
***** G A M M A S P E C T R U M A N A L Y S I S *****

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2008\W6H-IMC-200

Report Generated On : 3/27/2017 1:48:39 PM

Sample Title : W6H-IMC-2008-S-P-7

Sample Description :

Sample Identification : 2008-S-P-7

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 : 1.000 keV

Sample Size : 2.879E+002 grams

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

Acquisition Started : 3/27/2017 12:51:52 PM

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 : 3/27/2017

Efficiency ID : H-IMC-2008-S-P-8

***** P E A K A N A L Y S I S R E P O R T *****

Detector Name: 8566

Sample Title: W6H-IMC-2008-S-P-7

Peak Analysis Performed on: 3/27/2017 1:48:35 PM

Peak Analysis From Channel: 40

Peak Analysis To Channel: 8192

	Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
M	1	296-	314	299.67	75.13	0.78	9.13E+001	25.67	9.75E+001
m	2	296-	314	308.38	77.31	0.78	7.41E+001	23.30	1.05E+002
F	3	735-	750	742.25	185.84	1.02	7.22E+001	20.93	6.00E+001
F	4	948-	960	953.06	238.58	1.12	1.07E+002	24.35	5.36E+001
F	5	1174-	1186	1179.38	295.19	0.93	2.84E+001	14.41	3.38E+001
F	6	1400-	1413	1406.13	351.91	1.01	5.81E+001	17.87	3.22E+001
F	7	5822-	5849	5836.62	1460.18	2.71	1.80E+002	25.06	1.24E+001

M = First peak in a multiplet region

m = Other peak in a multiplet region

F = Fitted singlet

Errors quoted at 1.960 sigma

 ***** 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 *****

Sample Title: W6H-IMC-2008-S-P-7
 Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 Full NLB.NL

..... IDENTIFIED NUCLIDES

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.937	1460.82*	10.66	1.10921E+001	1.80622E+000
Pb-212	0.996	74.82*	10.28	7.47634E-001	2.58798E-001
		77.11*	17.10	3.57112E-001	1.33346E-001
		86.83	2.07		
		87.35	3.97		
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	2.80408E-001	7.78183E-002
		300.09	3.30		
PB-214	0.854	74.82*	5.80	1.32512E+000	4.73773E-001
		77.11*	9.70	6.29547E-001	2.41811E-001
		86.83	1.70		
		87.35	2.24		
		89.78	0.82		
		241.99	7.25		
		258.76	0.53		
		274.80	0.35		
		295.22*	18.42	2.17024E-001	1.15405E-001
		351.93*	35.60	2.75913E-001	9.40917E-002
		462.02	0.21		
		480.43	0.34		
		487.14	0.43		
		533.66	0.18		
		580.14	0.37		
		785.96	1.06		
		839.07	0.58		
Ra-226	0.981	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	1.83557E+000	6.16253E-001

* = Energy line found in the spectrum.

@ = Energy line not used for Weighted Mean Activity

Energy Tolerance : 1.000 keV

Nuclide confidence index threshold = 0.10

Errors quoted at 1.960 sigma

 ***** 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 *****

Nuclide Name	Nuclide Id Confidence	Wt mean Activity (pCi/gram)	Wt mean Activity Uncertainty
K-40	0.937	1.109211E+001	1.806216E+000
Pb-212	0.996	2.848519E-001	6.585274E-002
PB-214	0.854	2.545483E-001	6.997354E-002
Ra-226	0.981	1.835573E+000	6.162528E-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: 3/27/2017 1:48:35 PM
 Peak Locate From Channel: 40
 Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
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All peaks were identified.

***** N U C L I D E M D A R E P O R T *****

Detector Name: 8566
Sample Geometry: cylinder
Sample Title: W6H-IMC-2008-S-P-7
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	1.306E+000	1.31E+000	1.109E+001	5.701E-00
	CO-60	1173.23	99.85	1.734E-001	1.63E-001	-3.685E-002	7.931E-00
		1332.49	99.98	1.634E-001		-1.212E-001	7.347E-00
	CS-137	661.66	85.10	1.543E-001	1.54E-001	2.123E-002	7.202E-00
	Pb-210	46.54	4.25	2.497E+000	2.50E+000	2.940E+000	1.194E+00
	BI-212	288.20	0.34	1.810E+001	2.06E+000	3.266E-001	8.496E+00
		328.03	0.13	5.639E+001		-1.132E+001	2.649E+00
		452.98	0.36	2.411E+001		-1.156E+001	1.123E+00
		727.33	6.67	2.061E+000		-9.042E-001	9.585E-00
		785.37	1.10	1.149E+001		-1.033E+001	5.276E+00
		893.41	0.38	3.961E+001		5.425E+000	1.827E+00
		952.12	0.17	9.045E+001		1.000E+001	4.162E+00
		1078.62	0.56	3.160E+001		2.408E+000	1.459E+00
		1512.70	0.29	5.100E+001		1.359E+001	2.235E+00
		1620.50	1.47	1.097E+001		6.867E+000	4.822E+00
+	Pb-212	74.82*	10.28	3.986E-001	1.10E-001	7.476E-001	1.882E-00
		77.11*	17.10	2.423E-001		3.571E-001	1.146E-00
		86.83	2.07	2.564E+000		4.842E-001	1.231E+00
		87.35	3.97	1.298E+000		3.874E-002	6.228E-00
		89.78	1.46	2.978E+000		-5.627E+000	1.419E+00
		115.18	0.60	6.196E+000		-1.013E+000	2.930E+00
		238.63*	43.60	1.095E-001		2.804E-001	5.122E-00
		300.09	3.30	2.139E+000		3.693E-001	1.011E+00
	BI-214	76.86	0.55	1.350E+001	3.16E-001	2.709E+001	6.544E+00
		79.29	0.91	6.134E+000		2.382E-001	2.946E+00
		89.26	0.11	4.057E+001		-9.356E+000	1.935E+00
		89.81	0.21	2.070E+001		-3.911E+001	9.862E+00
		273.80	0.13	5.074E+001		1.235E+001	2.399E+00
		348.92	0.10	9.250E+001		-4.434E+001	4.407E+00
		386.78	0.29	2.621E+001		-8.238E-001	1.225E+00
		388.89	0.40	2.011E+001		1.085E+001	9.423E+00
		405.72	0.17	4.811E+001		-1.047E+001	2.248E+00
		454.79	0.29	3.182E+001		1.240E+001	1.488E+00
		469.77	0.13	7.037E+001		-5.154E+001	3.284E+00
		609.32	45.49	3.158E-001		2.793E-001	1.490E-00
		665.45	1.53	9.037E+000		2.676E+000	4.231E+00
		703.11	0.47	2.616E+001		-9.307E+000	1.209E+00
		719.87	0.39	3.418E+001		-7.618E+000	1.588E+00
		752.85	0.13	1.118E+002		1.820E+001	5.202E+00
		768.36	4.89	2.911E+000		1.368E+000	1.352E+00
		786.35	0.32	4.003E+001		-1.704E+001	1.840E+00
		806.18	1.26	1.206E+001		-1.412E+000	5.613E+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	8.365E+001	3.16E-001	-5.814E+000	3.849E+00
	826.45	0.12	1.097E+002		-1.122E+002	5.023E+00
	934.06	3.11	5.729E+000		4.109E+000	2.670E+00
	964.08	0.37	5.158E+001		2.496E+001	2.409E+00
	1051.96	0.31	5.077E+001		-4.345E+000	2.325E+00
	1069.96	0.27	6.446E+001		-1.003E+001	2.973E+00
	1120.29	14.92	1.407E+000		-1.268E-001	6.562E-00
	1133.66	0.25	7.264E+001		-6.140E+001	3.348E+00
	1155.21	1.63	1.301E+001		5.661E+000	6.060E+00
	1207.68	0.45	4.395E+001		5.245E+000	2.030E+00
	1238.11	5.83	3.891E+000		2.784E+000	1.814E+00
	1280.98	1.43	1.250E+001		-3.878E+000	5.697E+00
	1303.75	0.11	1.884E+002		1.527E+002	8.666E+00
	1377.67	3.99	4.337E+000		5.814E-001	1.957E+00
	1385.31	0.79	2.291E+001		-1.881E+001	1.039E+00
	1401.52	1.33	1.510E+001		1.146E+001	6.906E+00
	1407.99	2.39	7.128E+000		-1.723E+000	3.205E+00
	1509.21	2.13	7.105E+000		9.848E-001	3.124E+00
	1538.53	0.40	3.243E+001		-5.743E+000	1.389E+00
	1543.34	0.30	3.601E+001		-2.534E+001	1.493E+00
	1583.20	0.70	2.726E+001		-6.485E+000	1.228E+00
	1594.75	0.27	7.008E+001		-1.473E+001	3.145E+00
	1599.37	0.32	4.917E+001		-3.773E+000	2.162E+00
	1661.27	1.05	1.367E+001		-8.418E-001	5.884E+00
	1684.01	0.21	6.541E+001		-7.645E+000	2.800E+00
	1729.59	2.88	4.985E+000		2.211E+000	2.134E+00
	1764.49	15.30	1.219E+000		5.100E-001	5.410E-00
	1838.36	0.35	4.341E+001		1.084E+001	1.858E+00
	1847.43	2.03	7.263E+000		-2.903E+000	3.090E+00
	1873.16	0.21	6.093E+001		1.594E+001	2.527E+00
	1896.05	0.15	1.222E+002		5.191E+001	5.354E+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	7.064E-001	1.50E-001	1.325E+000	3.336E-00
	77.11*	9.70	4.272E-001		6.295E-001	2.021E-00
	86.83	1.70	3.122E+000		5.896E-001	1.499E+00
	87.35	2.24	2.300E+000		6.866E-002	1.104E+00
	89.78	0.82	5.303E+000		-1.002E+001	2.526E+00
	241.99	7.25	1.184E+000		1.699E-001	5.703E-00
	258.76	0.53	1.108E+001		2.165E+000	5.223E+00
	274.80	0.35	1.828E+001		-7.353E+000	8.638E+00
	295.22*	18.42	2.427E-001		2.170E-001	1.110E-00
	351.93*	35.60	1.503E-001		2.759E-001	6.873E-00
	462.02	0.21	4.794E+001		2.649E+001	2.253E+00
	480.43	0.34	3.069E+001		2.903E-001	1.440E+00
	487.14	0.43	2.400E+001		-8.729E-001	1.125E+00
	533.66	0.18	5.600E+001		-1.204E+001	2.604E+00
	580.14	0.37	3.697E+001		3.847E+001	1.744E+00
	785.96	1.06	1.208E+001		-6.451E+000	5.553E+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	2.450E+001	1.50E-001	3.672E+000	1.131E+00
+	Ra-226	81.07	0.20	2.289E+001	1.19E+000	-5.299E+000	1.090E+00
		83.79	0.32	1.639E+001		1.481E+001	7.868E+00
		186.21*	3.64	1.191E+000		1.836E+000	5.612E-00
	PA-234	742.81	0.11	1.263E+002	1.83E+001	-1.115E+001	5.857E+00
		766.42	0.32	4.337E+001		-7.556E-001	2.009E+00
		1001.03	0.84	1.828E+001		-9.845E-001	8.380E+00
	TH-234	63.29	3.70	1.538E+000	1.54E+000	1.598E+000	7.323E-00
		92.38	2.13	2.216E+000		1.539E+000	1.060E+00
		92.80	2.10	2.225E+000		1.200E+000	1.064E+00
		112.81	0.21	1.706E+001		-2.284E+000	8.052E+00
	U-234	53.20	0.12	4.804E+001	4.80E+001	1.942E+000	2.259E+00
		120.90	0.04	1.008E+002		1.837E+001	4.753E+00
	U-235	72.70	0.12	5.082E+001	4.01E-001	-2.813E+001	2.443E+00
		89.96	3.43	1.267E+000		-2.393E+000	6.034E-00
		93.35	5.54	8.519E-001		7.457E-001	4.076E-00
		104.82	0.69	5.469E+000		-2.510E+000	2.589E+00
		105.60	1.31	2.921E+000		2.625E-001	1.385E+00
		108.58	0.50	7.287E+000		-3.756E+000	3.444E+00
		109.19	1.66	2.122E+000		-2.973E+000	1.001E+00
		140.76	0.20	2.222E+001		2.691E+000	1.058E+00
		143.76	10.96	4.006E-001		7.392E-002	1.905E-00
		163.36	5.08	8.210E-001		-2.084E-001	3.879E-00
		182.62	0.39	1.501E+001		-2.226E+000	7.189E+00
		194.94	0.63	7.918E+000		-6.688E+000	3.753E+00
		202.12	1.08	4.895E+000		-1.053E+000	2.323E+00
		205.32	5.02	1.001E+000		-1.469E+000	4.734E-00
		221.39	0.12	4.685E+001		2.038E+000	2.220E+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 ***

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 Analysis using Key Line Activities
 =====

Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2008\W6H-IMC-200

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 (keV)		Activity (pCi/gram)	Activity %Uncert*	Ratio[%Uncert]	A	B [uncert]
-----	-----		-----	-----	-----	-----	-----
K-40	1460.8	^	1.11E+001	16.284			
Pb-212	74.8		7.48E-001	34.616	2.666[44.367]	3.05	-0.559
	77.1		3.57E-001	37.340	1.274[46.524]		[0.443]
	238.6	^	2.80E-001	27.752	1.000[39.247]		
PB-214	74.8		1.33E+000	35.753	4.803[49.409]	5.00	-0.876
	77.1		6.30E-001	38.410	2.282[51.364]		[0.355]
	295.2		2.17E-001	53.176	0.787[63.171]		
	351.9	^	2.76E-001	34.102	1.000[48.227]		
Ra-226	186.2	^	1.84E+000	33.573			