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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-1451\W6H-IMC-145

Report Generated On : 3/21/2017 11:14:06 AM

Sample Title : W6H-IMC-1451-S-P-2

Sample Description : UNC 2017

Sample Identification : W6H-IMC-1451-S-P

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 : 3.064E+002 GRAMS

Sample Taken On : 2/28/2017 12:00:00 PM

Acquisition Started : 3/21/2017 10:21:28 AM

Live Time : 1800.0 seconds

Real Time : 1800.7 seconds

Dead Time : 0.04 %

Energy Calibration Used Done On : 3/9/2017

Efficiency Calibration Used Done On : 3/21/2017

Efficiency ID : H-IMC-1451-S-P-2

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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: 8381

Sample Title: W6H-IMC-1451-S-P-2

Peak Analysis Performed on: 3/21/2017 11:14:03 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-	192	186.62	46.63	0.54	1.22E+002	24.06	6.30E+001
M	2	296-	315	300.04	75.00	0.62	9.27E+001	22.58	4.83E+001
m	3	296-	315	308.74	77.18	0.63	5.84E+001	17.61	3.79E+001
F	4	735-	749	743.13	185.84	0.88	5.52E+001	18.00	4.25E+001
F	5	947-	958	954.35	238.67	0.64	4.69E+001	16.94	4.20E+001
F	6	2325-	2337	2331.03	583.05	1.31	3.13E+001	14.18	2.06E+001
F	7	5826-	5851	5839.78	1460.75	2.06	1.77E+002	69.27	1.16E+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-1451-S-P-2  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 8381.NLB

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GRAM)	Activity Uncertainty
K-40	0.999	1460.82*	10.66	7.41837E+000	2.96784E+000
PB-212	1.000	238.63*	43.60	1.04143E-001	4.10986E-002
		300.09	3.30		

\* = 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	7.418374E+000	2.967841E+000
PB-212	1.000	1.041429E-001	4.109864E-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: 3/21/2017 11:14:03 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	46.63	6.7528E-002	19.80		
M 2	75.00	5.1481E-002	24.36		
m 3	77.18	3.2438E-002	30.16		
F 4	185.84	3.0669E-002	32.60		
F 6	583.05	1.7390E-002	45.29		

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 M D A R E P O R T \*\*\*\*\*  
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Detector Name: 8381  
Sample Geometry: Cylinder  
Sample Title: W6H-IMC-1451-S-P-2  
Nuclide Library Used: C:\GENIE2K\CAMFILES\UNC 2017 8381.NLB

	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	8.453E-001	8.45E-001	7.418E+000	3.660E-00
	CO-60	1173.23	99.85	1.470E-001	1.01E-001	1.850E-002	6.837E-00
		1332.49	99.98	1.006E-001		-6.789E-002	4.461E-00
	CS-137	661.66	85.10	1.108E-001	1.11E-001	6.937E-004	5.164E-00
	BI-212	727.33	6.67	1.606E+000	1.61E+000	4.407E-001	7.511E-00
		785.37	1.10	9.946E+000		1.660E+000	4.638E+00
		1620.50	1.47	6.631E+000		-5.011E+000	2.870E+00
+	PB-212	238.63*	43.60	8.091E-002	8.09E-002	1.041E-001	3.745E-00
		300.09	3.30	1.415E+000		-1.727E-001	6.594E-00
	BI-214	609.32	45.49	2.262E-001	2.26E-001	1.267E-001	1.065E-00
		665.45	1.53	6.444E+000		3.560E+000	3.013E+00
		768.36	4.89	2.277E+000		1.238E+000	1.064E+00
		806.18	1.26	8.988E+000		-3.698E+000	4.196E+00
		934.06	3.11	3.915E+000		1.895E+000	1.821E+00
		1120.29	14.92	1.045E+000		5.256E-001	4.897E-00
		1155.21	1.63	7.872E+000		-4.535E+000	3.628E+00
		1238.12	5.83	2.625E+000		7.021E-001	1.221E+00
		1280.98	1.43	9.227E+000		2.964E-001	4.234E+00
		1377.67	3.99	3.273E+000		-1.324E+000	1.492E+00
		1401.52	1.33	9.561E+000		-9.203E+000	4.341E+00
		1407.99	2.39	5.616E+000		4.528E-001	2.563E+00
		1509.21	2.13	5.166E+000		1.462E+000	2.292E+00
		1729.59	2.88	3.679E+000		1.296E+000	1.599E+00
		1764.49	15.30	1.078E+000		8.010E-001	4.931E-00
		1847.43	2.03	5.832E+000		-2.543E-001	2.555E+00
	PB-214	53.23	1.08	3.467E+000	1.77E-001	1.783E+000	1.580E+00
		241.99	7.25	7.529E-001		-3.747E-001	3.582E-00
		295.22	18.42	2.901E-001		2.558E-001	1.366E-00
		351.93	35.60	1.770E-001		-8.386E-002	8.337E-00
		785.96	1.06	1.035E+001		7.351E+000	4.825E+00
	U-234	53.20	0.12	3.033E+001	3.03E+001	1.560E+001	1.382E+00
		120.90	0.04	6.662E+001		-1.735E+001	3.065E+00
	U-235	105.60	1.31	1.864E+000	2.41E-001	1.309E-001	8.613E-00
		109.19	1.66	1.534E+000		5.153E-001	7.113E-00
		143.76	10.96	2.414E-001		-6.106E-002	1.118E-00
		163.36	5.08	5.994E-001		2.981E-002	2.795E-00
		202.12	1.08	3.173E+000		-1.083E+000	1.479E+00
		205.32	5.02	7.793E-001		-7.777E-002	3.663E-00
	U-238	63.29	3.70	1.134E+000	7.73E-001	4.072E-001	5.328E-00
		92.60	4.23	7.728E-001		3.418E-001	3.639E-00
		766.42	0.32	3.428E+001		5.067E+000	1.601E+00
		1001.03	0.84	1.416E+001		1.847E+000	6.547E+00

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GRAM)	Nuclide MDA (pCi/GRAM)	Activity (pCi/GRAM)	Dec. Leve (pCi/GRAM)
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+ = 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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\*\*\* LINE ACTIVITY CONSISTENCY EVALUATOR \*\*\*  
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Analysis using Key Line Activities  
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Filename: C:\GENIE2K\CAMFILES\UNC 2017\IMC Samples\IMC-1451\W6H-IMC-145

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]
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K-40	1460.8	^	7.42E+000	40.007			
PB-212	238.6	^	1.04E-001	39.464			