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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        *****
*************************************************************************


Filename: ERT01,C:\GENIE2K\CAMFILES\SMP-HTC-A01-S005-0612-02.CNF

Report Generated On              : 6/13/2017   9:30:24 AM

Sample Title                     : HTC-A01-S005-0612-02
Sample Description               : 450 cc Soil
Sample Identification            :
Sample Type                      :
Sample Geometry                  :

Peak Locate Threshold            :  3.00
Peak Locate Range (in channels)  :   100 -  8192
Peak Area Range (in channels)    :   100 -  8192
Identification Energy Tolerance  :    1.000 keV

Sample Size                      :  8.118E+002 GWET

Sample Taken On                  : 5/13/2017   9:58:00 AM
Acquisition Started              : 6/13/2017   7:30:19 AM

Live Time                        :     7200.0 seconds
Real Time                        :     7202.3 seconds

Dead Time                        :   0.03 %


              Energy Calibration Used Done On       : 5/10/2017
              Efficiency Calibration Used Done On   : 12/14/2016
              Efficiency ID                         : ERT0101
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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: ERT01
Sample Title: HTC-A01-S005-0612-02
Peak Analysis Performed on: 6/13/2017 9:30:24 AM
Peak Analysis From Channel: 100
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	294-	316	300.16	74.90	0.96	2.40E+002	26.32	6.76E+002
m	2	294-	316	309.31	77.19	0.97	4.76E+002	31.54	6.81E+002
	3	344-	355	350.38	87.45	0.70	1.27E+002	43.39	7.00E+002
	4	366-	386	372.49	92.98	1.24	3.30E+002	64.56	1.05E+003
	5	510-	522	517.19	129.14	0.94	5.07E+001	40.04	5.86E+002
	6	735-	754	744.94	186.06	1.20	3.90E+002	52.63	6.79E+002
	7	832-	845	838.50	209.44	1.10	1.64E+002	36.36	4.20E+002
M	8	949-	977	955.35	238.65	1.02	1.50E+003	43.34	4.06E+002
m	9	949-	977	967.90	241.78	1.02	2.85E+002	21.99	3.52E+002
	10	1077-	1090	1081.47	270.17	1.33	1.68E+002	30.82	2.77E+002
	11	1104-	1114	1110.61	277.45	0.75	3.15E+001	23.79	2.24E+002
	12	1175-	1188	1181.52	295.17	1.25	5.01E+002	34.88	2.60E+002
	13	1193-	1209	1201.06	300.05	0.99	8.20E+001	32.18	3.04E+002
	14	1307-	1322	1312.85	327.99	0.47	7.73E+001	28.55	2.45E+002
	15	1347-	1360	1354.04	338.29	1.03	3.10E+002	29.58	2.05E+002
	16	1401-	1418	1408.33	351.86	1.18	9.64E+002	42.51	2.56E+002
	17	1632-	1645	1638.06	409.27	1.26	7.72E+001	21.18	1.34E+002
	18	1843-	1859	1853.07	463.01	0.25	5.80E+001	24.37	1.71E+002
	19	2029-	2054	2043.87	510.69	1.73	4.05E+002	37.42	2.35E+002
	20	2327-	2341	2333.54	583.08	1.18	4.99E+002	30.59	1.50E+002
	21	2428-	2448	2438.36	609.28	1.28	7.53E+002	37.20	1.74E+002
	22	2901-	2920	2910.80	727.35	1.27	1.52E+002	21.13	8.31E+001
	23	3064-	3082	3074.33	768.22	1.15	7.68E+001	21.12	1.09E+002
	24	3173-	3190	3180.73	794.81	0.78	6.23E+001	18.82	8.97E+001
	25	3339-	3350	3344.85	835.83	0.65	1.13E+001	12.96	6.17E+001
	26	3437-	3454	3444.62	860.76	1.74	9.01E+001	17.45	6.59E+001
	27	3637-	3658	3646.80	911.29	1.38	4.54E+002	27.13	7.65E+001
M	28	3854-	3889	3860.65	964.74	1.44	6.38E+001	11.56	9.05E+001
m	29	3854-	3889	3878.29	969.15	1.45	2.31E+002	17.65	8.53E+001
	30	4478-	4492	4483.96	1120.51	1.16	1.48E+002	20.70	9.59E+001
	31	4949-	4965	4956.78	1238.68	1.28	4.91E+001	19.01	9.89E+001
	32	5630-	5642	5636.93	1408.66	1.35	2.30E+001	9.33	2.40E+001
	33	5836-	5862	5848.60	1461.56	1.79	2.13E+003	47.68	3.33E+001
	34	6919-	6932	6925.08	1730.60	0.78	2.73E+001	8.76	1.77E+001
	35	7056-	7076	7066.09	1765.84	1.45	1.58E+002	15.05	1.86E+001
	36	7665-	7678	7671.15	1917.05	0.43	1.10E+001	4.45	3.00E+000

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

Errors quoted at 1.000 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: ERT01
Sample Geometry:
Sample Title: HTC-A01-S005-0612-02
Nuclide Library Used: C:\GENIE2K\CAMFILES\ERT_LIBRARY_LMDA.NLB

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	K-40	1460.82*	10.55	4.8466E-001	4.85E-001	1.6267E+001
	Co-60	1173.23	99.85	7.7379E-002	6.40E-002	3.3537E-002
		1332.49	99.98	6.3976E-002		2.4547E-002
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	3.5488E+003	6.15E-002	1.0018E+003
		661.66	84.99	6.1525E-002		1.7517E-002
+	Tl-208	72.80	2.02	6.0878E+000	5.11E-002	4.5586E-001
		74.97*	3.41	2.1619E+000		2.9869E+000
		84.90	1.51	5.4545E+000		2.3930E+000
		277.36*	6.31	4.9913E-001		1.4271E-001
		510.77*	22.60	2.8654E-001		4.1095E-001
		583.19*	84.50	5.1100E-002		2.4842E-001
		763.13	1.81	3.4149E+000		9.9060E-001
		860.56*	12.42	3.1707E-001		4.0343E-001
+	Bi-212	39.86	1.06	6.6315E+002	6.02E-001	1.5434E+001
		727.33*	6.74	6.0246E-001		1.1091E+000
		785.37	1.11	5.1470E+000		2.0122E+000
		1620.74	1.51	3.4938E+000		2.2068E+000
		1806.00	0.09	4.2844E+001		-3.6769E-001
+	Pb-212	74.81*	10.40	7.0887E-001	8.40E-002	9.7935E-001
		77.11*	17.50	3.8795E-001		1.0591E+000
		87.30*	7.81	7.4502E-001		4.7871E-001
		115.18	0.59	8.4321E+000		2.8751E+000
		238.63*	43.30	8.4010E-002		8.9741E-001
		300.09*	3.28	1.3285E+000		7.4444E-001
+	Bi-214	76.86*	0.43	1.5456E+001	1.12E-001	4.2194E+001
		89.81	0.24	3.1230E+001		4.4677E+000
		386.77	0.30	1.5381E+001		-2.2172E+000
		454.77	0.29	1.6813E+001		7.7041E+000
		609.31*	45.49	1.1155E-001		7.0367E-001
		665.45	1.53	3.3628E+000		-1.8645E+000
		703.11	0.48	1.1492E+001		5.5299E+000
		719.86	0.39	1.2532E+001		-3.3888E+000
		768.36*	4.89	9.3335E-001		7.7791E-001
		786.10	0.31	1.7861E+001		3.6800E+000
		806.17	1.26	4.2737E+000		2.0692E+000
		934.06	3.10	1.9242E+000		3.4850E-001
		964.08*	0.36	1.0612E+001		1.0368E+001
		1051.96	0.31	1.9412E+001		-1.5502E+001
		1120.29*	14.91	3.5995E-001		6.6143E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	2.7677E+001	1.12E-001	4.2052E+000
		1155.19	1.63	4.3476E+000		7.6989E-002
		1207.68	0.45	1.8068E+001		1.6946E+001
		1238.11*	5.79	1.0575E+000		6.1155E-001
		1280.96	1.43	4.7334E+000		4.2243E+000
		1377.67	4.00	1.6202E+000		6.9475E-001
		1385.31	0.76	7.8049E+000		-8.0039E+000
		1401.50	1.27	4.3842E+000		2.3167E+000
		1407.98*	2.15	1.4735E+000		8.4844E-001
		1509.23	2.11	2.6923E+000		6.8811E-001
		1538.50	0.38	1.3320E+001		6.0063E+000
		1543.32	0.20	2.5233E+001		5.5715E+000
		1583.22	0.69	8.2566E+000		1.1185E+000
		1594.73	0.25	2.5271E+001		1.0850E+001
		1599.31	0.23	2.1510E+001		1.1585E+001
		1661.28	1.15	4.1344E+000		-8.6276E-002
		1683.99	0.22	2.1109E+001		-9.9100E-001
		1729.59	2.92	1.7879E+000		1.1153E+000
		1764.49	15.40	5.5751E-001		9.8452E-001
		1847.42	2.11	2.4535E+000		2.8729E-001
		1873.16	0.22	1.9151E+001		6.0172E+000
>		2118.55	1.14	0.0000E+000		0.0000E+000
>		2204.21	5.08	0.0000E+000		0.0000E+000
+	Pb-214	53.28	1.20	3.5246E+001	1.16E-001	2.0405E+001
		74.81*	6.44	1.1102E+000		1.5338E+000
		77.11*	10.80	6.0966E-001		1.6643E+000
		87.30*	4.84	1.1659E+000		7.4915E-001
		242.00*	7.43	4.3656E-001		9.8666E-001
		258.87	0.52	9.4055E+000		6.0874E+000
		274.80	0.47	1.0574E+001		-6.6687E-001
		295.22*	19.30	1.8857E-001		7.4327E-001
		351.93*	37.60	1.1615E-001		7.9973E-001
		462.00	0.22	2.2929E+001		1.2412E+001
		533.66	0.19	2.4083E+001		-8.3391E+000
		785.96	1.07	5.1714E+000		1.0655E+000
		839.04	0.59	9.7889E+000		5.2613E+000
+	Ra-224	81.07	0.13	6.3524E+001	8.16E-001	-4.6282E+001
		83.78	0.22	3.6424E+001		8.2213E+000
		240.99*	4.10	8.1574E-001		1.8436E+000
+	Ra-226	81.07	0.20	4.0967E+001	1.47E+000	-2.9848E+001
		83.78	0.33	2.3370E+001		5.2750E+000
		94.90	0.15	4.4031E+001		1.8109E-001
		186.21*	3.59	1.4652E+000		2.1399E+000
+	Ac-228	99.50	1.26	4.3123E+000	1.82E-001	1.5816E+000
		129.07*	2.50	1.5899E+000		4.3347E-001
		209.25*	3.97	9.9834E-001		1.0196E+000
		270.24*	3.55	1.0536E+000		1.3296E+000
		328.00*	3.04	1.3245E+000		7.9389E-001
		338.32*	11.40	3.1508E-001		8.6220E-001
		409.46*	2.02	1.6010E+000		1.3391E+000

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Ac-228	463.00*	4.45	9.2782E-001	1.82E-001	4.8746E-001
		755.31	1.03	5.2013E+000		1.0689E+000
		772.29	1.52	4.2173E+000		1.6832E+000
		794.94*	4.31	9.9933E-001		7.5807E-001
		835.70*	1.70	1.9485E+000		3.6108E-001
		911.20*	26.20	1.8244E-001		9.9523E-001
		964.79*	4.99	7.9594E-001		7.7768E-001
		968.96*	15.90	2.4362E-001		8.8528E-001
		1588.20	3.06	2.1938E+000		1.0281E+000
		1630.62	1.52	3.4345E+000		-4.2721E-001
	Th-228	84.37	1.26	6.4326E+000	6.43E+000	2.3667E+000
		131.61	0.13	3.9673E+001		2.4326E+000
		166.41	0.10	4.7608E+001		-5.9699E+000
		215.98	0.25	2.1094E+001		9.1506E+000
	Pa-234m	258.23	0.07	6.5705E+001	7.10E+000	-3.4327E+001
		742.81	0.09	5.4630E+001		2.3998E+001
		766.36	0.32	1.9488E+001		1.0963E+001
		786.27	0.05	1.0289E+002		2.9943E+001
		1001.03	0.85	7.0962E+000		3.1198E+000
		1737.77	0.02	2.2269E+002		-1.9530E+002
	Th-234	63.30	3.75	4.6073E+000	1.68E+000	9.2205E-001
		92.59	4.33	1.6775E+000		6.1508E-001
		112.81	0.22	2.3108E+001		-4.3577E+000

+ = Nuclide identified during the nuclide identification
* = Energy line found in the spectrum
> = Calculated MDA is zero due to zero counts in the region, or the region is outside the spectrum, or has not been calculated
@ = Half-life too short to be able to perform the decay correction

****
***** 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: HTC-A01-S005-0612-02
Nuclide Library Used: C:\GENIE2K\CAMFILES\ERT_LIBRARY_LMDA.NLB

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

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
K-40	0.916	1460.82*		10.55	1.62673E+001	5.74572E-001
Tl-208	0.935	72.80	@	2.02		
		74.97*	@	3.41	2.98687E+000	3.39726E-001
		84.90	@	1.51		
		277.36*		6.31	1.42706E-001	1.07860E-001
		510.77*	@	22.60	4.10951E-001	6.75470E-002
		583.19*		84.50	2.48416E-001	1.73074E-002
		763.13	@	1.81		
		860.56*		12.42	4.03431E-001	7.87654E-002
Bi-211	0.897	351.03*		13.00	2.31922E+000	1.32917E-001
Bi-212	0.581	39.86	@	1.06		
		727.33*		6.74	1.10913E+000	1.58085E-001
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.986	74.81*		10.40	9.79349E-001	1.14917E-001
		77.11*		17.50	1.05907E+000	8.26672E-002
		87.30*		7.81	4.78706E-001	1.64857E-001
		115.18	@	0.59		
		238.63*		43.30	8.97407E-001	3.96518E-002
		300.09*		3.28	7.44443E-001	2.93286E-001
Bi-214	0.498	76.86*	@	0.43	4.21935E+001	3.32440E+000
		89.81	@	0.24		
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	7.03669E-001	4.04727E-002
		665.45	@	1.53		
		703.11	@	0.48		
		719.86	@	0.39		
		768.36*		4.89	7.77909E-001	2.14959E-001
		786.10	@	0.31		
		806.17	@	1.26		
		934.06		3.10		
		964.08*	@	0.36	1.03681E+001	1.92534E+000
		1051.96	@	0.31		
		1120.29*		14.91	6.61434E-001	9.38537E-002
		1133.66	@	0.25		
		1155.19	@	1.63		
		1207.68	@	0.45		
		1238.11*		5.79	6.11548E-001	2.37479E-001
		1280.96	@	1.43		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.498	1377.67		4.00		
		1385.31	@	0.76		
		1401.50	@	1.27		
		1407.98*	@	2.15	8.48436E-001	3.45555E-001
		1509.23	@	2.11		
		1538.50	@	0.38		
		1543.32	@	0.20		
		1583.22	@	0.69		
		1594.73	@	0.25		
		1599.31	@	0.23		
		1661.28	@	1.15		
		1683.99	@	0.22		
		1729.59	@	2.92		
		1764.49		15.40		
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.941	53.28	@	1.20		
		74.81*		6.44	1.53384E+000	1.81486E-001
		77.11*		10.80	1.66430E+000	1.35702E-001
		87.30*		4.84	7.49150E-001	2.58382E-001
		242.00*		7.43	9.86655E-001	8.36258E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	7.43274E-001	5.76037E-002
		351.93*		37.60	7.99731E-001	4.51271E-002
		462.00	@	0.22		
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.797	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	1.84364E+000	1.55493E-001
Ra-226	0.773	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	2.13993E+000	3.40164E-001
Ac-228	0.870	99.50	@	1.26		
		129.07*	@	2.50	4.33466E-001	3.42755E-001
		209.25*		3.97	1.01963E+000	2.30168E-001
		270.24*		3.55	1.32961E+000	2.51069E-001
		328.00*		3.04	7.93886E-001	2.95664E-001
		338.32*		11.40	8.62197E-001	9.21520E-002
		409.46*	@	2.02	1.33906E+000	3.72096E-001
		463.00*		4.45	4.87464E-001	2.07184E-001
		755.31	@	1.03		
		772.29	@	1.52		
		794.94*		4.31	7.58069E-001	2.30967E-001
		835.70*	@	1.70	3.61081E-001	4.14919E-001

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Ac-228	0.870	911.20*	26.20	9.95230E-001	7.13225E-002
		964.79*	4.99	7.77685E-001	1.44557E-001
		968.96*	15.90	8.85278E-001	7.60247E-002
		1588.20	3.06		
		1630.62 @	1.52		

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.45
Errors quoted at 1.000 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/GWET)	Wt mean Activity Uncertainty
	K-40		0.916	1.626726E+001	5.745721E-001
X	Mn-54		0.855		
X	Cd-109		0.947		
	Tl-208	@	0.935	2.507965E-001	1.657191E-002
	Bi-211		0.897	5.857854E-001	1.953453E-001
	Bi-212	@	0.581	1.109127E+000	1.580855E-001
	Pb-212	@	0.986	7.913424E-001	3.362527E-002
	Bi-214	@	0.498	6.957985E-001	3.610774E-002
	Pb-214	@	0.941	5.977362E-001	5.072822E-002
	Ra-224	@	0.797	7.267247E-001	1.807141E-001
	Ra-226	@	0.773	2.139933E+000	3.401638E-001
	Ac-228	@	0.870	9.026626E-001	3.749836E-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 1.000 sigma

********** U N I D E N T I F I E D P E A K S **********

Peak Locate Performed on: 6/13/2017 9:30:24 AM
Peak Locate From Channel: 100
Peak Locate To Channel: 8192

Peak No.	Energy (keV)	Peak Size in Counts per Second	Peak CPS % Uncertainty	Peak Type	Tol. Nuclide
4	92.98	3.5289E-002	25.52	Tol.	Yb-169 Th-227 Th-234
34	1730.60	3.7932E-003	32.07	Sum	
35	1765.84	2.2006E-002	9.50		
36	1917.05	1.5278E-003	40.44		

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

Errors quoted at 1.000 sigma