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\*\*\*\*\* G A M M A S P E C T R U M A N A L Y S I S \*\*\*\*\*  
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Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2120\W6H-IMC-212

Report Generated On : 4/19/2017 10:40:34 AM

Sample Title : W6H-IMC-2120-S-P-4

Sample Description :

Sample Identification : 2120-S-P-4

Sample Type :

Sample Geometry : cylinder

Peak Locate Threshold : 3.00

Peak Locate Range (in channels) : 40 - 8192

Peak Area Range (in channels) : 40 - 8192

Identification Energy Tolerance : 1.500 keV

Sample Size : 2.354E+002 grams

Sample Taken On : 3/17/2017 12:00:00 AM

Acquisition Started : 3/29/2017 10:38:50 AM

Live Time : 1800.0 seconds

Real Time : 1800.3 seconds

Dead Time : 0.02 %

Energy Calibration Used Done On : 3/24/2017

Efficiency Calibration Used Done On : 4/19/2017

Efficiency ID : H-IMC-2120-S-P-4

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\*\*\*\*\* P E A K A N A L Y S I S R E P O R T \*\*\*\*\*  
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Detector Name: 8566

Sample Title: W6H-IMC-2120-S-P-4

Peak Analysis Performed on: 4/19/2017 10:40:30 AM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

|   | Peak<br>No. | ROI<br>start | ROI<br>end | Peak<br>centroid | Energy<br>(keV) | FWHM<br>(keV) | Net Peak<br>Area | Net Area<br>Uncert. | Continuum<br>Counts |
|---|-------------|--------------|------------|------------------|-----------------|---------------|------------------|---------------------|---------------------|
| F | 1           | 178-         | 191        | 186.22           | 46.75           | 0.87          | 6.85E+001        | 20.23               | 5.13E+001           |
| M | 2           | 296-         | 314        | 299.99           | 75.21           | 0.73          | 8.64E+001        | 22.60               | 5.70E+001           |
| m | 3           | 296-         | 314        | 308.74           | 77.40           | 0.74          | 5.68E+001        | 19.35               | 6.33E+001           |
| F | 4           | 737-         | 752        | 742.31           | 185.86          | 0.83          | 4.79E+001        | 18.06               | 6.20E+001           |
| F | 5           | 946-         | 960        | 952.94           | 238.55          | 0.81          | 8.49E+001        | 20.95               | 4.88E+001           |
| F | 6           | 5826-        | 5850       | 5838.42          | 1460.63         | 2.36          | 1.54E+002        | 23.70               | 8.33E+000           |

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

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 \*\*\*\*\* N U C L I D E I D E N T I F I C A T I O N R E P O R T \*\*\*\*\*  
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Sample Title: W6H-IMC-2120-S-P-4  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 Full NLB.NL

..... IDENTIFIED NUCLIDES .....

| Nuclide<br>Name | Id<br>Confidence | Energy<br>(keV) | Yield<br>(%) | Activity<br>(pCi/gram) | Activity<br>Uncertainty |
|-----------------|------------------|-----------------|--------------|------------------------|-------------------------|
| K-40            | 0.997            | 1460.82*        | 10.66        | 1.07456E+001           | 1.88574E+000            |
| Pb-210          | 0.997            | 46.54*          | 4.25         | 2.82379E+000           | 1.15510E+000            |
| Pb-212          | 0.997            | 74.82*          | 10.28        | 7.65884E-001           | 2.52974E-001            |
|                 |                  | 77.11*          | 17.10        | 2.96884E-001           | 1.17402E-001            |
|                 |                  | 86.83           | 2.07         |                        |                         |
|                 |                  | 87.35           | 3.97         |                        |                         |
|                 |                  | 89.78           | 1.46         |                        |                         |
|                 |                  | 115.18          | 0.60         |                        |                         |
|                 |                  | 238.63*         | 43.60        | 2.49617E-001           | 7.31864E-002            |
|                 |                  | 300.09          | 3.30         |                        |                         |
| Ra-226          | 0.992            | 81.07           | 0.20         |                        |                         |
|                 |                  | 83.79           | 0.32         |                        |                         |
|                 |                  | 186.21*         | 3.64         | 1.36173E+000           | 5.62377E-001            |

\* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 1.500 keV

Nuclide confidence index threshold = 0.10

Errors quoted at 1.960 sigma

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 \*\*\*\*\* I N T E R F E R E N C E C O R R E C T E D R E P O R T \*\*\*\*\*  
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| Nuclide<br>Name | Nuclide<br>Id<br>Confidence | Wt mean<br>Activity<br>(pCi/gram) | Wt mean<br>Activity<br>Uncertainty |
|-----------------|-----------------------------|-----------------------------------|------------------------------------|
| K-40            | 0.997                       | 1.074559E+001                     | 1.885741E+000                      |
| Pb-210          | 0.997                       | 2.823786E+000                     | 1.155101E+000                      |
| Pb-212          | 0.997                       | 2.914417E-001                     | 6.031582E-002                      |
| Ra-226          | 0.992                       | 1.361733E+000                     | 5.623773E-001                      |

? = 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 1.960 sigma

\*\*\*\*\* U N I D E N T I F I E D P E A K S \*\*\*\*\*

Peak Locate Performed on: 4/19/2017 10:40:30 AM  
 Peak Locate From Channel: 40  
 Peak Locate To Channel: 8192

| Peak<br>No. | Energy<br>(keV) | Peak Size in<br>Counts per Second | Peak CPS<br>% Uncertainty | Peak<br>Type | Tol.<br>Nuclide |
|-------------|-----------------|-----------------------------------|---------------------------|--------------|-----------------|
|-------------|-----------------|-----------------------------------|---------------------------|--------------|-----------------|

All peaks were identified.

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\*\*\*\*\* N U C L I D E M D A R E P O R T \*\*\*\*\*  
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Detector Name: 8566  
Sample Geometry: cylinder  
Sample Title: W6H-IMC-2120-S-P-4  
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 Full NLB.NL

|   | Nuclide Name | Energy (keV) | Yield (%) | Line MDA (pCi/gram) | Nuclide MDA (pCi/gram) | Activity (pCi/gram) | Dec. Leve (pCi/gram) |
|---|--------------|--------------|-----------|---------------------|------------------------|---------------------|----------------------|
| + | K-40         | 1460.82*     | 10.66     | 1.210E+000          | 1.21E+000              | 1.075E+001          | 5.107E-00            |
|   | CO-60        | 1173.23      | 99.85     | 2.137E-001          | 2.08E-001              | 3.126E-002          | 9.849E-00            |
|   |              | 1332.49      | 99.98     | 2.080E-001          |                        | 6.689E-002          | 9.470E-00            |
|   | CS-137       | 661.66       | 85.10     | 1.584E-001          | 1.58E-001              | -4.201E-002         | 7.339E-00            |
| + | Pb-210       | 46.54*       | 4.25      | 1.885E+000          | 1.88E+000              | 2.824E+000          | 8.867E-00            |
|   | BI-212       | 288.20       | 0.34      | 2.042E+001          | 2.48E+000              | -1.882E+001         | 9.589E+00            |
|   |              | 328.03       | 0.13      | 6.579E+001          |                        | -3.741E+001         | 3.098E+00            |
|   |              | 452.98       | 0.36      | 3.048E+001          |                        | 8.661E+000          | 1.432E+00            |
|   |              | 727.33       | 6.67      | 2.479E+000          |                        | 5.695E-001          | 1.158E+00            |
|   |              | 785.37       | 1.10      | 1.439E+001          |                        | -4.513E+000         | 6.667E+00            |
|   |              | 893.41       | 0.38      | 4.800E+001          |                        | -3.746E+000         | 2.227E+00            |
|   |              | 952.12       | 0.17      | 1.052E+002          |                        | 4.102E+001          | 4.852E+00            |
|   |              | 1078.62      | 0.56      | 3.215E+001          |                        | -3.796E+000         | 1.471E+00            |
|   |              | 1512.70      | 0.29      | 5.920E+001          |                        | 8.205E+000          | 2.603E+00            |
|   |              | 1620.50      | 1.47      | 1.242E+001          |                        | 3.412E+000          | 5.461E+00            |
| + | Pb-212       | 74.82*       | 10.28     | 3.353E-001          | 1.22E-001              | 7.659E-001          | 1.557E-00            |
|   |              | 77.11*       | 17.10     | 2.076E-001          |                        | 2.969E-001          | 9.671E-00            |
|   |              | 86.83        | 2.07      | 2.434E+000          |                        | 2.033E-002          | 1.162E+00            |
|   |              | 87.35        | 3.97      | 1.238E+000          |                        | -3.596E-001         | 5.904E-00            |
|   |              | 89.78        | 1.46      | 3.211E+000          |                        | 0.000E+000          | 1.528E+00            |
|   |              | 115.18       | 0.60      | 5.968E+000          |                        | -1.005E+000         | 2.799E+00            |
|   |              | 238.63*      | 43.60     | 1.224E-001          |                        | 2.496E-001          | 5.724E-00            |
|   |              | 300.09       | 3.30      | 2.319E+000          |                        | -2.120E+000         | 1.094E+00            |
|   | BI-214       | 76.86        | 0.55      | 1.266E+001          | 3.34E-001              | 2.305E+001          | 6.105E+00            |
|   |              | 79.29        | 0.91      | 5.972E+000          |                        | 1.002E+000          | 2.855E+00            |
|   |              | 89.26        | 0.11      | 4.254E+001          |                        | 1.515E+001          | 2.025E+00            |
|   |              | 89.81        | 0.21      | 2.232E+001          |                        | 0.000E+000          | 1.062E+00            |
|   |              | 273.80       | 0.13      | 5.192E+001          |                        | -3.206E+000         | 2.441E+00            |
|   |              | 348.92       | 0.10      | 9.122E+001          |                        | 8.238E+001          | 4.316E+00            |
|   |              | 386.78       | 0.29      | 2.843E+001          |                        | -7.119E+000         | 1.325E+00            |
|   |              | 388.89       | 0.40      | 1.988E+001          |                        | -1.088E+001         | 9.229E+00            |
|   |              | 405.72       | 0.17      | 5.406E+001          |                        | -6.667E+000         | 2.526E+00            |
|   |              | 454.79       | 0.29      | 3.648E+001          |                        | -1.266E+001         | 1.708E+00            |
|   |              | 469.77       | 0.13      | 7.913E+001          |                        | -6.463E+001         | 3.692E+00            |
|   |              | 609.32       | 45.49     | 3.336E-001          |                        | 2.534E-001          | 1.568E-00            |
|   |              | 665.45       | 1.53      | 8.693E+000          |                        | -3.631E+000         | 4.022E+00            |
|   |              | 703.11       | 0.47      | 3.103E+001          |                        | -5.858E-002         | 1.441E+00            |
|   |              | 719.87       | 0.39      | 3.790E+001          |                        | -4.242E+001         | 1.758E+00            |
|   |              | 752.85       | 0.13      | 1.289E+002          |                        | 6.547E+001          | 6.006E+00            |
|   |              | 768.36       | 4.89      | 3.510E+000          |                        | 1.063E+000          | 1.638E+00            |
|   |              | 786.35       | 0.32      | 5.169E+001          |                        | 1.565E+001          | 2.403E+00            |
|   |              | 806.18       | 1.26      | 1.252E+001          |                        | -3.807E+000         | 5.787E+00            |

| Nuclide Name | Energy (keV) | Yield (%) | Line MDA (pCi/gram) | Nuclide MDA (pCi/gram) | Activity (pCi/gram) | Dec. Leve (pCi/gram) |
|--------------|--------------|-----------|---------------------|------------------------|---------------------|----------------------|
| BI-214       | 821.18       | 0.16      | 1.026E+002          | 3.34E-001              | -3.219E+001         | 4.755E+00            |
|              | 826.45       | 0.12      | 1.345E+002          |                        | -5.363E+001         | 6.206E+00            |
|              | 934.06       | 3.11      | 5.321E+000          |                        | -8.328E-001         | 2.442E+00            |
|              | 964.08       | 0.37      | 4.709E+001          |                        | 7.355E+000          | 2.163E+00            |
|              | 1051.96      | 0.31      | 5.864E+001          |                        | 1.138E+001          | 2.691E+00            |
|              | 1069.96      | 0.27      | 6.697E+001          |                        | 2.397E+001          | 3.067E+00            |
|              | 1120.29      | 14.92     | 1.532E+000          |                        | 7.142E-001          | 7.125E-00            |
|              | 1133.66      | 0.25      | 8.525E+001          |                        | -5.991E+001         | 3.942E+00            |
|              | 1155.21      | 1.63      | 1.192E+001          |                        | -7.790E+000         | 5.458E+00            |
|              | 1207.68      | 0.45      | 4.781E+001          |                        | 5.669E+000          | 2.202E+00            |
|              | 1238.11      | 5.83      | 3.776E+000          |                        | 3.768E+000          | 1.739E+00            |
|              | 1280.98      | 1.43      | 1.517E+001          |                        | 4.847E+000          | 6.960E+00            |
|              | 1303.75      | 0.11      | 1.631E+002          |                        | -1.884E+001         | 7.307E+00            |
|              | 1377.67      | 3.99      | 5.274E+000          |                        | 2.818E+000          | 2.398E+00            |
|              | 1385.31      | 0.79      | 2.361E+001          |                        | -3.374E+000         | 1.059E+00            |
|              | 1401.52      | 1.33      | 1.446E+001          |                        | -3.497E+000         | 6.503E+00            |
|              | 1407.99      | 2.39      | 9.071E+000          |                        | 7.151E+000          | 4.130E+00            |
|              | 1509.21      | 2.13      | 8.426E+000          |                        | 3.166E+000          | 3.728E+00            |
|              | 1538.53      | 0.40      | 3.251E+001          |                        | -4.877E+000         | 1.361E+00            |
|              | 1543.34      | 0.30      | 4.282E+001          |                        | -1.627E+001         | 1.793E+00            |
|              | 1583.20      | 0.70      | 2.536E+001          |                        | 3.013E+000          | 1.115E+00            |
|              | 1594.75      | 0.27      | 7.214E+001          |                        | -8.007E+000         | 3.201E+00            |
|              | 1599.37      | 0.32      | 6.085E+001          |                        | -2.370E+001         | 2.707E+00            |
|              | 1661.27      | 1.05      | 1.193E+001          |                        | -1.700E+001         | 4.890E+00            |
|              | 1684.01      | 0.21      | 7.409E+001          |                        | 3.326E+001          | 3.172E+00            |
|              | 1729.59      | 2.88      | 6.217E+000          |                        | -9.749E-001         | 2.703E+00            |
|              | 1764.49      | 15.30     | 1.466E+000          |                        | 9.600E-001          | 6.552E-00            |
|              | 1838.36      | 0.35      | 5.090E+001          |                        | 1.489E+001          | 2.191E+00            |
|              | 1847.43      | 2.03      | 8.229E+000          |                        | -3.290E+000         | 3.501E+00            |
|              | 1873.16      | 0.21      | 5.226E+001          |                        | 6.527E-001          | 2.025E+00            |
|              | 1896.05      | 0.15      | 1.147E+002          |                        | 4.521E+001          | 4.879E+00            |
|              | 2118.51      | 1.16      | 0.000E+000          |                        | 0.000E+000          | 0.000E+00            |
|              | 2204.06      | 4.92      | 0.000E+000          |                        | 0.000E+000          | 0.000E+00            |
|              | 2293.38      | 0.31      | 0.000E+000          |                        | 0.000E+000          | 0.000E+00            |
|              | 2447.70      | 1.55      | 0.000E+000          |                        | 0.000E+000          | 0.000E+00            |
| PB-214       | 74.82        | 5.80      | 1.155E+000          | 2.66E-001              | 2.970E-001          | 5.563E-00            |
|              | 77.11        | 9.70      | 7.095E-001          |                        | 4.616E-002          | 3.423E-00            |
|              | 86.83        | 1.70      | 2.964E+000          |                        | 2.475E-002          | 1.415E+00            |
|              | 87.35        | 2.24      | 2.194E+000          |                        | -6.372E-001         | 1.046E+00            |
|              | 89.78        | 0.82      | 5.717E+000          |                        | 0.000E+000          | 2.721E+00            |
|              | 241.99       | 7.25      | 1.256E+000          |                        | 2.844E-001          | 6.039E-00            |
|              | 258.76       | 0.53      | 1.241E+001          |                        | 4.045E+000          | 5.854E+00            |
|              | 274.80       | 0.35      | 1.825E+001          |                        | -5.800E+000         | 8.567E+00            |
|              | 295.22       | 18.42     | 4.307E-001          |                        | 4.294E-002          | 2.037E-00            |
|              | 351.93       | 35.60     | 2.665E-001          |                        | 1.761E-001          | 1.260E-00            |
|              | 462.02       | 0.21      | 5.267E+001          |                        | 2.092E+001          | 2.472E+00            |
|              | 480.43       | 0.34      | 3.592E+001          |                        | 1.116E+001          | 1.690E+00            |
|              | 487.14       | 0.43      | 2.458E+001          |                        | -5.425E+000         | 1.145E+00            |
|              | 533.66       | 0.18      | 6.301E+001          |                        | -1.355E+001         | 2.930E+00            |
|              | 580.14       | 0.37      | 3.927E+001          |                        | 4.676E+001          | 1.846E+00            |
|              | 785.96       | 1.06      | 1.560E+001          |                        | 6.202E+000          | 7.250E+00            |

|   | Nuclide Name | Energy (keV) | Yield (%) | Line MDA (pCi/gram) | Nuclide MDA (pCi/gram) | Activity (pCi/gram) | Dec. Leve (pCi/gram) |
|---|--------------|--------------|-----------|---------------------|------------------------|---------------------|----------------------|
| + | PB-214       | 839.07       | 0.58      | 2.575E+001          | 2.66E-001              | -1.276E+001         | 1.181E+00            |
|   | Ra-226       | 81.07        | 0.20      | 2.066E+001          | 1.35E+000              | -4.433E+000         | 9.729E+00            |
|   |              | 83.79        | 0.32      | 1.448E+001          |                        | 1.045E+001          | 6.881E+00            |
|   |              | 186.21*      | 3.64      | 1.351E+000          |                        | 1.362E+000          | 6.372E-00            |
|   | AC-228       | 89.96        | 1.90      | 1.053E+015          | 3.10E+014              | 0.000E+000          | 5.011E+01            |
|   |              | 93.35        | 3.10      | 6.433E+014          |                        | 1.020E+014          | 3.063E+01            |
|   |              | 99.51        | 1.26      | 1.292E+015          |                        | -5.515E+013         | 6.086E+01            |
|   |              | 104.82       | 0.39      | 4.139E+015          |                        | 1.095E+015          | 1.949E+01            |
|   |              | 105.60       | 0.74      | 2.123E+015          |                        | -7.334E+014         | 9.981E+01            |
|   |              | 108.58       | 0.28      | 5.708E+015          |                        | -2.517E+015         | 2.687E+01            |
|   |              | 129.07       | 2.42      | 6.982E+014          |                        | 3.762E+014          | 3.290E+01            |
|   |              | 145.85       | 0.16      | 1.215E+016          |                        | 3.168E+015          | 5.754E+01            |
|   |              | 153.98       | 0.72      | 2.484E+015          |                        | -3.636E+014         | 1.169E+01            |
|   |              | 191.35       | 0.12      | 1.701E+016          |                        | -1.193E+015         | 8.011E+01            |
|   |              | 199.41       | 0.31      | 7.295E+015          |                        | -7.594E+014         | 3.447E+01            |
|   |              | 204.03       | 0.11      | 1.958E+016          |                        | -1.540E+015         | 9.217E+01            |
|   |              | 209.25       | 3.89      | 6.267E+014          |                        | 3.030E+014          | 2.965E+01            |
|   |              | 214.85       | 0.76      | 3.082E+015          |                        | -2.127E+014         | 1.452E+01            |
|   |              | 270.24       | 3.46      | 8.404E+014          |                        | 7.496E+013          | 3.961E+01            |
|   |              | 278.95       | 0.16      | 1.681E+016          |                        | -6.813E+015         | 7.865E+01            |
|   |              | 321.65       | 0.23      | 1.489E+016          |                        | 3.755E+015          | 7.004E+01            |
|   |              | 327.44       | 0.12      | 2.996E+016          |                        | 8.459E+015          | 1.413E+01            |
|   |              | 328.00       | 2.95      | 1.190E+015          |                        | -6.767E+014         | 5.604E+01            |
|   |              | 332.37       | 0.40      | 8.851E+015          |                        | -3.915E+015         | 4.167E+01            |
|   |              | 338.32       | 11.27     | 3.096E+014          |                        | -1.381E+013         | 1.455E+01            |
|   |              | 340.96       | 0.37      | 9.479E+015          |                        | -6.379E+014         | 4.452E+01            |
|   |              | 409.46       | 1.92      | 1.907E+015          |                        | -1.329E+015         | 8.864E+01            |
|   |              | 440.44       | 0.12      | 3.587E+016          |                        | -1.616E+016         | 1.678E+01            |
|   |              | 463.00       | 4.40      | 1.073E+015          |                        | 1.294E+014          | 5.031E+01            |
|   |              | 478.33       | 0.21      | 2.488E+016          |                        | 1.606E+016          | 1.172E+01            |
|   |              | 503.82       | 0.18      | 2.482E+016          |                        | -4.229E+016         | 1.153E+01            |
|   |              | 508.96       | 0.45      | 1.444E+016          |                        | 1.545E+016          | 6.862E+01            |
|   |              | 523.13       | 0.10      | 4.702E+016          |                        | 8.765E+015          | 2.190E+01            |
|   |              | 546.47       | 0.20      | 2.423E+016          |                        | 2.882E+015          | 1.125E+01            |
|   |              | 562.50       | 0.87      | 6.387E+015          |                        | 1.676E+015          | 2.988E+01            |
|   |              | 570.91       | 0.18      | 2.974E+016          |                        | 2.034E+016          | 1.387E+01            |
|   |              | 572.14       | 0.15      | 3.374E+016          |                        | -2.046E+016         | 1.566E+01            |
|   |              | 583.41       | 0.11      | 5.461E+016          |                        | 4.214E+016          | 2.563E+01            |
|   |              | 674.75       | 2.10      | 3.042E+015          |                        | 5.997E+014          | 1.419E+01            |
|   |              | 701.75       | 0.17      | 3.488E+016          |                        | -1.669E+016         | 1.615E+01            |
|   |              | 707.41       | 0.16      | 4.156E+016          |                        | -3.325E+016         | 1.933E+01            |
|   |              | 726.86       | 0.62      | 1.161E+016          |                        | 6.329E+015          | 5.432E+01            |
|   |              | 755.32       | 1.00      | 7.012E+015          |                        | -2.388E+015         | 3.266E+01            |
|   |              | 772.29       | 1.49      | 4.945E+015          |                        | 4.148E+015          | 2.308E+01            |
|   |              | 782.14       | 0.49      | 1.414E+016          |                        | 5.114E+014          | 6.561E+01            |
|   |              | 794.95       | 4.25      | 1.730E+015          |                        | 2.058E+014          | 8.062E+01            |
|   |              | 830.49       | 0.54      | 1.250E+016          |                        | 4.140E+015          | 5.766E+01            |
|   |              | 835.71       | 1.61      | 3.922E+015          |                        | -7.672E+014         | 1.798E+01            |
|   |              | 840.38       | 0.91      | 7.204E+015          |                        | -1.502E+015         | 3.312E+01            |
|   |              | 904.20       | 0.77      | 1.105E+016          |                        | -1.698E+016         | 5.160E+01            |
|   |              | 911.20       | 25.80     | 3.631E+014          |                        | 2.117E+014          | 1.705E+01            |



| Nuclide Name | Energy (keV) | Yield (%) | Line MDA (pCi/gram) | Nuclide MDA (pCi/gram) | Activity (pCi/gram) | Dec. Leve (pCi/gram) |
|--------------|--------------|-----------|---------------------|------------------------|---------------------|----------------------|
| AC-228       | 947.98       | 0.11      | 7.311E+016          | 3.10E+014              | 3.850E+015          | 3.378E+01            |
|              | 958.61       | 0.28      | 2.373E+016          |                        | -1.840E+016         | 1.080E+01            |
|              | 964.77       | 4.99      | 1.456E+015          |                        | 3.323E+013          | 6.679E+01            |
|              | 968.97       | 15.80     | 4.513E+014          |                        | 7.900E+013          | 2.066E+01            |
|              | 1033.25      | 0.20      | 3.962E+016          |                        | 1.511E+016          | 1.823E+01            |
|              | 1065.18      | 0.13      | 5.801E+016          |                        | -1.336E+016         | 2.653E+01            |
|              | 1095.68      | 0.13      | 6.562E+016          |                        | -5.985E+014         | 3.022E+01            |
|              | 1110.61      | 0.28      | 3.236E+016          |                        | -9.483E+015         | 1.499E+01            |
|              | 1153.52      | 0.14      | 6.492E+016          |                        | 4.181E+015          | 2.995E+01            |
|              | 1247.08      | 0.50      | 1.734E+016          |                        | -1.381E+016         | 7.921E+01            |
|              | 1459.14      | 0.83      | 2.515E+016          |                        | 6.768E+016          | 1.206E+01            |
|              | 1495.91      | 0.86      | 8.643E+015          |                        | 2.945E+015          | 3.813E+01            |
|              | 1501.57      | 0.46      | 1.658E+016          |                        | -1.646E+015         | 7.337E+01            |
|              | 1557.11      | 0.18      | 3.667E+016          |                        | 2.823E+015          | 1.579E+01            |
|              | 1580.53      | 0.60      | 1.173E+016          |                        | 1.980E+015          | 5.098E+01            |
|              | 1588.20      | 3.22      | 2.490E+015          |                        | 2.942E+013          | 1.102E+01            |
|              | 1625.06      | 0.25      | 3.064E+016          |                        | 8.418E+015          | 1.347E+01            |
|              | 1630.63      | 1.51      | 4.930E+015          |                        | -8.608E+014         | 2.152E+01            |
|              | 1638.28      | 0.47      | 1.243E+016          |                        | -1.094E+016         | 5.207E+01            |
|              | 1666.52      | 0.18      | 3.005E+016          |                        | -2.001E+014         | 1.232E+01            |
| TH-230       | 67.67        | 0.38      | 1.380E+001          | 1.38E+001              | 5.248E+000          | 6.546E+00            |
| PA-234       | 742.81       | 0.11      | 1.448E+002          | 2.26E+001              | -4.920E+000         | 6.721E+00            |
|              | 766.42       | 0.32      | 5.405E+001          |                        | 1.637E+001          | 2.523E+00            |
| TH-234       | 1001.03      | 0.84      | 2.262E+001          | 1.59E+000              | 6.869E+000          | 1.045E+00            |
|              | 63.29        | 3.70      | 1.585E+000          |                        | 5.021E-001          | 7.534E-00            |
|              | 92.38        | 2.13      | 2.290E+000          |                        | 2.169E+000          | 1.092E+00            |
|              | 92.80        | 2.10      | 2.251E+000          |                        | 7.455E-001          | 1.072E+00            |
|              | 112.81       | 0.21      | 1.658E+001          |                        | -4.009E+000         | 7.764E+00            |
| U-234        | 53.20        | 0.12      | 4.943E+001          | 4.94E+001              | 2.602E+001          | 2.320E+00            |
|              | 120.90       | 0.04      | 1.069E+002          |                        | -4.596E+001         | 5.025E+00            |
| U-235        | 72.70        | 0.12      | 4.280E+001          | 4.02E-001              | -1.844E+001         | 2.035E+00            |
|              | 89.96        | 3.43      | 1.366E+000          |                        | 0.000E+000          | 6.501E-00            |
|              | 93.35        | 5.54      | 8.431E-001          |                        | 1.337E-001          | 4.015E-00            |
|              | 104.82       | 0.69      | 5.520E+000          |                        | 1.461E+000          | 2.600E+00            |
|              | 105.60       | 1.31      | 2.809E+000          |                        | -9.703E-001         | 1.321E+00            |
|              | 108.58       | 0.50      | 7.487E+000          |                        | -3.302E+000         | 3.524E+00            |
|              | 109.19       | 1.66      | 2.231E+000          |                        | -9.052E-001         | 1.050E+00            |
|              | 140.76       | 0.20      | 2.121E+001          |                        | -1.038E+001         | 1.002E+00            |
|              | 143.76       | 10.96     | 4.021E-001          |                        | -2.435E-001         | 1.902E-00            |
|              | 163.36       | 5.08      | 8.091E-001          |                        | 9.525E-002          | 3.794E-00            |
|              | 182.62       | 0.39      | 1.495E+001          |                        | -1.570E+000         | 7.123E+00            |
|              | 194.94       | 0.63      | 8.228E+000          |                        | 2.768E+000          | 3.883E+00            |
|              | 202.12       | 1.08      | 4.821E+000          |                        | -1.446E+000         | 2.272E+00            |
|              | 205.32       | 5.02      | 1.034E+000          |                        | -6.249E-001         | 4.870E-00            |
|              | 221.39       | 0.12      | 4.774E+001          |                        | 1.141E+001          | 2.250E+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

\*\*\*\*\*  
 \*\*\* LINE ACTIVITY CONSISTENCY EVALUATOR \*\*\*  
 \*\*\*\*\*

=====  
 Analysis using Key Line Activities  
 =====

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2120\W6H-IMC-212

Equation used to calculate plot:  $\ln(\text{Ratio}) = A + B \cdot \ln(\text{Energy})$   
 where: Ratio = Activity/KL Activity

Notes:

'^' Denotes Key Line energy

\* All uncertainties quoted at 1.96 sigma

| Nuclide | Energy<br>(keV) |   | Activity<br>(pCi/gram) | Activity<br>%Uncert* | Ratio[%Uncert] | A     | B<br>[uncert] |
|---------|-----------------|---|------------------------|----------------------|----------------|-------|---------------|
| -----   | -----           |   | -----                  | -----                | -----          | ----- | -----         |
| K-40    | 1460.8          | ^ | 1.07E+001              | 17.549               |                |       |               |
| Pb-210  | 46.5            | ^ | 2.82E+000              | 40.906               |                |       |               |
| Pb-212  | 74.8            |   | 7.66E-001              | 33.030               | 3.068[44.166]  | 3.40  | -0.623        |
|         | 77.1            |   | 2.97E-001              | 39.545               | 1.189[49.228]  |       | [ 0.461]      |
|         | 238.6           | ^ | 2.50E-001              | 29.319               | 1.000[41.464]  |       |               |
| Ra-226  | 186.2           | ^ | 1.36E+000              | 41.299               |                |       |               |