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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-2002\UNC-IMC-200

Report Generated On : 5/15/2017 10:42:41 AM

Sample Title : W3H-IMC-2002-S-P-3
Sample Description :
Sample Identification : IMC-2002-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 : 4.480E+002 grams

Sample Taken On : 5/3/2017 12:00:00 AM
Acquisition Started : 5/9/2017 10:59:15 AM

Live Time : 1800.0 seconds
Real Time : 1800.5 seconds

Dead Time : 0.03 %

Energy Calibration Used Done On : 4/13/2017
Efficiency Calibration Used Done On : 5/15/2017
Efficiency ID : H-IMC-2002-S-P-3

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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: W3H-IMC-2002-S-P-3
Peak Analysis Performed on: 5/15/2017 10:42:33 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	58-	70	65.29	16.45	0.72	2.04E+002	96.19	1.07E+002
M	2	286-	314	290.70	72.86	0.82	7.60E+001	39.08	1.74E+002
m	3	286-	314	299.52	75.07	0.83	2.22E+002	89.10	2.33E+002
m	4	286-	314	308.37	77.28	0.83	1.70E+002	68.53	2.19E+002
M	5	331-	365	337.61	84.59	0.74	1.40E+002	27.91	2.14E+002
m	6	331-	365	348.76	87.39	0.74	4.77E+001	20.62	2.20E+002
m	7	331-	365	359.47	90.07	0.75	5.96E+001	21.65	2.09E+002
F	8	365-	376	372.88	93.42	0.83	1.10E+002	82.83	1.58E+002
F	9	568-	580	574.80	143.95	0.82	1.45E+002	26.39	1.43E+002
F	10	643-	658	652.67	163.44	0.88	6.63E+001	70.84	1.42E+002
F	11	736-	750	741.78	185.74	0.92	7.85E+002	53.79	1.05E+002
F	12	814-	825	819.72	205.24	0.73	5.48E+001	19.13	8.25E+001
F	13	943-	958	953.06	238.61	1.01	2.47E+002	88.43	1.10E+002
F	14	1175-	1186	1179.24	295.21	0.78	3.68E+001	16.45	5.16E+001
F	15	1345-	1356	1350.73	338.12	1.15	4.21E+001	16.49	3.96E+001
F	16	1399-	1411	1405.55	351.84	0.99	9.96E+001	60.52	2.73E+001
F	17	2321-	2337	2328.23	582.74	1.34	7.15E+001	19.95	3.83E+001
F	18	2425-	2441	2433.38	609.05	1.17	8.00E+001	57.36	2.55E+001
F	19	5823-	5851	5835.69	1460.46	2.67	2.42E+002	31.40	9.67E+000

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

Errors quoted at 1.960 sigma

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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: W3H-IMC-2002-S-P-3
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 NLB 0328201

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.979	1460.82*	10.66	1.12720E+001	1.74696E+000
Pb-212	0.998	74.82*	10.28	1.60987E+000	7.22380E-001
		77.11*	17.10	7.19112E-001	3.24481E-001
		86.83	2.07		
		87.35*	3.97	7.95081E-001	3.79161E-001
		89.78*	1.46	2.65843E+000	1.10237E+000
		115.18	0.60		
		238.63*	43.60	5.12673E-001	2.00508E-001
		300.09	3.30		
BI-214	0.199	76.86*	0.55	2.25629E+001	1.02012E+001
		79.29	0.91		
		609.32*	45.49	4.06327E-001	2.95088E-001
		665.45	1.53		
		768.36	4.89		
		806.18	1.26		
		934.06	3.11		
		1120.29	14.92		
		1155.21	1.63		
		1238.11	5.83		
		1280.98	1.43		
		1377.67	3.99		
		1385.31	0.79		
		1401.52	1.33		
		1407.99	2.39		
		1509.21	2.13		
		1583.20	0.70		
		1661.27	1.05		
		1729.59	2.88		
		1764.49	15.30		
		1847.43	2.03		
		2118.51	1.16		
		2204.06	4.92		
		2447.70	1.55		
PB-214	0.849	74.82*	5.80	2.85335E+000	1.30556E+000
		77.11*	9.70	1.26771E+000	5.83299E-001
		86.83	1.70		
		87.35*	2.24	1.40914E+000	6.82680E-001
		89.78*	0.82	4.73331E+000	2.00521E+000
		241.99	7.25		
		258.76	0.53		
		295.22*	18.42	2.20799E-001	1.04706E-001
		351.93*	35.60	3.69902E-001	2.31187E-001

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
PB-214	0.849	785.96	1.06		
		839.07	0.58		
Ra-226	0.884	81.07	0.20		
		83.79*	0.32	2.93633E+001	8.29173E+000
		186.21*	3.64	1.59304E+001	2.91065E+000
U-235	0.998	89.96*	3.43	1.13157E+000	4.70620E-001
		93.35*	5.54	1.26982E+000	9.90874E-001
		104.82	0.69		
		105.60	1.31		
		108.58	0.50		
		109.19	1.66		
		143.76*	10.96	8.49386E-001	2.28300E-001
		163.36*	5.08	8.90493E-001	9.65872E-001
		194.94	0.63		
		202.12	1.08		
		205.32*	5.02	8.68636E-001	3.33065E-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	0.979	1.127202E+001	1.746955E+000
Pb-212	0.998	5.861822E-001	1.521473E-001
BI-214	0.199	4.056614E-001	2.949777E-001
PB-214	0.849	2.555869E-001	9.390171E-002
Ra-226	0.884	1.740402E+001	2.746359E+000
U-235	0.998	8.641472E-001	1.690469E-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: 5/15/2017 10:42:33 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	1	16.45	1.1347E-001	47.09		
M	2	72.86	4.2200E-002	51.45		
F	15	338.12	2.3369E-002	39.19		
F	17	582.74	3.9711E-002	27.91		

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 *****
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Detector Name: 8566
Sample Geometry: cylinder
Sample Title: W3H-IMC-2002-S-P-3
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 NLB 0328201

	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	8.945E-001	8.94E-001	1.127E+001	3.843E-00
	Pb-210	46.54	4.25	2.637E+000	2.64E+000	2.729E+000	1.265E+00
	BI-212	727.33	6.67	1.836E+000	1.84E+000	1.208E+000	8.627E-00
		785.37	1.10	1.136E+001		3.209E+000	5.319E+00
		1078.62	0.56	2.584E+001		2.433E+000	1.200E+00
		1620.50	1.47	6.944E+000		-2.121E+000	2.973E+00
+	Pb-212	74.82*	10.28	5.335E-001	1.30E-001	1.610E+000	2.569E-00
		77.11*	17.10	3.029E-001		7.191E-001	1.457E-00
		86.83	2.07	3.234E+000		-2.113E+000	1.574E+00
		87.35*	3.97	1.196E+000		7.951E-001	5.752E-00
		89.78*	1.46	3.121E+000		2.658E+000	1.500E+00
		115.18	0.60	8.155E+000		7.280E+000	3.938E+00
		238.63*	43.60	1.295E-001		5.127E-001	6.195E-00
		300.09	3.30	1.948E+000		6.474E-001	9.279E-00
+	BI-214	76.86*	0.55	9.505E+000	1.45E-001	2.256E+001	4.573E+00
		79.29	0.91	7.654E+000		-3.126E-001	3.721E+00
		609.32*	45.49	1.449E-001		4.063E-001	6.556E-00
		665.45	1.53	8.007E+000		1.208E+000	3.781E+00
		768.36	4.89	2.555E+000		1.098E+000	1.198E+00
		806.18	1.26	1.014E+001		7.185E+000	4.748E+00
		934.06	3.11	3.909E+000		-9.263E-001	1.806E+00
		1120.29	14.92	1.117E+000		4.696E-001	5.223E-00
		1155.21	1.63	9.600E+000		7.117E+000	4.462E+00
		1238.11	5.83	2.890E+000		1.018E+000	1.345E+00
		1280.98	1.43	9.954E+000		-1.704E+000	4.558E+00
		1377.67	3.99	3.889E+000		1.249E-001	1.784E+00
		1385.31	0.79	1.899E+001		5.514E+000	8.687E+00
		1401.52	1.33	9.837E+000		7.000E-001	4.431E+00
		1407.99	2.39	5.397E+000		1.896E-001	2.427E+00
		1509.21	2.13	5.372E+000		-2.792E-001	2.362E+00
		1583.20	0.70	1.849E+001		-1.315E+001	8.224E+00
		1661.27	1.05	1.159E+001		3.203E+000	5.079E+00
		1729.59	2.88	3.623E+000		7.391E-001	1.541E+00
		1764.49	15.30	1.172E+000		1.205E-001	5.342E-00
		1847.43	2.03	6.256E+000		-1.283E+000	2.720E+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
>		2447.70	1.55	0.000E+000		0.000E+000	0.000E+00
+	PB-214	74.82*	5.80	9.455E-001	1.07E-001	2.853E+000	4.554E-00
		77.11*	9.70	5.340E-001		1.268E+000	2.569E-00
		86.83	1.70	3.938E+000		-2.573E+000	1.916E+00
		87.35*	2.24	2.119E+000		1.409E+000	1.020E+00

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram
+	PB-214	89.78*	0.82	5.557E+000	1.07E-001	4.733E+000	2.671E+00
		241.99	7.25	1.229E+000		-1.599E+000	5.976E-00
		258.76	0.53	1.007E+001		-3.044E+000	4.789E+00
		295.22*	18.42	2.268E-001		2.208E-001	1.053E-00
		351.93*	35.60	1.068E-001		3.699E-001	4.840E-00
		785.96	1.06	1.159E+001		3.516E+000	5.421E+00
		839.07	0.58	2.277E+001		-5.215E+000	1.067E+00
+	Ra-226	81.07	0.20	2.911E+001	1.22E+000	2.143E+001	1.407E+00
		83.79*	0.32	1.478E+001		2.936E+001	7.108E+00
		186.21*	3.64	1.216E+000		1.593E+001	5.804E-00
	AC-228	89.96	1.90	1.276E+008	2.63E+007	-1.980E+008	6.194E+00
		93.35	3.10	7.742E+007		-4.262E+007	3.760E+00
		99.51	1.26	1.483E+008		-4.534E+007	7.149E+00
		105.60	0.74	2.701E+008		-9.055E+007	1.306E+00
		129.07	2.42	8.030E+007		5.533E+007	3.877E+00
		153.98	0.72	2.757E+008		-2.227E+007	1.329E+00
		209.25	3.89	5.768E+007		1.896E+007	2.773E+00
		214.85	0.76	2.614E+008		-2.382E+008	1.249E+00
		270.24	3.46	6.698E+007		3.549E+007	3.192E+00
		328.00	2.95	8.594E+007		-8.107E+007	4.073E+00
		338.32	11.27	2.625E+007		-2.458E+006	1.252E+00
		409.46	1.92	1.674E+008		2.780E+007	7.937E+00
		463.00	4.40	8.985E+007		7.848E+007	4.278E+00
		562.50	0.87	4.418E+008		2.338E+008	2.077E+00
		674.75	2.10	2.301E+008		9.693E+007	1.085E+00
		726.86	0.62	7.832E+008		4.542E+008	3.680E+00
		755.32	1.00	4.670E+008		-7.292E+007	2.183E+00
		772.29	1.49	3.464E+008		1.059E+008	1.628E+00
		794.95	4.25	1.096E+008		1.303E+007	5.105E+00
		830.49	0.54	9.848E+008		3.409E+008	4.618E+00
		835.71	1.61	3.260E+008		-1.580E+008	1.527E+00
		840.38	0.91	5.648E+008		-3.352E+008	2.640E+00
		904.20	0.77	8.374E+008		-1.061E+009	3.956E+00
		911.20	25.80	2.852E+007		4.203E+007	1.357E+00
		964.77	4.99	1.333E+008		1.230E+008	6.288E+00
		968.97	15.80	4.247E+007		4.618E+007	2.004E+00
		1247.08	0.50	1.283E+009		-1.400E+008	5.948E+00
		1459.14	0.83	1.878E+009		5.976E+009	9.068E+00
		1495.91	0.86	6.062E+008		-1.115E+008	2.715E+00
		1588.20	3.22	1.905E+008		1.324E+008	8.639E+00
		1630.63	1.51	2.697E+008		-8.238E+007	1.155E+00
	TH-230	67.67	0.38	1.827E+001	1.83E+001	-8.287E+000	8.835E+00
	PA-234	742.81	0.11	1.088E+002	1.72E+001	2.109E+001	5.085E+00
		766.42	0.32	3.813E+001		-2.053E+001	1.784E+00
		1001.03	0.84	1.716E+001		9.131E+000	7.997E+00
	TH-234	63.29	3.70	1.932E+000	1.93E+000	7.634E-001	9.324E-00
		92.38	2.13	3.072E+000		5.436E+000	1.495E+00
		92.80	2.10	2.991E+000		1.529E-001	1.454E+00
		112.81	0.21	2.273E+001		-2.486E+001	1.097E+00
	U-234	53.20	0.12	7.264E+001	7.26E+001	4.959E+001	3.496E+00
		120.90	0.04	1.355E+002		-1.179E+002	6.535E+00

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/gram)	Nuclide MDA (pCi/gram)	Activity (pCi/gram)	Dec. Leve (pCi/gram
+	U-235	89.96*	3.43	1.329E+000	3.90E-001	1.132E+000	6.386E-00
		93.35*	5.54	8.589E-001		1.270E+000	4.138E-00
		104.82	0.69	7.400E+000		3.688E+000	3.578E+00
		105.60	1.31	3.845E+000		-1.289E+000	1.859E+00
		108.58	0.50	1.031E+001		-9.235E-001	4.986E+00
		109.19	1.66	3.077E+000		-1.792E-001	1.489E+00
		143.76*	10.96	3.897E-001		8.494E-001	1.869E-00
		163.36*	5.08	9.483E-001		8.905E-001	4.560E-00
		194.94	0.63	8.078E+000		-2.262E+000	3.875E+00
		202.12	1.08	5.336E+000		6.736E-001	2.569E+00
		205.32*	5.02	7.921E-001		8.686E-001	3.746E-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
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Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-2002\UNC-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	^	1.13E+001	15.498			
Pb-212	74.8		1.61E+000	44.872	3.140[59.524]	4.35	-0.784
	77.1		7.19E-001	45.123	1.403[59.713]		[0.581]
	87.3		7.95E-001	47.688	1.551[61.675]		
	89.8		2.66E+000	41.467	5.185[57.001]		
	238.6	^	5.13E-001	39.110	1.000[55.310]		
BI-214	76.9		2.26E+001	45.212	55.529[85.547]	12.44	-1.940
	609.3	^	4.06E-001	72.623	1.000[102.70]		[0.646]
PB-214	74.8		2.85E+000	45.755	7.714[77.458]	8.28	-1.475
	77.1		1.27E+000	46.012	3.427[77.610]		[0.513]
	87.3		1.41E+000	48.447	3.809[79.078]		
	89.8		4.73E+000	42.364	12.796[75.504]		
	295.2		2.21E-001	47.421	0.597[78.454]		
	351.9	^	3.70E-001	62.499	1.000[88.388]		
Ra-226	83.8		2.94E+001	28.238	1.843[33.634]	4.00	-0.766
	186.2	^	1.59E+001	18.271	1.000[25.839]		[0.531]
U-235	90.0		1.13E+000	41.590	1.332[49.519]	2.03	-0.391
	93.3		1.27E+000	78.033	1.495[82.532]		[0.761]
	143.8	^	8.49E-001	26.878	1.000[38.011]		
	163.4		8.90E-001	108.46	1.048[111.74]		
	205.3		8.69E-001	38.343	1.023[46.826]		