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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-1483\UNC-IMC-148

Report Generated On : 5/4/2017 8:38:21 AM

Sample Title : UNC-IMC-1483-S-P-8

Sample Description :

Sample Identification : IMC-1483-S-P-8

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 : 3.239E+002 grams

Sample Taken On : 4/10/2017 12:00:00 AM

Acquisition Started : 4/25/2017 12:07:25 PM

Live Time : 1800.0 seconds

Real Time : 1800.4 seconds

Dead Time : 0.02 %

Energy Calibration Used Done On : 4/13/2017

Efficiency Calibration Used Done On : 5/4/2017

Efficiency ID : H-IMC-1483-S-P-8

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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: UNC-IMC-1483-S-P-8

Peak Analysis Performed on: 5/4/2017 8:38:18 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	59-	72	65.12	16.41	0.81	2.17E+002	98.80	1.37E+002
F	2	94-	107	103.59	26.03	0.15	6.58E+001	41.64	1.23E+002
F	3	208-	221	213.35	53.50	0.60	8.79E+001	68.03	1.03E+002
M	4	296-	317	299.83	75.14	0.70	1.23E+002	26.58	1.79E+002
m	5	296-	317	308.39	77.28	0.71	9.67E+001	23.79	2.02E+002
F	6	331-	344	337.18	84.49	0.60	2.04E+002	97.57	2.08E+002
F	7	356-	364	359.49	90.07	0.72	9.48E+001	22.20	1.04E+002
F	8	365-	379	373.08	93.47	0.88	1.61E+002	88.47	1.75E+002
F	9	431-	441	435.61	109.12	0.97	8.16E+001	90.56	1.03E+002
F	10	568-	582	574.37	143.84	0.84	3.20E+002	34.40	1.28E+002
F	11	645-	658	652.51	163.40	0.95	1.29E+002	23.52	8.93E+001
F	12	736-	750	741.93	185.77	0.90	1.33E+003	68.95	1.18E+002
F	13	812-	827	820.05	205.32	1.02	9.48E+001	67.94	7.60E+001
F	14	945-	957	953.44	238.70	0.63	1.07E+002	56.35	5.85E+001
F	15	1175-	1186	1179.16	295.19	0.77	2.36E+001	14.31	4.32E+001
F	16	1347-	1356	1351.77	338.38	0.58	2.03E+001	11.89	2.70E+001
F	17	1401-	1411	1405.05	351.72	0.65	3.45E+001	14.37	2.97E+001
F	18	2424-	2441	2433.00	608.96	1.42	4.17E+001	15.39	2.40E+001
F	19	5825-	5848	5835.71	1460.47	2.18	1.45E+002	24.53	5.33E+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: UNC-IMC-1483-S-P-8  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\GE\_UNC\_U-NLB.NLB

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

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/gram)	Activity Uncertainty
K-40	0.980	1460.82*	10.66	7.57319E+000	1.43148E+000
U-234	0.989	53.20*	0.12	8.87526E+001	7.19206E+001
		120.90	0.04		
U-235	0.999	105.60	1.31		
		109.19*	1.66	3.23499E+000	3.67757E+000
		143.76*	10.96	2.03189E+000	4.57093E-001
		163.36*	5.08	1.87885E+000	4.91514E-001
		202.12	1.08		
		205.32*	5.02	1.64842E+000	1.20937E+000

\* = 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	0.980	7.573190E+000	1.431481E+000
U-234	0.989	8.875260E+001	7.192064E+001
U-235	0.999	1.948579E+000	3.213595E-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: 5/4/2017 8:38:18 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	16.41	1.2082E-001	45.43		
F	2	26.03	3.6550E-002	63.29		
M	4	75.14	6.8358E-002	21.60		
m	5	77.28	5.3740E-002	24.60		
F	6	84.49	1.1309E-001	47.93		
F	7	90.07	5.2687E-002	23.41		
F	8	93.47	8.9719E-002	54.78		
F	12	185.77	7.3755E-001	5.19		
F	14	238.70	5.9462E-002	52.65		
F	15	295.19	1.3107E-002	60.66		
F	16	338.38	1.1299E-002	58.48		
F	17	351.72	1.9159E-002	41.68		
F	18	608.96	2.3141E-002	36.94		

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: 8566  
 Sample Geometry: cylinder  
 Sample Title: UNC-IMC-1483-S-P-8  
 Nuclide Library Used: C:\GENIE2K\CAMFILES\GE\_UNC\_U-NLB.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	7.456E-001	7.46E-001	7.573E+000	3.023E-00
	PA-234	742.81	0.11	1.175E+002	1.78E+001	-9.328E+000	5.485E+00
		766.42	0.32	4.126E+001		6.098E+000	1.927E+00
		1001.03	0.84	1.782E+001		1.099E+001	8.264E+00
	TH-234	63.29	3.70	1.899E+000	1.90E+000	1.247E+000	9.151E-00
		92.38	2.13	3.374E+000		7.349E+000	1.644E+00
		92.80	2.10	3.252E+000		-5.338E-001	1.582E+00
		112.81	0.21	2.379E+001		3.862E+000	1.147E+00
+	U-234	53.20*	0.12	6.418E+001	6.42E+001	8.875E+001	3.072E+00
		120.90	0.04	1.417E+002		5.885E+001	6.829E+00
+	U-235	105.60	1.31	3.889E+000	4.17E-001	1.258E-001	1.877E+00
		109.19*	1.66	2.331E+000		3.235E+000	1.112E+00
		143.76*	10.96	4.173E-001		2.032E+000	2.001E-00
		163.36*	5.08	7.931E-001		1.879E+000	3.768E-00
		202.12	1.08	5.504E+000		-1.815E+000	2.644E+00
		205.32*	5.02	9.105E-001		1.648E+000	4.317E-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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\*\*\* 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-1483\UNC-IMC-148

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	^	7.57E+000	18.902			
U-234	53.2	^	8.88E+001	81.035			
U-235	109.2		3.23E+000	113.68	1.592[115.88]	4.25	-0.849
	143.8	^	2.03E+000	22.496	1.000[31.814]		[ 1.813]
	163.4		1.88E+000	26.160	0.925[34.503]		
	205.3		1.65E+000	73.366	0.811[76.737]		