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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: ERT01,C:\GENIE2K\CAMFILES\SMP-NFB-WAREHOUSE-BAG NO.13.CNF

Report Generated On	: 7/20/2017 2:11:25 PM
Sample Title	: NFB-WAREHOUSE-BAG NO.13
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	: 8.851E+002 GWET
Sample Taken On	: 12/7/2016 12:00:00 PM
Acquisition Started	: 7/20/2017 12:11:21 PM
Live Time	: 7200.0 seconds
Real Time	: 7202.1 seconds
Dead Time	: 0.03 %

Energy Calibration Used Done On	: 5/10/2017
Efficiency Calibration Used Done On	: 12/14/2016
Efficiency ID	: ERT0101

****
***** 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-WAREHOUSE-BAG NO.13
Peak Analysis Performed on: 7/20/2017 2:11:25 PM
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	295-	315	300.37	74.96	0.92	2.86E+002	26.30	5.61E+002
m	2	295-	315	309.43	77.22	0.92	4.57E+002	29.93	5.44E+002
M	3	343-	384	350.66	87.52	1.43	2.28E+002	26.78	7.22E+002
m	4	343-	384	361.28	90.18	1.43	1.68E+002	24.41	7.24E+002
m	5	343-	384	372.46	92.97	1.44	3.77E+002	29.45	7.09E+002
	6	739-	754	744.80	186.02	1.03	3.16E+002	44.23	5.41E+002
	7	832-	843	837.91	209.30	0.93	1.23E+002	31.48	3.46E+002
M	8	948-	978	955.24	238.62	1.10	1.38E+003	41.19	3.53E+002
m	9	948-	978	967.66	241.72	1.11	3.00E+002	22.28	3.16E+002
	10	1074-	1093	1081.29	270.12	0.99	1.17E+002	37.16	3.61E+002
M	11	1175-	1208	1181.49	295.16	1.04	5.88E+002	28.11	2.06E+002
m	12	1175-	1208	1200.50	299.91	1.05	8.12E+001	14.08	1.87E+002
	13	1309-	1317	1312.94	328.01	0.56	7.72E+001	19.36	1.39E+002
	14	1347-	1362	1353.99	338.28	1.14	2.69E+002	31.08	2.31E+002
	15	1402-	1416	1408.13	351.81	1.27	1.04E+003	38.58	1.56E+002
	16	1429-	1438	1433.76	358.21	0.47	2.50E+001	16.03	1.02E+002
	17	1846-	1858	1852.55	462.87	0.71	5.38E+001	20.10	1.33E+002
	18	2029-	2058	2043.77	510.66	1.62	4.31E+002	37.07	1.99E+002
	19	2323-	2341	2333.47	583.07	1.25	5.16E+002	30.86	1.29E+002
	20	2431-	2447	2437.94	609.17	1.21	7.99E+002	33.52	1.02E+002
	21	2638-	2657	2647.27	661.49	0.99	1.46E+002	23.01	1.08E+002
	22	2902-	2919	2910.85	727.36	0.80	1.08E+002	20.94	9.86E+001
	23	3066-	3083	3074.46	768.25	1.33	6.82E+001	18.93	8.88E+001
	24	3174-	3188	3180.70	794.80	0.41	3.59E+001	15.32	6.91E+001
	25	3336-	3351	3343.38	835.46	0.32	3.89E+001	15.22	6.41E+001
	26	3436-	3451	3443.20	860.41	0.46	4.37E+001	15.51	6.53E+001
	27	3636-	3657	3646.46	911.21	1.45	3.78E+002	25.03	6.69E+001
M	28	3853-	3887	3861.04	964.84	1.43	7.32E+001	11.30	7.24E+001
m	29	3853-	3887	3877.81	969.03	1.43	2.05E+002	16.29	6.55E+001
	30	4473-	4494	4483.71	1120.45	1.66	2.06E+002	21.19	6.50E+001
	31	4946-	4961	4955.07	1238.25	0.40	6.49E+001	15.47	5.81E+001
	32	5834-	5859	5847.96	1461.41	1.78	1.22E+003	36.76	3.18E+001
	33	6368-	6381	6374.67	1593.04	0.95	1.93E+001	9.04	2.27E+001
	34	6482-	6495	6488.54	1621.50	0.90	1.87E+001	7.46	1.23E+001
	35	6917-	6930	6923.29	1730.15	0.25	2.52E+001	8.13	1.28E+001
	36	7054-	7075	7064.45	1765.43	1.50	1.67E+002	14.42	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

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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: NFB-WAREHOUSE-BAG NO.13
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	4.2996E-001	4.30E-001	8.4860E+000
	Co-60	1173.23	99.85	6.1918E-002	5.19E-002	1.6370E-002
		1332.49	99.98	5.1922E-002		1.4180E-002
>		2505.71	0.10	0.0000E+000		0.0000E+000
+	Cs-137	32.06	5.54	3.0096E+003	4.59E-002	-1.6109E+003
		661.66*	84.99	4.5915E-002		7.1431E-002
+	Tl-208	72.80	2.02	6.5915E+000	5.68E-002	1.7943E+000
		74.97*	3.41	2.1875E+000		3.9439E+000
		84.90	1.51	5.4925E+000		9.6268E-001
		277.36	6.31	8.7075E-001		7.3506E-001
		510.77*	22.60	3.1176E-001		5.0807E-001
		583.19*	84.50	5.6801E-002		2.8592E-001
		763.13	1.81	3.3815E+000		-1.1298E+000
		860.56*	12.42	3.3830E-001		2.1766E-001
+	Bi-212	39.86	1.06	6.7295E+002	7.08E-001	5.1382E+001
		727.33*	6.74	7.0776E-001		8.7967E-001
		785.37	1.11	5.5859E+000		1.5947E+000
		1620.74*	1.51	2.0302E+000		1.2240E+000
		1806.00	0.09	4.2945E+001		1.0560E+001
+	Pb-212	74.81*	10.40	7.1724E-001	8.74E-002	1.2931E+000
		77.11*	17.50	3.8588E-001		1.1294E+000
		87.30*	7.81	7.5148E-001		9.5282E-001
		115.18	0.59	8.5965E+000		6.6418E+000
		238.63*	43.30	8.7450E-002		9.1742E-001
		300.09*	3.28	9.3544E-001		8.1992E-001
+	Bi-214	76.86*	0.43	1.2682E+001	7.41E-002	3.7117E+001
		89.81*	0.24	1.8313E+001		1.7173E+001
		386.77	0.30	1.4078E+001		1.6224E+001
		454.77	0.29	1.3630E+001		-3.4922E-001
		609.31*	45.49	7.4071E-002		6.8434E-001
		665.45	1.53	3.5585E+000		3.8592E-001
		703.11	0.48	9.4475E+000		1.0669E+000
		719.86	0.39	1.0637E+001		-8.9264E+000
		768.36*	4.89	7.6172E-001		6.3412E-001
		786.10	0.31	1.5864E+001		-5.2128E-001
		806.17	1.26	3.6165E+000		-9.2880E-001
		934.06	3.10	1.6128E+000		4.1479E-001
		964.08*	0.36	8.7455E+000		1.0917E+001
		1051.96	0.31	1.5971E+001		5.5104E+000
		1120.29*	14.91	3.0818E-001		8.4391E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	2.0915E+001	7.41E-002	3.9734E-001
		1155.19	1.63	3.7441E+000		4.3815E-001
		1207.68	0.45	1.3695E+001		5.2375E+000
		1238.11*	5.79	7.3279E-001		7.4225E-001
		1280.96	1.43	3.9027E+000		3.0099E+000
		1377.67	4.00	1.3443E+000		3.8478E-001
		1385.31	0.76	6.6612E+000		-9.0137E+000
		1401.50	1.27	4.2523E+000		-8.6530E-001
		1407.98	2.15	2.5792E+000		3.2344E-001
		1509.23	2.11	2.1928E+000		-8.9638E-001
		1538.50	0.38	1.1904E+001		-9.4042E-001
		1543.32	0.20	2.1170E+001		-1.7427E+000
		1583.22	0.69	8.0199E+000		5.5599E+000
		1594.73	0.25	2.3655E+001		1.0439E+001
		1599.31	0.23	2.2013E+001		-7.6859E+000
		1661.28	1.15	3.1196E+000		4.0406E-001
		1683.99	0.22	1.6906E+001		2.5887E+000
		1729.59*	2.92	9.0404E-001		7.0352E-001
		1764.49*	15.40	1.8601E-001		8.6066E-001
		1847.42	2.11	1.8573E+000		-2.1335E-001
		1873.16	0.22	1.5353E+001		1.2514E+001
>		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	3.0350E+001	7.92E-002	1.2736E+001
		74.81*	6.44	9.2665E-001		1.6707E+000
		77.11*	10.80	5.0023E-001		1.4641E+000
		87.30*	4.84	9.7012E-001		1.2300E+000
		242.00*	7.43	3.8041E-001		9.5507E-001
		258.87	0.52	7.5039E+000		-3.0600E-001
		274.80	0.47	9.4524E+000		5.8904E+000
		295.22*	19.30	1.3201E-001		8.0040E-001
		351.93*	37.60	7.9239E-002		7.8895E-001
		462.00*	0.22	1.3516E+001		8.0935E+000
		533.66	0.19	2.0696E+001		6.4003E+000
		785.96	1.07	4.5933E+000		-1.5093E-001
		839.04	0.59	8.5113E+000		7.2087E+000
+	Ra-224	81.07	0.13	6.4825E+001	8.62E-001	-3.4962E+001
		83.78	0.22	3.6839E+001		1.1305E+001
		240.99*	4.10	8.6170E-001		2.1634E+000
+	Ra-226	81.07	0.20	3.4486E+001	1.13E+000	-1.8600E+001
		83.78	0.33	1.9498E+001		5.9835E+000
		94.90	0.15	3.7383E+001		-1.0504E+000
		186.21*	3.59	1.1261E+000		1.5371E+000
+	Ac-228	99.50	1.26	4.4762E+000	1.91E-001	1.0597E+000
		129.07	2.50	2.1313E+000		-6.2891E-002
		209.25*	3.97	9.6329E-001		8.4807E-001
		270.24*	3.55	1.4826E+000		1.0359E+000
		328.00*	3.04	9.4693E-001		8.8226E-001
		338.32*	11.40	3.8839E-001		8.3212E-001
		409.46	2.02	2.5836E+000		1.3913E+000

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Ac-228	463.00*	4.45	8.3890E-001	1.91E-001	5.0235E-001
		755.31	1.03	5.6917E+000		4.5660E+000
		772.29	1.52	4.1904E+000		9.2500E-001
		794.94*	4.31	9.2310E-001		4.8512E-001
		835.70*	1.70	2.3943E+000		1.3839E+000
		911.20*	26.20	1.9099E-001		9.2017E-001
		964.79*	4.99	7.9512E-001		9.9258E-001
		968.96*	15.90	2.3881E-001		8.7469E-001
		1588.20	3.06	2.5498E+000		2.5941E+000
		1630.62	1.52	3.2722E+000		-1.7486E+000
	Th-228	84.37	1.26	6.4849E+000	6.48E+000	1.7405E+000
		131.61	0.13	4.0490E+001		3.5570E+000
		166.41	0.10	4.8796E+001		-3.4498E+000
		215.98	0.25	2.0734E+001		-8.2460E+000
	Pa-234m	258.23	0.07	5.3384E+001	5.26E+000	-1.6517E+001
		742.81	0.09	4.6193E+001		2.1283E+001
		766.36	0.32	1.5713E+001		9.3275E+000
		786.27	0.05	9.1707E+001		1.2897E+001
		1001.03	0.85	5.2617E+000		-1.7931E+000
		1737.77	0.02	1.9259E+002		-1.6875E+002
	Th-234	63.30	3.75	4.0356E+000	1.43E+000	9.7036E-001
		92.59	4.33	1.4260E+000		2.4938E+000
		112.81	0.22	1.9344E+001		8.7218E+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: NFB-WAREHOUSE-BAG NO.13
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	0.947	1460.82*		10.55	8.48601E+000	3.47584E-001
Mn-54	0.937	834.84*		99.97	3.10269E-002	1.21669E-002
Cs-137	0.994	32.06	@	5.54		
		661.66*		84.99	7.14311E-002	1.14377E-002
Eu-152m	0.983	89.85*		69.90	6.18498E-002	9.12434E-003
Tl-208	0.843	72.80	@	2.02		
		74.97*	@	3.41	3.94388E+000	3.82209E-001
		84.90	@	1.51		
		277.36		6.31		
		510.77*	@	22.60	5.08074E-001	7.47963E-002
		583.19*		84.50	2.85915E-001	1.95209E-002
		763.13	@	1.81		
		860.56*		12.42	2.17660E-001	7.74038E-002
TL-208e	0.959	1592.53*		99.16	1.91211E-002	9.01636E-003
Bi-211	0.908	351.03*		13.00	2.32647E+000	1.21240E-001
Bi-212	0.764	39.86	@	1.06		
		727.33*		6.74	8.79672E-001	1.72166E-001
		785.37		1.11		
		1620.74*		1.51	1.22401E+000	4.90507E-001
		1806.00	@	0.09		
Pb-212	0.984	74.81*		10.40	1.29314E+000	1.30754E-001
		77.11*		17.50	1.12939E+000	8.74203E-002
		87.30*		7.81	9.52819E-001	1.19025E-001
		115.18	@	0.59		
		238.63*		43.30	9.17422E-001	4.11622E-002
		300.09*		3.28	8.19924E-001	1.44838E-001
Bi-214	0.654	76.86*	@	0.43	3.71170E+001	2.90046E+000
		89.81*	@	0.24	1.71728E+001	2.60723E+000
		386.77	@	0.30		
		454.77	@	0.29		
		609.31*		45.49	6.84341E-001	3.51029E-002
		665.45	@	1.53		
		703.11	@	0.48		
		719.86	@	0.39		
		768.36*		4.89	6.34117E-001	1.76718E-001
		786.10	@	0.31		
		806.17	@	1.26		
		934.06		3.10		
		964.08*	@	0.36	1.09173E+001	1.74112E+000
		1051.96	@	0.31		
		1120.29*		14.91	8.43911E-001	8.92193E-002

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.654	1133.66	@	0.25		
		1155.19	@	1.63		
		1207.68	@	0.45		
		1238.11*		5.79	7.42249E-001	1.78085E-001
		1280.96	@	1.43		
		1377.67		4.00		
		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	7.03517E-001	2.27833E-001
		1764.49*		15.40	8.60662E-001	8.28011E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.943	53.28	@	1.20		
		74.81*		6.44	1.67069E+000	1.70829E-001
		77.11*		10.80	1.46406E+000	1.18462E-001
		87.30*		4.84	1.23004E+000	1.55410E-001
		242.00*		7.43	9.55072E-001	7.82898E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	8.00397E-001	4.69681E-002
		351.93*		37.60	7.88952E-001	4.03476E-002
		462.00*	@	0.22	8.09349E+000	3.05670E+000
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.809	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	2.16341E+000	1.76409E-001
Ra-226	0.772	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	1.53710E+000	2.61941E-001
Ac-228	0.767	99.50	@	1.26		
		129.07	@	2.50		
		209.25*		3.97	8.48075E-001	2.20372E-001
		270.24*		3.55	1.03591E+000	3.30904E-001
		328.00*		3.04	8.82259E-001	2.25248E-001
		338.32*		11.40	8.32118E-001	1.04188E-001
		409.46	@	2.02		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Ac-228	0.767	463.00*		4.45	5.02354E-001	1.90556E-001
		755.31	@	1.03		
		772.29	@	1.52		
		794.94*		4.31	4.85119E-001	2.08048E-001
		835.70*	@	1.70	1.38385E+000	5.45648E-001
		911.20*		26.20	9.20165E-001	7.12117E-002
		964.79*		4.99	9.92577E-001	1.58509E-001
		968.96*		15.90	8.74689E-001	7.74268E-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

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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 *****
****

	Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/GWET)	Wt mean Activity Uncertainty
	K-40		0.947	8.486007E+000	3.475835E-001
	Mn-54		0.937	1.178827E-002	1.219777E-002
X	Cd-109		0.958		
	Cs-137	@	0.994	7.143106E-002	1.143767E-002
	Eu-152m		0.983	5.924255E-002	9.109498E-003
	Tl-208	@	0.843	2.809236E-001	1.877593E-002
	TL-208e		0.959	1.912107E-002	9.016357E-003
	Bi-211		0.908	3.152059E-001	1.682652E-001
	Bi-212	@	0.764	9.174404E-001	1.624495E-001
	Pb-212	@	0.984	8.039070E-001	3.378536E-002
	Bi-214	@	0.654	7.239183E-001	2.942077E-002
	Pb-214	@	0.943	6.820598E-001	4.121414E-002
	Ra-224	@	0.809	6.184222E-001	1.978368E-001
	Ra-226	@	0.772	1.537102E+000	2.619407E-001
	Ac-228	@	0.767	8.580772E-001	3.870029E-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: 7/20/2017 2:11:25 PM
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
m 5	92.97	4.1810E-002	9.98	Tol.	Yb-169 Th-227 Th-234
16	358.21	3.4678E-003	64.20	Sum	

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

Errors quoted at 1.000 sigma