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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-NFB-A04-S003-1824-01.CNF

Report Generated On              : 6/3/2017   12:25:55 AM

Sample Title                     : NFB-A04-S003-1824-01
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                      :  8.072E+002 GWET

Sample Taken On                  : 5/11/2017   3:00:00 PM
Acquisition Started              : 6/2/2017   10:25:37 PM

Live Time                        :     7200.0 seconds
Real Time                        :     7201.9 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: NFB-A04-S003-1824-01
Peak Analysis Performed on: 6/3/2017 12:25:57 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	293-	316	300.17	74.90	1.08	2.40E+002	22.59	4.17E+002
m	2	293-	316	309.13	77.14	1.08	3.10E+002	24.15	3.81E+002
M	3	333-	353	336.46	83.98	0.61	6.03E+001	14.60	2.41E+002
m	4	333-	353	349.35	87.20	0.61	8.41E+001	16.81	3.02E+002
	5	364-	379	370.63	92.51	1.10	9.81E+001	40.81	5.21E+002
	6	735-	753	744.35	185.91	1.20	2.57E+002	40.19	4.02E+002
M	7	941-	976	954.88	238.53	1.09	7.67E+002	31.41	2.29E+002
m	8	941-	976	968.01	241.81	1.10	1.91E+002	18.33	2.30E+002
	9	1173-	1189	1180.87	295.01	1.10	3.90E+002	30.88	1.80E+002
	10	1309-	1317	1313.01	328.03	0.32	2.23E+001	15.37	9.87E+001
	11	1346-	1359	1353.46	338.14	1.29	1.51E+002	23.14	1.40E+002
	12	1399-	1419	1407.70	351.70	1.05	6.87E+002	37.04	1.88E+002
	13	1555-	1565	1560.69	389.93	0.32	1.37E+001	13.64	7.23E+001
	14	1843-	1859	1851.90	462.71	1.13	7.48E+001	17.34	7.23E+001
	15	2032-	2054	2042.67	510.39	1.80	2.86E+002	27.62	1.23E+002
	16	2244-	2255	2248.73	561.89	0.52	1.29E+001	12.34	5.41E+001
	17	2325-	2342	2332.66	582.86	1.48	2.95E+002	22.88	7.13E+001
	18	2430-	2445	2436.90	608.91	1.15	5.56E+002	28.13	7.78E+001
	19	2640-	2650	2645.14	660.96	0.68	2.04E+001	11.40	4.56E+001
	20	2901-	2916	2908.43	726.76	0.64	6.42E+001	15.62	5.98E+001
	21	3063-	3080	3073.44	768.00	0.43	7.85E+001	14.50	4.05E+001
	22	3434-	3447	3441.82	860.06	0.68	2.82E+001	12.01	4.08E+001
	23	3635-	3654	3644.31	910.67	1.17	1.92E+002	21.17	7.12E+001
	24	3868-	3887	3876.55	968.71	0.89	1.01E+002	15.61	4.00E+001
	25	4473-	4490	4481.53	1119.91	1.10	1.13E+002	15.13	3.56E+001
	26	4945-	4962	4953.84	1237.95	1.96	5.51E+001	11.71	2.49E+001
	27	5507-	5518	5512.47	1377.56	0.54	2.41E+001	7.84	1.49E+001
	28	5832-	5858	5845.51	1460.79	1.65	5.32E+002	24.91	2.03E+001
	29	6916-	6929	6922.64	1729.99	1.04	3.32E+001	7.21	6.79E+000
	30	7051-	7072	7062.73	1765.00	1.53	1.33E+002	13.19	1.09E+001

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

Errors quoted at 1.000 sigma

****
***** N U C L I D E M D A R E P O R T *****
****

Detector Name: ERT01
Sample Geometry:
Sample Title: NFB-A04-S003-1824-01
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	4.0156E-001	4.02E-001	3.9803E+000
	Co-60	1173.23	99.85	5.1167E-002	4.61E-002	-5.4025E-003
		1332.49	99.98	4.6116E-002		2.9906E-002
>		2505.71	0.10	0.0000E+000		0.0000E+000
+	Cs-137	32.06	5.54	2.7385E+003	2.72E-002	-5.6991E+002
		661.66*	84.99	2.7221E-002		1.0833E-002
+	Tl-208	72.80	2.02	4.7429E+000	3.77E-002	-4.0626E-001
		74.97*	3.41	1.7008E+000		2.9763E+000
		84.90*	1.51	2.2061E+000		1.2679E+000
		277.36	6.31	5.9252E-001		-1.6025E-001
		510.77*	22.60	2.1689E-001		2.0194E-001
		583.19*	84.50	3.7732E-002		1.4472E-001
		763.13	1.81	2.6771E+000		-4.8153E-001
		860.56*	12.42	2.3567E-001		1.2601E-001
+	Bi-212	39.86	1.06	5.1211E+002	4.73E-001	-6.5272E+001
		727.33*	6.74	4.7323E-001		4.6713E-001
		785.37	1.11	3.9354E+000		1.4119E+000
		1620.74	1.51	2.6339E+000		7.3463E-001
		1806.00	0.09	3.9138E+001		-2.1709E+001
+	Pb-212	74.81*	10.40	5.5766E-001	6.42E-002	9.7588E-001
		77.11*	17.50	2.9152E-001		6.8815E-001
		87.30*	7.81	4.4252E-001		3.1778E-001
		115.18	0.59	6.2573E+000		-2.4586E+000
		238.63*	43.30	6.4236E-002		4.5222E-001
		300.09	3.28	1.2129E+000		-5.9795E-002
+	Bi-214	76.86*	0.43	1.1713E+001	6.95E-002	2.7651E+001
		89.81	0.24	2.3438E+001		1.8395E+000
		386.77	0.30	1.2170E+001		7.0644E-001
		454.77	0.29	1.2857E+001		5.2429E+000
		609.31*	45.49	6.9484E-002		5.2233E-001
		665.45	1.53	2.7714E+000		6.0907E-001
		703.11	0.48	8.3528E+000		2.7281E+000
		719.86	0.39	1.0159E+001		2.5396E-001
		768.36*	4.89	5.7143E-001		8.0015E-001
		786.10	0.31	1.3798E+001		5.1927E+000
		806.17	1.26	3.5155E+000		1.9677E+000
		934.06	3.10	1.5278E+000		1.1652E+000
		964.08	0.36	1.6699E+001		3.4602E+000
		1051.96	0.31	1.4290E+001		3.0355E+000
		1120.29*	14.91	2.3648E-001		5.0938E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	1.9652E+001	6.95E-002	-4.0916E+000
		1155.19	1.63	2.9691E+000		1.5731E+000
		1207.68	0.45	1.2382E+001		6.7713E+000
		1238.11*	5.79	5.6184E-001		6.8957E-001
		1280.96	1.43	3.4608E+000		2.6065E+000
		1377.67*	4.00	6.1071E-001		4.7404E-001
		1385.31	0.76	6.0549E+000		-3.1711E+000
		1401.50	1.27	3.7594E+000		1.9098E+000
		1407.98	2.15	2.2268E+000		-8.8086E-002
		1509.23	2.11	2.2516E+000		5.3588E-001
		1538.50	0.38	1.1153E+001		-2.3773E+000
		1543.32	0.20	2.0995E+001		1.9149E+001
		1583.22	0.69	7.1754E+000		2.8117E+000
		1594.73	0.25	2.2165E+001		1.6656E+001
		1599.31	0.23	1.9124E+001		5.4300E-001
		1661.28	1.15	3.9282E+000		2.0877E+000
		1683.99	0.22	1.6786E+001		8.0753E+000
		1729.59*	2.92	6.9746E-001		1.0145E+000
		1764.49*	15.40	2.0374E-001		7.4569E-001
		1847.42	2.11	1.9507E+000		5.1898E-001
		1873.16	0.22	1.7067E+001		7.3361E-002
>		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	2.6769E+001	1.06E-001	9.0117E+000
		74.81*	6.44	8.8086E-001		1.5415E+000
		77.11*	10.80	4.6203E-001		1.0907E+000
		87.30*	4.84	6.9844E-001		5.0156E-001
		242.00*	7.43	3.5731E-001		6.6531E-001
		258.87	0.52	7.1183E+000		1.9910E+000
		274.80	0.47	8.0115E+000		-3.1685E+000
		295.22*	19.30	1.6880E-001		5.8155E-001
		351.93*	37.60	1.0571E-001		5.7117E-001
		462.00*	0.22	1.1981E+001		1.2339E+001
		533.66	0.19	1.9915E+001		-8.8849E+000
		785.96	1.07	3.9952E+000		1.5035E+000
		839.04	0.59	7.1758E+000		-5.5091E-001
+	Ra-224	81.07	0.13	4.8124E+001	6.62E-001	-1.6413E+001
		83.78*	0.22	1.5351E+001		8.8228E+000
		240.99*	4.10	6.6200E-001		1.2326E+000
+	Ra-226	81.07	0.20	3.1301E+001	1.13E+000	-1.0675E+001
		83.78*	0.33	9.9337E+000		5.7093E+000
		94.90	0.15	3.3362E+001		-9.4243E+000
		186.21*	3.59	1.1301E+000		1.3086E+000
	Ac-228	99.50	1.26	3.4075E+000	2.74E-001	2.1298E+000
		129.07	2.50	1.6205E+000		5.5092E-002
		209.25	3.97	1.0373E+000		7.1172E-001
		270.24	3.55	1.1535E+000		6.9293E-001
		328.00	3.04	1.3385E+000		6.8917E-001
		338.32	11.40	4.1524E-001		5.0217E-001
		409.46	2.02	1.7912E+000		-7.7374E-001

Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
Ac-228	463.00	4.45	8.8888E-001	2.74E-001	7.8625E-002
	755.31	1.03	4.1362E+000		1.0000E+000
	772.29	1.52	3.1444E+000		-2.0073E+000
	794.94	4.31	1.0225E+000		2.9812E-001
	835.70	1.70	2.4694E+000		-1.5769E+000
	911.20	26.20	2.7433E-001		4.6905E-001
	964.79	4.99	1.2507E+000		3.0828E-001
	968.96	15.90	3.9145E-001		7.3897E-001
	1588.20	3.06	1.9836E+000		2.1091E+000
	1630.62	1.52	2.5000E+000		-3.3934E-001
Th-228	84.37*	1.26	2.6438E+000	2.64E+000	1.5195E+000
	131.61	0.13	3.0697E+001		1.1522E+001
	166.41	0.10	3.6756E+001		7.5957E+000
	215.98	0.25	1.4866E+001		1.8371E+000
Pa-234m	258.23	0.07	5.0711E+001	4.70E+000	2.3641E+001
	742.81	0.09	3.9490E+001		7.3557E-002
	766.36	0.32	1.4647E+001		8.1952E+000
	786.27	0.05	7.8520E+001		2.0077E+001
	1001.03	0.85	4.6969E+000		9.5663E-001
	1737.77	0.02	1.8710E+002		-2.2604E+002
Th-234	63.30	3.75	3.6594E+000	1.22E+000	2.8270E+000
	92.59	4.33	1.2203E+000		7.6218E-001
	112.81	0.22	1.7282E+001		1.0167E-001

+ = 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: NFB-A04-S003-1824-01
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	1.000	1460.82*		10.55	3.98034E+000	2.21793E-001
Cs-137	0.927	32.06	@	5.54		
		661.66*		84.99	1.08333E-002	6.04819E-003
Tm-170	0.987	84.25*		2.48	8.52395E-001	2.10226E-001
Tl-208	0.847	72.80	@	2.02		
		74.97*	@	3.41	2.97629E+000	2.94320E-001
		84.90*	@	1.51	1.26791E+000	3.09298E-001
		277.36		6.31		
		510.77*	@	22.60	2.01940E-001	4.97510E-002
		583.19*		84.50	1.44721E-001	1.24206E-002
		763.13	@	1.81		
		860.56*		12.42	1.26014E-001	5.37017E-002
Bi-211	0.931	351.03*		13.00	1.65516E+000	1.08400E-001
Bi-212	0.548	39.86	@	1.06		
		727.33*		6.74	4.67125E-001	1.14553E-001
		785.37		1.11		
		1620.74		1.51		
		1806.00	@	0.09		
Pb-212	0.921	74.81*		10.40	9.75881E-001	1.00525E-001
		77.11*		17.50	6.88154E-001	6.07178E-002
		87.30*		7.81	3.17776E-001	6.49292E-002
		115.18	@	0.59		
		238.63*		43.30	4.52219E-001	2.42699E-002
		300.09		3.28		
Bi-214	0.691	76.86*	@	0.43	2.76507E+001	2.45764E+000
		89.81	@	0.24		
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	5.22329E-001	3.05864E-002
		665.45	@	1.53		
		703.11	@	0.48		
		719.86	@	0.39		
		768.36*		4.89	8.00151E-001	1.49079E-001
		786.10	@	0.31		
		806.17	@	1.26		
		934.06		3.10		
		964.08	@	0.36		
		1051.96	@	0.31		
		1120.29*		14.91	5.09377E-001	6.90462E-002
		1133.66	@	0.25		
		1155.19	@	1.63		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.691	1207.68	@	0.45		
		1238.11*		5.79	6.89565E-001	1.48033E-001
		1280.96	@	1.43		
		1377.67*		4.00	4.74035E-001	1.54516E-001
		1385.31	@	0.76		
		1401.50	@	1.27		
		1407.98	@	2.15		
		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	1.01445E+000	2.22739E-001
		1764.49*		15.40	7.45694E-001	8.16716E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.940	53.28	@	1.20		
		74.81*		6.44	1.54148E+000	1.60507E-001
		77.11*		10.80	1.09067E+000	9.96064E-002
		87.30*		4.84	5.01556E-001	1.02919E-001
		242.00*		7.43	6.65312E-001	6.79755E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	5.81548E-001	5.01495E-002
		351.93*		37.60	5.71167E-001	3.69663E-002
		462.00*	@	0.22	1.23390E+001	2.93340E+000
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.862	81.07	@	0.13		
		83.78*	@	0.22	8.82275E+000	2.17670E+000
		240.99*		4.10	1.23264E+000	1.25515E-001
Ra-226	0.871	81.07	@	0.20		
		83.78*	@	0.33	5.70930E+000	1.40833E+000
		94.90	@	0.15		
		186.21*		3.59	1.30862E+000	2.59857E-001

* = Energy line found in the spectrum.
@ = Energy line not used for Weighted Mean Activity
Energy Tolerance : 1.000 keV
Nuclide confidence index threshold = 0.45
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		1.000	3.980338E+000	2.217926E-001
X	Cd-109		0.894		
	Cs-137	@	0.927	1.083329E-002	6.048189E-003
	Tm-170		0.987	5.231030E-001	2.121267E-001
	Tl-208	@	0.847	1.449426E-001	1.203812E-002
	Bi-211		0.931	3.176672E-001	1.590965E-001
	Bi-212	@	0.548	4.671252E-001	1.145531E-001
	Pb-212	@	0.921	4.085359E-001	2.158593E-002
	Bi-214	@	0.691	5.536832E-001	2.524423E-002
	Pb-214	@	0.940	4.615459E-001	4.104357E-002
	Ra-224	@	0.862	3.775239E-001	1.459809E-001
	Ra-226	@	0.871	1.308616E+000	2.589353E-001
X	Th-228		0.485		
X	Th-231		0.631		

? = 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: 6/3/2017 12:25:57 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
5	92.51	3.0741E-003	186.32	Tol.	Th-234
10	328.03	3.0906E-003	69.06	Sum	
11	338.14	2.1034E-002	15.28	Tol.	Ra-223 Ac-228
13	389.93	1.9077E-003	99.31		
16	561.89	1.7853E-003	95.99		
23	910.67	2.5908E-002	11.40	Tol.	Ac-228
24	968.71	1.4028E-002	15.46	Sum	

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

Errors quoted at 1.000 sigma