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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-2008\W6H-IMC-200

Report Generated On : 3/27/2017 10:32:40 AM

Sample Title : W6H-IMC-2008-S-P-1
Sample Description :
Sample Identification : 2008-S-P-1
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 : 2.074E+002 grams

Sample Taken On : 3/17/2017 12:00:00 AM
Acquisition Started : 3/27/2017 9:02:57 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 : 3/27/2017
Efficiency ID : H-IMC-2008-S-P-1

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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-2008-S-P-1
Peak Analysis Performed on: 3/27/2017 10:32:37 AM
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
F	1	180-	192	186.65	46.86	0.75	5.75E+001	19.57	6.50E+001
M	2	295-	313	300.02	75.22	0.62	7.17E+001	22.54	7.77E+001
m	3	295-	313	308.37	77.31	0.63	4.62E+001	18.24	6.96E+001
F	4	738-	748	742.19	185.83	0.90	4.33E+001	18.95	5.64E+001
F	5	946-	959	953.10	238.59	0.77	6.17E+001	19.51	6.13E+001
F	6	1401-	1411	1405.98	351.87	1.04	2.80E+001	13.70	1.98E+001
F	7	5827-	5851	5838.91	1460.76	2.17	1.72E+002	25.63	1.39E+001

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-2008-S-P-1
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	0.999	1460.82*	10.66	1.37868E+001	2.36452E+000
Pb-210	0.984	46.54*	4.25	3.05371E+000	1.35081E+000
Pb-212	0.995	74.82*	10.28	7.77469E-001	2.90354E-001
		77.11*	17.10	2.94835E-001	1.30670E-001
		86.83	2.07		
		87.35	3.97		
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	2.12056E-001	7.50353E-002
		300.09	3.30		
PB-214	0.664	74.82*	5.80	1.37800E+000	5.29190E-001
		77.11*	9.70	5.19761E-001	2.35061E-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		
		351.93*	35.60	1.74015E-001	8.89434E-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	0.980	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	1.44567E+000	6.77845E-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

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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 Name	Nuclide Id Confidence	Wt mean Activity (pCi/gram)	Wt mean Activity Uncertainty
K-40	0.999	1.378685E+001	2.364516E+000
Pb-210	0.984	3.053706E+000	1.350811E+000
Pb-212	0.995	2.287144E-001	6.473003E-002
PB-214	0.664	1.872164E-001	8.369225E-002
Ra-226	0.980	1.445670E+000	6.778449E-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 10:32:37 AM
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

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-2008-S-P-1
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	1.735E+000	1.73E+000	1.379E+001	7.589E-00
	CO-60	1173.23	99.85	2.510E-001	1.78E-001	-8.539E-002	1.159E-00
		1332.49	99.98	1.778E-001		-1.720E-001	7.817E-00
	CS-137	661.66	85.10	2.043E-001	2.04E-001	4.264E-003	9.544E-00
+	Pb-210	46.54*	4.25	2.651E+000	2.65E+000	3.054E+000	1.254E+00
	BI-212	288.20	0.34	2.211E+001	2.69E+000	-3.689E+000	1.033E+00
		328.03	0.13	6.573E+001		-6.173E+001	3.064E+00
		452.98	0.36	3.524E+001		2.014E+001	1.655E+00
		727.33	6.67	2.690E+000		-1.180E+000	1.251E+00
		785.37	1.10	1.708E+001		-2.224E+000	7.927E+00
		893.41	0.38	5.265E+001		4.489E+001	2.432E+00
		952.12	0.17	1.180E+002		2.500E+001	5.428E+00
		1078.62	0.56	3.796E+001		-3.117E+001	1.740E+00
		1512.70	0.29	7.293E+001		1.855E+001	3.236E+00
		1620.50	1.47	1.561E+001		1.149E+001	6.945E+00
+	Pb-212	74.82*	10.28	4.741E-001	1.56E-001	7.775E-001	2.224E-00
		77.11*	17.10	2.650E-001		2.948E-001	1.239E-00
		86.83	2.07	2.918E+000		1.427E+000	1.392E+00
		87.35	3.97	1.498E+000		-3.454E-001	7.143E-00
		89.78	1.46	3.946E+000		-3.267E+000	1.880E+00
		115.18	0.60	6.709E+000		-2.668E+000	3.134E+00
		238.63*	43.60	1.562E-001		2.121E-001	7.343E-00
		300.09	3.30	2.866E+000		-2.788E+000	1.356E+00
	BI-214	76.86	0.55	1.557E+001	3.60E-001	-5.363E-001	7.515E+00
		79.29	0.91	7.254E+000		4.728E-001	3.467E+00
		89.26	0.11	5.121E+001		-1.830E+000	2.437E+00
		89.81	0.21	2.743E+001		-2.271E+001	1.307E+00
		273.80	0.13	6.427E+001		2.340E+001	3.032E+00
		348.92	0.10	1.039E+002		-3.925E+001	4.909E+00
		386.78	0.29	3.428E+001		-1.641E+001	1.602E+00
		388.89	0.40	2.564E+001		-1.835E+000	1.199E+00
		405.72	0.17	6.543E+001		1.324E+001	3.066E+00
		454.79	0.29	4.348E+001		6.204E+000	2.039E+00
		469.77	0.13	8.522E+001		3.028E+000	3.954E+00
		609.32	45.49	3.597E-001		-2.146E-003	1.682E-00
		665.45	1.53	1.134E+001		5.558E+000	5.292E+00
		703.11	0.47	3.595E+001		2.864E+001	1.669E+00
		719.87	0.39	4.426E+001		-1.521E+001	2.055E+00
		752.85	0.13	1.228E+002		-6.405E+000	5.633E+00
		768.36	4.89	3.706E+000		2.212E+000	1.718E+00
		786.35	0.32	5.982E+001		1.245E+001	2.781E+00
		806.18	1.26	1.609E+001		2.303E+000	7.501E+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	1.256E+002	3.60E-001	-1.471E+001	5.847E+00
		826.45	0.12	1.712E+002		3.563E+001	7.959E+00
		934.06	3.11	6.281E+000		8.821E-001	2.888E+00
		964.08	0.37	6.345E+001		-3.071E+000	2.951E+00
		1051.96	0.31	7.128E+001		2.343E+001	3.285E+00
		1069.96	0.27	7.640E+001		-3.473E+001	3.494E+00
		1120.29	14.92	1.821E+000		8.324E-001	8.489E-00
		1133.66	0.25	9.187E+001		-8.826E+001	4.223E+00
		1155.21	1.63	1.645E+001		-8.556E-001	7.644E+00
		1207.68	0.45	5.110E+001		-3.539E+001	2.337E+00
		1238.11	5.83	4.174E+000		8.336E-001	1.915E+00
		1280.98	1.43	1.748E+001		-1.862E+000	8.020E+00
		1303.75	0.11	2.188E+002		1.520E+002	9.960E+00
		1377.67	3.99	4.891E+000		5.993E-001	2.170E+00
		1385.31	0.79	2.623E+001		5.543E+000	1.172E+00
		1401.52	1.33	1.550E+001		2.719E+000	6.911E+00
		1407.99	2.39	8.301E+000		8.253E-001	3.683E+00
		1509.21	2.13	1.071E+001		7.240E+000	4.797E+00
		1538.53	0.40	4.072E+001		1.609E+001	1.732E+00
		1543.34	0.30	6.472E+001		1.626E+001	2.836E+00
		1583.20	0.70	2.845E+001		-1.278E+001	1.247E+00
		1594.75	0.27	7.159E+001		-2.994E+001	3.112E+00
		1599.37	0.32	6.084E+001		3.441E+001	2.656E+00
		1661.27	1.05	2.101E+001		4.386E+000	9.267E+00
		1684.01	0.21	9.382E+001		-2.852E+001	4.079E+00
		1729.59	2.88	6.009E+000		-2.846E+000	2.538E+00
		1764.49	15.30	1.654E+000		5.552E-001	7.375E-00
		1838.36	0.35	3.938E+001		-6.172E+001	1.562E+00
		1847.43	2.03	9.086E+000		3.312E+000	3.837E+00
		1873.16	0.21	9.415E+001		4.076E+001	4.031E+00
		1896.05	0.15	1.507E+002		1.090E+002	6.549E+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	8.403E-001	1.49E-001	1.378E+000	3.942E-00
		77.11*	9.70	4.672E-001		5.198E-001	2.184E-00
		86.83	1.70	3.553E+000		1.737E+000	1.696E+00
		87.35	2.24	2.654E+000		-6.122E-001	1.266E+00
		89.78	0.82	7.025E+000		-5.817E+000	3.347E+00
		241.99	7.25	1.432E+000		5.239E-002	6.877E-00
		258.76	0.53	1.375E+001		-3.996E+000	6.465E+00
		274.80	0.35	2.231E+001		4.598E+000	1.050E+00
		295.22	18.42	5.073E-001		3.017E-001	2.401E-00
		351.93*	35.60	1.488E-001		1.740E-001	6.597E-00
		462.02	0.21	5.863E+001		2.884E+001	2.744E+00
		480.43	0.34	3.445E+001		5.236E+000	1.599E+00
		487.14	0.43	2.726E+001		-5.705E+000	1.266E+00
		533.66	0.18	7.595E+001		3.242E+001	3.542E+00
		580.14	0.37	4.658E+001		3.568E+001	2.193E+00
		785.96	1.06	1.776E+001		-4.025E+000	8.247E+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	3.400E+001	1.49E-001	-1.197E+001	1.578E+00
+	Ra-226	81.07	0.20	2.729E+001	1.36E+000	2.516E+000	1.291E+00
		83.79	0.32	1.709E+001		-3.798E+000	8.111E+00
		186.21*	3.64	1.360E+000		1.446E+000	6.350E-00
	U-234	53.20	0.12	6.208E+001	6.21E+001	1.016E+001	2.912E+00
		120.90	0.04	1.235E+002		1.191E+001	5.794E+00
	U-235	72.70	0.12	5.939E+001	4.75E-001	4.303E+001	2.840E+00
		89.96	3.43	1.678E+000		-1.390E+000	7.996E-00
		93.35	5.54	9.678E-001		3.041E-001	4.597E-00
		104.82	0.69	6.606E+000		1.205E+000	3.111E+00
		105.60	1.31	3.453E+000		3.458E-001	1.626E+00
		108.58	0.50	9.041E+000		-5.820E-001	4.258E+00
		109.19	1.66	2.752E+000		-5.844E-002	1.297E+00
		140.76	0.20	2.460E+001		-2.398E+001	1.160E+00
		143.76	10.96	4.752E-001		-5.093E-002	2.248E-00
		163.36	5.08	1.042E+000		3.941E-001	4.911E-00
		182.62	0.39	1.864E+001		-1.356E+001	8.902E+00
		194.94	0.63	9.317E+000		-1.050E+000	4.388E+00
		202.12	1.08	5.827E+000		2.506E+000	2.751E+00
		205.32	5.02	1.288E+000		-6.084E-001	6.088E-00
		221.39	0.12	5.324E+001		1.989E+001	2.502E+00
	U-238	63.29	3.70	1.888E+000	1.30E+000	1.027E+000	8.952E-00
		92.60	4.23	1.300E+000		5.402E-001	6.182E-00
		766.42	0.32	5.510E+001		1.259E+001	2.549E+00
		1001.03	0.84	2.488E+001		-3.576E+000	1.145E+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

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**** L I N E A C T I V I T Y C O N S I S T E N C Y E V A L U A T O R ***
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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(Ratio) = A + B*ln(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	^	1.38E+001	17.151			
Pb-210	46.5	^	3.05E+000	44.235			
Pb-212	74.8		7.77E-001	37.346	3.666[51.447]	4.18	-0.766
	77.1		2.95E-001	44.320	1.390[56.712]		[0.549]
	238.6	^	2.12E-001	35.385	1.000[50.041]		
PB-214	74.8		1.38E+000	38.403	7.919[63.932]	6.22	-1.062
	77.1		5.20E-001	45.225	2.987[68.248]		[0.561]
	351.9	^	1.74E-001	51.112	1.000[72.284]		
Ra-226	186.2	^	1.45E+000	46.888			