
***** 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 9:49:07 AM

Sample Title : W6H-IMC-2079-S-P-3

Sample Description :

Sample Identification : 2079-S-P-3

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 : 2.805E+002 grams

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

Acquisition Started : 3/31/2017 9:48:53 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 : 5/1/2017

Efficiency ID : H-IMC-2079-S-P-3

***** 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-3

Peak Analysis Performed on: 5/1/2017 9:49:04 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	179-	193	186.51	46.83	1.01	5.67E+001	19.35	5.25E+001
M	2	294-	316	300.24	75.27	0.74	6.25E+001	21.01	7.71E+001
m	3	294-	316	308.65	77.38	0.74	6.16E+001	19.47	5.46E+001
F	4	949-	959	953.49	238.68	0.93	5.41E+001	18.29	3.71E+001
F	5	1400-	1411	1405.54	351.76	0.85	3.38E+001	14.49	2.76E+001
F	6	5825-	5849	5837.06	1460.29	2.32	1.49E+002	23.89	1.39E+001
F	7	7047-	7062	7055.16	1764.99	0.62	9.37E+000	2.56	1.60E+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-3
 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	0.956	1460.82*	10.66	9.38538E+000	1.70533E+000
Pb-210	0.987	46.54*	4.25	2.29959E+000	1.01913E+000
Pb-212	0.993	74.82*	10.28	5.24238E-001	2.05571E-001
		77.11*	17.10	3.04306E-001	1.14070E-001
		86.83	2.07		
		87.35	3.97		
		89.78	1.46		
		115.18	0.60		
		238.63*	43.60	1.45676E-001	5.44224E-002
		300.09	3.30		
PB-214	0.662	74.82*	5.80	9.29167E-001	3.73721E-001
		77.11*	9.70	5.36458E-001	2.06810E-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	1.64731E-001	7.46755E-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		

* = 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	0.956	9.385375E+000	1.705327E+000
Pb-210	0.987	2.299593E+000	1.019135E+000
Pb-212	0.993	1.694441E-001	4.849907E-002
PB-214	0.662	1.901047E-001	6.992667E-002

? = 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 9:49:04 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
F 7	1764.99	5.2083E-003	27.31	Tol.	BI-214

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 M D A R E P O R T *****

Detector Name: 8566
Sample Geometry: cylinder
Sample Title: W6H-IMC-2079-S-P-3
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	1.366E+000	1.37E+000	9.385E+000	5.976E-00
	CO-60	1173.23	99.85	1.941E-001	1.53E-001	4.979E-002	8.948E-00
		1332.49	99.98	1.532E-001		-6.559E-002	6.816E-00
	CS-137	661.66	85.10	1.406E-001	1.41E-001	-1.419E-001	6.498E-00
+	Pb-210	46.54*	4.25	1.919E+000	1.92E+000	2.300E+000	9.047E-00
	BI-212	288.20	0.34	2.033E+001	2.08E+000	8.841E+000	9.600E+00
		328.03	0.13	5.787E+001		-7.098E+000	2.719E+00
		452.98	0.36	2.667E+001		2.273E+001	1.249E+00
		727.33	6.67	2.082E+000		-2.729E-001	9.671E-00
		785.37	1.10	1.240E+001		-3.651E+000	5.721E+00
		893.41	0.38	3.517E+001		-1.870E+001	1.601E+00
		952.12	0.17	8.166E+001		-2.925E+001	3.713E+00
		1078.62	0.56	3.021E+001		-6.896E-001	1.386E+00
		1512.70	0.29	5.622E+001		-5.579E+000	2.488E+00
		1620.50	1.47	1.009E+001		3.064E+000	4.365E+00
+	Pb-212	74.82*	10.28	3.655E-001	9.05E-002	5.242E-001	1.714E-00
		77.11*	17.10	1.833E-001		3.043E-001	8.495E-00
		86.83	2.07	2.259E+000		9.362E-001	1.078E+00
		87.35	3.97	1.124E+000		-6.757E-001	5.352E-00
		89.78	1.46	2.823E+000		-2.966E+000	1.339E+00
		115.18	0.60	5.709E+000		4.096E+000	2.682E+00
		238.63*	43.60	9.052E-002		1.457E-001	4.162E-00
		300.09	3.30	2.100E+000		-2.653E+000	9.894E-00
	BI-214	76.86	0.55	1.182E+001	2.84E-001	2.122E+001	5.697E+00
		79.29	0.91	5.573E+000		9.164E-002	2.663E+00
		89.26	0.11	3.801E+001		0.000E+000	1.804E+00
		89.81	0.21	1.963E+001		-2.062E+001	9.310E+00
		273.80	0.13	4.934E+001		2.389E+001	2.325E+00
		348.92	0.10	8.668E+001		-1.076E+001	4.110E+00
		386.78	0.29	2.779E+001		1.444E+001	1.301E+00
		388.89	0.40	1.944E+001		-7.391E+000	9.071E+00
		405.72	0.17	4.251E+001		3.820E+000	1.964E+00
		454.79	0.29	3.222E+001		-2.143E+000	1.506E+00
		469.77	0.13	7.473E+001		-1.337E+000	3.495E+00
		609.32	45.49	2.845E-001		1.062E-001	1.331E-00
		665.45	1.53	8.785E+000		-4.681E-001	4.097E+00
		703.11	0.47	2.481E+001		-1.803E+001	1.140E+00
		719.87	0.39	3.394E+001		-8.278E+000	1.572E+00
		752.85	0.13	1.130E+002		-4.071E+001	5.250E+00
		768.36	4.89	2.737E+000		-1.947E+000	1.262E+00
		786.35	0.32	4.235E+001		-3.164E+001	1.952E+00
		806.18	1.26	1.097E+001		-2.423E+000	5.056E+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	8.672E+001	2.84E-001	-1.266E+001	3.994E+00
	826.45	0.12	1.200E+002		-3.028E+001	5.528E+00
	934.06	3.11	5.095E+000		2.293E+000	2.348E+00
	964.08	0.37	5.610E+001		6.822E+001	2.631E+00
	1051.96	0.31	5.028E+001		-2.088E+001	2.294E+00
	1069.96	0.27	6.422E+001		1.100E+001	2.955E+00
	1120.29	14.92	1.290E+000		4.623E-001	5.965E-00
	1133.66	0.25	7.079E+001		-8.079E+000	3.248E+00
	1155.21	1.63	1.264E+001		3.452E+000	5.863E+00
	1207.68	0.45	3.461E+001		-3.167E+000	1.559E+00
	1238.11	5.83	3.528E+000		1.750E-001	1.629E+00
	1280.98	1.43	1.181E+001		5.236E+000	5.338E+00
	1303.75	0.11	1.607E+002		-2.850E+001	7.262E+00
	1377.67	3.99	5.210E+000		3.099E+000	2.388E+00
	1385.31	0.79	2.573E+001		1.652E+001	1.177E+00
	1401.52	1.33	1.244E+001		-8.266E+000	5.560E+00
	1407.99	2.39	7.067E+000		2.751E+000	3.165E+00
	1509.21	2.13	7.639E+000		2.870E+000	3.380E+00
	1538.53	0.40	3.557E+001		-1.591E+001	1.539E+00
	1543.34	0.30	4.538E+001		3.494E+000	1.954E+00
	1583.20	0.70	2.241E+001		1.348E+001	9.822E+00
	1594.75	0.27	5.801E+001		-2.086E+001	2.532E+00
	1599.37	0.32	4.232E+001		-1.736E+001	1.812E+00
	1661.27	1.05	1.576E+001		7.128E+000	6.906E+00
	1684.01	0.21	6.948E+001		8.381E+000	2.991E+00
	1729.59	2.88	5.116E+000		2.854E-001	2.190E+00
	1764.49	15.30	1.197E+000		4.193E-001	5.281E-00
	1838.36	0.35	3.944E+001		-4.615E+000	1.652E+00
	1847.43	2.03	5.796E+000		-5.343E-001	2.342E+00
	1873.16	0.21	5.167E+001		-2.582E+001	2.050E+00
	1896.05	0.15	9.978E+001		3.523E+001	4.214E+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	6.479E-001	1.38E-001	9.292E-001	3.038E-00
	77.11*	9.70	3.231E-001		5.365E-001	1.498E-00
	86.83	1.70	2.751E+000		1.140E+000	1.312E+00
	87.35	2.24	1.992E+000		-1.197E+000	9.485E-00
	89.78	0.82	5.027E+000		-5.282E+000	2.385E+00
	241.99	7.25	1.004E+000		-6.154E-002	4.799E-00
	258.76	0.53	1.107E+001		-1.935E+000	5.214E+00
	274.80	0.35	1.767E+001		1.141E+001	8.321E+00
	295.22	18.42	3.922E-001		1.610E-001	1.855E-00
	351.93*	35.60	1.382E-001		1.647E-001	6.249E-00
	462.02	0.21	4.388E+001		-1.109E+001	2.046E+00
	480.43	0.34	2.936E+001		-1.734E+001	1.371E+00
	487.14	0.43	2.292E+001		4.479E+000	1.069E+00
	533.66	0.18	6.050E+001		2.336E+001	2.824E+00
	580.14	0.37	3.395E+001		2.073E+001	1.591E+00
	785.96	1.06	1.265E+001		-1.395E+001	5.827E+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	2.342E+001	1.38E-001	6.568E+000	1.075E+00
	Ra-226	81.07	0.20	1.918E+001	1.56E+000	-1.283E+001	9.022E+00
		83.79	0.32	1.358E+001		8.802E+000	6.454E+00
		186.21	3.64	1.560E+000		1.931E+000	7.446E-00
	AC-228	89.96	1.90	1.884E+017	6.05E+016	-1.980E+017	8.938E+01
		93.35	3.10	1.173E+017		6.158E+016	5.575E+01
		99.51	1.26	2.337E+017		2.272E+016	1.098E+01
		104.82	0.39	7.811E+017		1.910E+017	3.678E+01
		105.60	0.74	4.138E+017		2.116E+017	1.949E+01
		108.58	0.28	1.110E+018		2.698E+017	5.235E+01
		129.07	2.42	1.336E+017		6.181E+016	6.302E+01
		145.85	0.16	2.104E+018		1.123E+017	9.914E+01
		153.98	0.72	4.480E+017		-3.601E+017	2.103E+01
		191.35	0.12	3.265E+018		-5.834E+017	1.540E+01
		199.41	0.31	1.401E+018		5.261E+017	6.632E+01
		204.03	0.11	3.851E+018		1.081E+018	1.818E+01
		209.25	3.89	1.149E+017		8.110E+016	5.429E+01
		214.85	0.76	5.959E+017		1.527E+015	2.814E+01
		270.24	3.46	1.465E+017		-7.749E+016	6.876E+01
		278.95	0.16	3.231E+018		-1.633E+018	1.515E+01
		321.65	0.23	2.531E+018		0.000E+000	1.183E+01
		327.44	0.12	5.199E+018		4.665E+017	2.442E+01
		328.00	2.95	2.131E+017		-2.614E+016	1.001E+01
		332.37	0.40	1.647E+018		-3.554E+017	7.756E+01
		338.32	11.27	6.051E+016		0.000E+000	2.852E+01
		340.96	0.37	1.743E+018		-1.978E+017	8.181E+01
		409.46	1.92	3.374E+017		-1.476E+016	1.562E+01
		440.44	0.12	6.535E+018		4.741E+018	3.054E+01
		463.00	4.40	1.828E+017		-9.807E+016	8.522E+01
		478.33	0.21	4.180E+018		-1.438E+018	1.955E+01
		503.82	0.18	5.388E+018		-9.205E+018	2.530E+01
		508.96	0.45	2.784E+018		3.363E+018	1.325E+01
		523.13	0.10	8.260E+018		-3.718E+018	3.830E+01
		546.47	0.20	5.146E+018		-3.271E+017	2.412E+01
		562.50	0.87	1.079E+018		-1.627E+017	5.013E+01
		570.91	0.18	5.151E+018		-3.432E+016	2.390E+01
		572.14	0.15	6.367E+018		-3.339E+017	2.958E+01
		583.41	0.11	9.705E+018		7.074E+018	4.541E+01
		674.75	2.10	5.601E+017		1.443E+017	2.611E+01
		701.75	0.17	6.411E+018		-1.490E+018	2.966E+01
		707.41	0.16	6.316E+018		-5.469E+018	2.889E+01
		726.86	0.62	1.946E+018		-7.652E+016	9.038E+01
		755.32	1.00	1.251E+018		2.295E+017	5.809E+01
		772.29	1.49	8.218E+017		-3.643E+017	3.805E+01
		782.14	0.49	2.642E+018		1.646E+017	1.227E+01
		794.95	4.25	2.959E+017		1.341E+017	1.370E+01
		830.49	0.54	2.248E+018		-3.976E+017	1.034E+01
		835.71	1.61	7.504E+017		6.387E+015	3.450E+01
		840.38	0.91	1.362E+018		9.597E+017	6.272E+01
		904.20	0.77	1.803E+018		-1.975E+018	8.335E+01
		911.20	25.80	6.402E+016		3.306E+016	2.997E+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	1.178E+019	6.05E+016	6.223E+018	5.378E+01
	958.61	0.28	5.407E+018		0.000E+000	2.507E+01
	964.77	4.99	3.569E+017		3.495E+017	1.674E+01
	968.97	15.80	1.096E+017		7.993E+016	5.131E+01
	1033.25	0.20	6.943E+018		2.485E+018	3.179E+01
	1065.18	0.13	1.192E+019		6.925E+018	5.501E+01
	1095.68	0.13	1.261E+019		-2.479E+018	5.826E+01
	1110.61	0.28	5.270E+018		-6.335E+018	2.416E+01
	1153.52	0.14	1.300E+019		3.864E+018	6.033E+01
	1247.08	0.50	3.462E+018		-6.315E+017	1.593E+01
	1459.14	0.83	4.774E+018		1.196E+019	2.292E+01
	1495.91	0.86	1.306E+018		-9.754E+017	5.592E+01
	1501.57	0.46	2.618E+018		3.688E+017	1.133E+01
	1557.11	0.18	5.511E+018		-3.879E+018	2.285E+01
	1580.53	0.60	2.034E+018		-6.439E+017	8.758E+01
	1588.20	3.22	4.277E+017		1.780E+017	1.874E+01
	1625.06	0.25	5.220E+018		7.976E+017	2.269E+01
	1630.63	1.51	7.432E+017		-4.148E+017	3.139E+01
	1638.28	0.47	2.497E+018		9.712E+017	1.062E+01
	1666.52	0.18	7.192E+018		-1.753E+018	3.096E+01
TH-230	67.67	0.38	1.273E+001	1.27E+001	6.261E-001	6.026E+00
PA-234	742.81	0.11	1.489E+002	1.90E+001	1.309E+002	6.972E+00
	766.42	0.32	4.215E+001		-3.619E+000	1.944E+00
TH-234	1001.03	0.84	1.897E+001	1.47E+000	-1.894E+001	8.704E+00
	63.29	3.70	1.468E+000		1.024E+000	6.963E-00
	92.38	2.13	2.023E+000		2.558E+000	9.625E-00
	92.80	2.10	2.042E+000		1.654E+000	9.712E-00
	112.81	0.21	1.662E+001		-3.185E+000	7.824E+00
U-234	53.20	0.12	4.554E+001	4.55E+001	1.865E+001	2.130E+00
	120.90	0.04	1.002E+002		1.830E+001	4.715E+00
U-235	72.70	0.12	4.200E+001	3.57E-001	-2.713E+000	2.000E+00
	89.96	3.43	1.201E+000		-1.262E+000	5.697E-00
	93.35	5.54	7.554E-001		3.964E-001	3.589E-00
	104.82	0.69	5.117E+000		1.251E+000	2.409E+00
	105.60	1.31	2.689E+000		1.375E+000	1.266E+00
	108.58	0.50	7.154E+000		1.738E+000	3.373E+00
	109.19	1.66	2.053E+000		-9.334E-001	9.650E-00
	140.76	0.20	2.113E+001		-2.511E-001	1.002E+00
	143.76	10.96	3.574E-001		-2.840E-001	1.687E-00
	163.36	5.08	6.782E-001		-3.658E-001	3.160E-00
	182.62	0.39	1.374E+001		6.911E-001	6.546E+00
	194.94	0.63	7.774E+000		-4.888E-001	3.675E+00
	202.12	1.08	4.537E+000		-8.573E-001	2.142E+00
	205.32	5.02	9.441E-001		-5.938E-001	4.443E-00
	221.39	0.12	4.309E+001		4.299E+000	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	^	9.39E+000	18.170			
Pb-210	46.5	^	2.30E+000	44.318			
Pb-212	74.8		5.24E-001	39.213	3.599[54.160]	4.84	-0.885
	77.1		3.04E-001	37.485	2.089[52.922]		[0.568]
	238.6	^	1.46E-001	37.358	1.000[52.833]		
PB-214	74.8		9.29E-001	40.221	5.641[60.603]	5.57	-0.952
	77.1		5.36E-001	38.551	3.257[59.508]		[0.501]
	351.9	^	1.65E-001	45.332	1.000[64.109]		