
***** 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-2079\W6H-IMC-207

Report Generated On : 5/1/2017 10:00:18 AM

Sample Title : W6H-IMC-2079-S-P-7
Sample Description :
Sample Identification : 2079-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 : 2.412E+002 grams

Sample Taken On : 3/17/2017 12:00:00 AM
Acquisition Started : 3/31/2017 1:28:34 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 : 5/1/2017
Efficiency ID : H-IMC-2079-S-P-7

***** 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-2079-S-P-7

Peak Analysis Performed on: 5/1/2017 10:00:14 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
M	1	295-	314	299.42	75.07	0.78	7.18E+001	22.80	7.30E+001
m	2	295-	314	309.03	77.47	0.79	3.04E+001	16.45	6.16E+001
F	3	736-	746	741.42	185.64	0.80	4.91E+001	17.47	3.71E+001
F	4	947-	959	953.22	238.61	0.94	7.19E+001	20.45	4.55E+001
F	5	5826-	5848	5837.68	1460.45	2.11	1.39E+002	63.19	7.67E+000

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-2079-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	0.978	1460.82*	10.66	9.48096E+000	4.37414E+000
Pb-212	0.994	74.82*	10.28	6.28899E-001	2.36548E-001
		77.11*	17.10	1.56325E-001	9.03607E-002
		86.83	2.07		
		87.35	3.97		
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	2.07208E-001	6.74597E-002
		300.09	3.30		
Ra-226	0.955	81.07	0.20		
		83.79	0.32		
		186.21*	3.64	1.36555E+000	5.38433E-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	0.978	9.480959E+000	4.374140E+000
Pb-212	0.994	2.108303E-001	5.269832E-002
Ra-226	0.955	1.365554E+000	5.384327E-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: 5/1/2017 10:00:14 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
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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-2079-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	1.119E+000	1.12E+000	9.481E+000	4.677E-00
	CO-60	1173.23	99.85	2.008E-001	2.01E-001	6.423E-003	9.222E-00
		1332.49	99.98	2.088E-001		5.462E-002	9.530E-00
	CS-137	661.66	85.10	1.483E-001	1.48E-001	2.251E-002	6.844E-00
	Pb-210	46.54	4.25	2.088E+000	2.09E+000	1.416E+000	9.878E-00
	BI-212	288.20	0.34	2.069E+001	2.20E+000	2.020E+000	9.738E+00
		328.03	0.13	6.202E+001		4.564E+001	2.914E+00
		452.98	0.36	2.769E+001		4.465E-001	1.294E+00
		727.33	6.67	2.202E+000		1.027E+000	1.021E+00
		785.37	1.10	1.524E+001		9.133E+000	7.103E+00
		893.41	0.38	3.881E+001		-2.745E+001	1.771E+00
		952.12	0.17	9.356E+001		3.498E+000	4.279E+00
		1078.62	0.56	2.749E+001		-1.714E+001	1.241E+00
		1512.70	0.29	4.678E+001		-2.923E+001	1.990E+00
		1620.50	1.47	1.054E+001		-3.637E+000	4.538E+00
+	Pb-212	74.82*	10.28	3.719E-001	1.11E-001	6.289E-001	1.741E-00
		77.11*	17.10	2.020E-001		1.563E-001	9.402E-00
		86.83	2.07	2.306E+000		8.011E-001	1.099E+00
		87.35	3.97	1.187E+000		2.084E-001	5.653E-00
		89.78	1.46	2.801E+000		-6.200E+000	1.325E+00
		115.18	0.60	6.007E+000		-2.515E+000	2.821E+00
		238.63*	43.60	1.114E-001		2.072E-001	5.181E-00
		300.09	3.30	2.178E+000		-1.122E+000	1.024E+00
	BI-214	76.86	0.55	1.160E+001	3.10E-001	1.792E+001	5.580E+00
		79.29	0.91	5.095E+000		1.595E-002	2.418E+00
		89.26	0.11	3.843E+001		-2.500E+001	1.821E+00
		89.81	0.21	1.947E+001		-4.310E+001	9.209E+00
		273.80	0.13	4.885E+001		1.335E+001	2.290E+00
		348.92	0.10	8.524E+001		8.160E+001	4.022E+00
		386.78	0.29	3.318E+001		1.583E+001	1.565E+00
		388.89	0.40	2.436E+001		1.498E+001	1.149E+00
		405.72	0.17	5.676E+001		1.754E+001	2.665E+00
		454.79	0.29	3.410E+001		-3.825E+001	1.592E+00
		469.77	0.13	8.430E+001		3.348E+001	3.956E+00
		609.32	45.49	3.095E-001		1.014E-001	1.450E-00
		665.45	1.53	8.660E+000		4.795E+000	4.012E+00
		703.11	0.47	3.252E+001		2.603E+001	1.517E+00
		719.87	0.39	3.284E+001		-2.472E+000	1.508E+00
		752.85	0.13	1.165E+002		9.476E+000	5.400E+00
		768.36	4.89	3.411E+000		3.609E-002	1.591E+00
		786.35	0.32	5.368E+001		4.023E+001	2.506E+00
		806.18	1.26	1.168E+001		6.989E+000	5.379E+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	9.420E+001	3.10E-001	8.944E+000	4.342E+00
	826.45	0.12	1.183E+002		-3.526E+001	5.404E+00
	934.06	3.11	5.149E+000		-2.218E+000	2.360E+00
	964.08	0.37	5.333E+001		4.369E+001	2.479E+00
	1051.96	0.31	5.414E+001		-5.980E+001	2.471E+00
	1069.96	0.27	7.192E+001		3.453E+001	3.320E+00
	1120.29	14.92	1.475E+000		3.143E-002	6.853E-00
	1133.66	0.25	8.563E+001		8.108E+001	3.968E+00
	1155.21	1.63	1.139E+001		1.338E+000	5.203E+00
	1207.68	0.45	4.629E+001		-6.227E+000	2.130E+00
	1238.11	5.83	3.730E+000		1.246E+000	1.719E+00
	1280.98	1.43	1.547E+001		3.386E+000	7.124E+00
	1303.75	0.11	1.706E+002		-1.536E+001	7.697E+00
	1377.67	3.99	4.240E+000		5.762E-002	1.886E+00
	1385.31	0.79	2.309E+001		-3.300E+000	1.036E+00
	1401.52	1.33	1.341E+001		2.835E+000	5.996E+00
	1407.99	2.39	7.342E+000		1.956E-001	3.274E+00
	1509.21	2.13	6.104E+000		8.956E-001	2.578E+00
	1538.53	0.40	2.864E+001		-8.584E+000	1.174E+00
	1543.34	0.30	3.294E+001		2.931E+000	1.307E+00
	1583.20	0.70	2.710E+001		3.130E+000	1.205E+00
	1594.75	0.27	7.487E+001		3.572E+001	3.346E+00
	1599.37	0.32	6.069E+001		1.752E+001	2.706E+00
	1661.27	1.05	1.701E+001		7.691E+000	7.452E+00
	1684.01	0.21	7.976E+001		5.773E+001	3.467E+00
	1729.59	2.88	4.888E+000		4.986E-001	2.047E+00
	1764.49	15.30	1.165E+000		4.328E-001	5.064E-00
	1838.36	0.35	5.592E+001		6.131E+000	2.450E+00
	1847.43	2.03	8.642E+000		9.094E-001	3.721E+00
	1873.16	0.21	6.750E+001		3.403E+001	2.799E+00
	1896.05	0.15	1.077E+002		-3.339E+001	4.549E+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	1.131E+000	2.45E-001	3.579E-001	5.443E-00
	77.11	9.70	6.417E-001		-9.108E-003	3.085E-00
	86.83	1.70	2.807E+000		9.755E-001	1.338E+00
	87.35	2.24	2.104E+000		3.693E-001	1.002E+00
	89.78	0.82	4.987E+000		-1.104E+001	2.359E+00
	241.99	7.25	1.180E+000		-3.249E-001	5.660E-00
	258.76	0.53	1.166E+001		5.090E+000	5.486E+00
	274.80	0.35	1.690E+001		-4.304E+000	7.903E+00
	295.22	18.42	4.201E-001		8.920E-002	1.987E-00
	351.93	35.60	2.450E-001		6.798E-002	1.154E-00
	462.02	0.21	5.097E+001		2.146E+000	2.390E+00
	480.43	0.34	2.926E+001		-6.393E-002	1.359E+00
	487.14	0.43	2.101E+001		-2.333E+001	9.684E+00
	533.66	0.18	5.773E+001		1.752E+001	2.671E+00
	580.14	0.37	3.888E+001		2.840E+001	1.829E+00
	785.96	1.06	1.608E+001		1.463E+001	7.504E+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	2.948E+001	2.45E-001	3.341E+000	1.370E+00
	Ra-226	81.07	0.20	1.856E+001	9.35E-001	-9.616E+000	8.688E+00
		83.79	0.32	1.349E+001		7.475E+000	6.391E+00
		186.21*	3.64	9.352E-001		1.366E+000	4.299E-00
	AC-228	89.96	1.90	2.825E+017	9.79E+016	-6.252E+017	1.336E+01
		93.35	3.10	1.849E+017		6.691E+016	8.781E+01
		99.51	1.26	3.764E+017		8.485E+016	1.769E+01
		104.82	0.39	1.298E+018		4.478E+015	6.125E+01
		105.60	0.74	6.939E+017		2.620E+017	3.278E+01
		108.58	0.28	1.745E+018		-2.559E+017	8.219E+01
		129.07	2.42	2.020E+017		-1.741E+017	9.494E+01
		145.85	0.16	3.469E+018		3.159E+017	1.637E+01
		153.98	0.72	6.861E+017		-2.013E+017	3.210E+01
		191.35	0.12	5.426E+018		-2.768E+017	2.563E+01
		199.41	0.31	1.969E+018		-2.140E+018	9.242E+01
		204.03	0.11	6.367E+018		1.922E+018	3.010E+01
		209.25	3.89	1.728E+017		-1.677E+017	8.131E+01
		214.85	0.76	9.671E+017		9.375E+016	4.568E+01
		270.24	3.46	2.356E+017		-1.307E+017	1.105E+01
		278.95	0.16	4.967E+018		-1.225E+018	2.321E+01
		321.65	0.23	4.284E+018		6.889E+017	2.009E+01
		327.44	0.12	8.419E+018		7.365E+018	3.954E+01
		328.00	2.95	3.451E+017		2.539E+017	1.621E+01
		332.37	0.40	2.428E+018		-1.899E+018	1.136E+01
		338.32	11.27	1.029E+017		4.266E+016	4.865E+01
		340.96	0.37	3.170E+018		1.538E+018	1.498E+01
		409.46	1.92	6.181E+017		-6.591E+017	2.888E+01
		440.44	0.12	9.691E+018		-3.714E+018	4.499E+01
		463.00	4.40	3.212E+017		6.186E+015	1.506E+01
		478.33	0.21	6.456E+018		1.509E+018	3.009E+01
		503.82	0.18	8.322E+018		-9.799E+018	3.896E+01
		508.96	0.45	4.316E+018		2.577E+018	2.050E+01
		523.13	0.10	1.362E+019		4.530E+018	6.323E+01
		546.47	0.20	7.759E+018		-2.653E+018	3.618E+01
		562.50	0.87	1.898E+018		4.131E+017	8.870E+01
		570.91	0.18	8.630E+018		-8.352E+017	4.013E+01
		572.14	0.15	1.041E+019		-2.302E+018	4.839E+01
		583.41	0.11	1.693E+019		1.960E+018	7.958E+01
		674.75	2.10	7.724E+017		1.838E+017	3.554E+01
		701.75	0.17	1.104E+019		-2.338E+018	5.130E+01
		707.41	0.16	1.251E+019		5.812E+018	5.819E+01
		726.86	0.62	3.108E+018		1.450E+018	1.442E+01
		755.32	1.00	1.998E+018		8.483E+017	9.271E+01
		772.29	1.49	1.446E+018		-6.256E+017	6.738E+01
		782.14	0.49	4.627E+018		1.815E+018	2.160E+01
		794.95	4.25	4.412E+017		-2.835E+017	2.028E+01
		830.49	0.54	4.041E+018		1.461E+017	1.875E+01
		835.71	1.61	1.385E+018		9.159E+017	6.436E+01
		840.38	0.91	2.522E+018		1.117E+018	1.174E+01
		904.20	0.77	3.257E+018		1.695E+018	1.518E+01
		911.20	25.80	9.787E+016		2.206E+016	4.562E+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	2.074E+019	9.79E+016	-2.549E+018	9.536E+01
	958.61	0.28	8.334E+018		1.019E+018	3.847E+01
	964.77	4.99	5.245E+017		5.516E+017	2.442E+01
	968.97	15.80	1.612E+017		-1.849E+015	7.489E+01
	1033.25	0.20	1.035E+019		-9.688E+018	4.697E+01
	1065.18	0.13	2.028E+019		1.401E+019	9.395E+01
	1095.68	0.13	1.742E+019		-8.572E+018	7.931E+01
	1110.61	0.28	8.951E+018		-4.223E+018	4.118E+01
	1153.52	0.14	1.734E+019		-6.289E+017	7.911E+01
	1247.08	0.50	5.637E+018		9.348E+017	2.593E+01
	1459.14	0.83	7.224E+018		1.713E+019	3.457E+01
	1495.91	0.86	2.344E+018		1.275E+018	1.019E+01
	1501.57	0.46	3.535E+018		-2.039E+018	1.481E+01
	1557.11	0.18	1.173E+019		4.151E+018	5.101E+01
	1580.53	0.60	3.316E+018		-3.659E+018	1.428E+01
	1588.20	3.22	7.653E+017		-2.106E+017	3.396E+01
	1625.06	0.25	8.988E+018		3.741E+018	3.938E+01
	1630.63	1.51	1.599E+018		-5.023E+016	7.053E+01
	1638.28	0.47	5.615E+018		1.621E+018	2.504E+01
	1666.52	0.18	1.092E+019		-1.047E+019	4.643E+01
TH-230	67.67	0.38	1.163E+001	1.16E+001	-9.076E-001	5.463E+00
PA-234	742.81	0.11	1.283E+002	2.25E+001	-3.237E+001	5.909E+00
	766.42	0.32	5.363E+001		4.697E+001	2.506E+00
TH-234	1001.03	0.84	2.253E+001	1.38E+000	-3.108E+000	1.043E+00
	63.29	3.70	1.377E+000		-8.168E-001	6.499E-00
	92.38	2.13	2.118E+000		1.583E+000	1.008E+00
	92.80	2.10	2.122E+000		1.487E+000	1.009E+00
	112.81	0.21	1.710E+001		-2.352E+000	8.034E+00
U-234	53.20	0.12	4.420E+001	4.42E+001	-1.292E+000	2.060E+00
	120.90	0.04	1.102E+002		1.563E+001	5.195E+00
U-235	72.70	0.12	4.707E+001	3.80E-001	3.039E+001	2.249E+00
	89.96	3.43	1.192E+000		-2.637E+000	5.635E-00
	93.35	5.54	7.879E-001		2.851E-001	3.742E-00
	104.82	0.69	5.626E+000		1.942E-002	2.656E+00
	105.60	1.31	2.985E+000		1.127E+000	1.410E+00
	108.58	0.50	7.442E+000		-1.091E+000	3.505E+00
	109.19	1.66	2.254E+000		2.726E-001	1.062E+00
	140.76	0.20	1.990E+001		-1.537E+001	9.372E+00
	143.76	10.96	3.801E-001		2.145E-001	1.794E-00
	163.36	5.08	7.743E-001		1.915E-001	3.625E-00
	182.62	0.39	1.457E+001		6.254E+000	6.936E+00
	194.94	0.63	7.318E+000		-2.715E+000	3.433E+00
	202.12	1.08	4.989E+000		7.780E-001	2.359E+00
	205.32	5.02	1.077E+000		8.398E-001	5.091E-00
	221.39	0.12	4.327E+001		-2.075E+001	2.029E+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-2079\W6H-IMC-207

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	^	9.48E+000	46.136			
Pb-212	74.8		6.29E-001	37.613	3.035[49.746]	2.98	-0.547
	77.1		1.56E-001	57.803	0.754[66.341]		[0.530]
	238.6	^	2.07E-001	32.557	1.000[46.042]		
Ra-226	186.2	^	1.37E+000	39.430			