 2.0721E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Peak FWHM Cs-137 | 2.5338E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Peak FWHM Co-60 | 2.6425E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | < : : : > |
| Peak FWHM Y-88 | 3.0089E+000 | |
| Boundary Limits: [ 5.000E-001, 3.000E+000] | | <Ab ocp : : : > |
| Decay corrected activity | 1.2611E+005 | |
| Boundary Limits: [ 1.196E-001, 1.793E-001] | | < : : : > |
| Decay corrected activity | 6.0979E+004 | |
| Boundary Limits: [ 4.890E-002, 7.335E-002] | | < : : : > |

Decay corrected activity 9.0711E+004
Boundary Limits: [ 7.743E-002, 1.161E-001] < : : : >
Trend Test: The last 9 samples exhibit a bias trend.

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| Decay corrected activity | 1.9318E+005 | |
| Boundary Limits: [ 1.609E-001, 2.414E-001] | | < : : : > |
| Trend Test: The last 9 samples exhibit a bias trend. | | |

Flags Key:
LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

8/22

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*****************************************************************************
*****          G E N I E   Q U A L I T Y   A S S U R A N C E          *****
*****************************************************************************
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Last Results Report
8/22/17 5:48:15 AM

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000001B.QCK

Detector: GE1
Geometry: <None>
Certificate: <None>
Sample ID: QA Background Ch
Sample Desc: QA Count
Sample Quantity: 1.0000E+000
Sample Date: 8/22/17 5:33:01 AM
Measurement Date: 8/22/17 5:33:03 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 900.1 seconds

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| DAILY BKG CT RATE GE1 [SD: 2.2765E+000+/- 1.245] | 2.2833E+000 | 5.5276E-003 < : : : > |

Flags Key:
LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

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*********************************************************************
*****          G E N I E   Q U A L I T Y   A S S U R A N C E      *****
*********************************************************************
```

Last Results Report
8/22/17 5:48:25 AM

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000002B.QCK

Detector: GE2
Geometry: <None>
Certificate: <None>
Sample ID: QA Background Ch
Sample Desc: QA Count
Sample Quantity: 1.0000E+000
Sample Date: 8/22/17 5:33:09 AM
Measurement Date: 8/22/17 5:33:10 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 900.1 seconds

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| DAILY BKG CT RATE GE2 [SD:-1.7100E+035+/-******] | 2.2422E+000 | 3.1702E-002 < : : : > |

Trend Test: The last 9 samples exhibit a bias trend.

Flags Key:
LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

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8/22

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*************************************************************************
*****        G E N I E   Q U A L I T Y   A S S U R A N C E          *****
*************************************************************************
```

Last Results Report
8/22/17 5:48:34 AM

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000003B.QCK

Detector: GE3
Geometry: <None>
Certificate: <None>
Sample ID: QA Background Ch
Sample Desc: QA Count
Sample Quantity: 1.0000E+000
Sample Date: 8/22/17 5:33:19 AM
Measurement Date: 8/22/17 5:33:20 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 901.7 seconds

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| DAILY BKG CT RATE GE3 [SD: 2.1800E+003+/-1174.9] | 1.6740E+003 | -4.3066E-001 < : : : > |

Trend Test: The last 9 samples exhibit a bias trend.

Flags Key:
LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Brov

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*************************************************************************
*****        G E N I E   Q U A L I T Y   A S S U R A N C E          *****
*************************************************************************
```

Last Results Report
8/22/17 5:48:43 AM

QA File: \\OR-GAMMA1\ApexRoot\Countroom\QA\D0000000004B.QCK

Detector: GE4
Geometry: <None>
Certificate: <None>
Sample ID: QA Background Ch
Sample Desc: QA Count
Sample Quantity: 1.0000E+000
Sample Date: 8/22/17 5:33:25 AM
Measurement Date: 8/22/17 5:33:27 AM
Elapsed Live Time: 900.0 seconds
Elapsed Real Time: 900.5 seconds

| Parameter Description [Mean +/- Std. Dev.] | Value | Deviation/Flags < LU : SD : UD : BS > |
|---|---|---|
| DAILY BKG CT RATE GE4 [SD: 7.1365E+000+/-131.19] | 1.5622E+000 | -4.2490E-002 < : : : > |

Trend Test: The last 9 samples exhibit a bias trend.

Flags Key:
LU = Lower/Upper Bounds Test (Ab = Above, Be = Below)
SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)
UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = Measurement Bias Test (In = Investigate, Ac = Action)