Date: _____

9626 Niagara Falls Blvd Onsite Gamma Spec Screening Lab

Gamma Spectroscopy Detector work sheet.

Counted by (Initial,date)	Geometry Description	Analysis Number/Sample ID/Remarks	Sample Collection mmddyy hh:mm	Sample Quantity	Sample Units (GWET,GDRY,L, ft^3, etc)	Count Time (s)	Report Matches Sample Parameters (Initial, date)
cc/121516	450 cc SOIL	A5-CS009-0006-01	12-8-16 1425	741.3	GWET	7200	
cc/121616	450 cc SOIL	A5-CS010-0006-01	12-8-16 1430	840.6	GWET	7200	
cc/121616	450 cc SOIL	A5-CS011-0006-01	12-8-16 1435	799.7	GWET	7200	
cc/121616	450 cc SOIL	A5-CS012-0006-01	12-8-16 1440	883.6	GWET	7200	
cc/121616	450 cc SOIL	A5-CS014-0006-01	12-13-16 0910	754.7	GWET	7200	
cc/121616	450 cc SOIL	LCP-01	12-15-16 1430	644.3	GWET	7200	
cc/121916	450 cc SOIL	LCP-02	12-15-16 1435	633.3	GWET	7200	
cc/121916	450 cc SOIL	LCP-03	12-15-16 1440	646.9	GWET	7200	
cc/121916	450 cc SOIL	LCP-04	12-15-16 1445	604.0	GWET	7200	
cc/121916	450 cc SOIL	LCP-05	12-15-16 1450	826.6	GWET	7200	

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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-A5-CS014-0006-01.CNF

Report Generated On	: 12/16/2016 5:23:47 PM
Sample Title	: A5-CS014-0006-01
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	: 7.547E+002 GWET
Sample Taken On	: 12/13/2016 9:10:00 AM
Acquisition Started	: 12/16/2016 3:23:42 PM
Live Time	: 7200.0 seconds
Real Time	: 7202.8 seconds
Dead Time	: 0.04 %

Energy Calibration Used Done On	: 12/10/2016
Efficiency Calibration Used Done On	: 9/27/2016
Efficiency ID	: ERT0101

****
***** P E A K A N A L Y S I S R E P O R T *****
****

Detector Name: ERT01
Sample Title: A5-CS014-0006-01
Peak Analysis Performed on: 12/16/2016 5:23:47 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	292-	315	299.62	74.93	0.90	2.26E+002	23.45	5.30E+002
m	2	292-	315	309.12	77.31	0.91	4.13E+002	28.70	5.13E+002
	3	346-	354	349.49	87.40	0.65	8.04E+001	31.12	4.11E+002
	4	512-	520	516.45	129.14	0.71	5.35E+001	26.69	3.07E+002
	5	738-	751	744.09	186.05	1.40	2.72E+002	36.20	3.77E+002
	6	830-	844	837.98	209.53	1.50	1.39E+002	33.12	3.31E+002
M	7	945-	975	954.47	238.65	1.11	1.40E+003	40.83	3.02E+002
m	8	945-	975	967.10	241.81	1.11	2.19E+002	19.25	2.47E+002
	9	1075-	1090	1081.06	270.30	0.63	1.06E+002	29.28	2.48E+002
	10	1173-	1190	1180.46	295.15	1.10	3.85E+002	34.71	2.47E+002
	11	1195-	1206	1200.40	300.14	0.82	7.15E+001	22.40	1.72E+002
	12	1343-	1359	1352.82	338.24	1.24	2.57E+002	31.53	2.34E+002
	13	1399-	1415	1407.18	351.83	1.02	6.26E+002	34.69	1.85E+002
	14	1845-	1856	1850.94	462.78	0.93	7.53E+001	17.69	9.37E+001
	15	2031-	2055	2041.34	510.38	2.22	3.18E+002	31.01	1.56E+002
	16	2324-	2343	2331.73	582.98	1.37	4.84E+002	30.57	1.25E+002
	17	2428-	2447	2436.19	609.10	1.57	5.60E+002	31.64	1.23E+002
	18	2901-	2914	2907.66	726.97	1.22	9.62E+001	17.14	7.08E+001
	19	2963-	2972	2967.12	741.83	0.35	1.86E+000	10.56	4.71E+001
	20	3014-	3023	3018.26	754.62	0.81	1.05E+001	10.20	4.05E+001
M	21	3067-	3093	3071.54	767.94	1.04	5.01E+001	10.07	5.43E+001
m	22	3067-	3093	3088.18	772.10	1.05	2.44E+001	7.34	4.30E+001
	23	3176-	3188	3180.24	795.12	1.17	4.64E+001	13.70	5.16E+001
	24	3434-	3450	3439.98	860.05	0.57	5.35E+001	15.88	6.35E+001
	25	3634-	3654	3643.29	910.88	1.50	3.50E+002	25.65	8.31E+001
	26	3867-	3883	3874.54	968.70	1.61	2.05E+002	19.78	5.98E+001
	27	4472-	4487	4479.75	1120.01	1.04	1.09E+002	17.71	6.81E+001
	28	5505-	5517	5511.24	1377.89	0.26	2.41E+001	8.43	1.79E+001
	29	5832-	5856	5843.42	1460.94	1.88	1.77E+003	43.52	3.07E+001
	30	7050-	7069	7060.14	1765.13	1.73	1.12E+002	11.36	4.86E+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 *****
****

Detector Name: ERT01
Sample Geometry:
Sample Title: A5-CS014-0006-01
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	4.8312E-001	4.83E-001	1.4227E+001
	Co-60	1173.23	99.85	6.7866E-002	5.73E-002	-1.3837E-002
		1332.49	99.98	5.7269E-002		-6.2616E-003
>		2505.71	0.10	0.0000E+000		0.0000E+000
	Cs-137	32.06	5.54	8.0878E+002	6.17E-002	-4.7502E+002
		661.66	84.99	6.1673E-002		4.6343E-002
+	Tl-208	72.80	2.02	5.8181E+000	5.54E-002	1.9832E-001
		74.97*	3.41	2.0504E+000		3.0105E+000
		84.90	1.51	4.7135E+000		-1.7656E+000
		277.36	6.31	6.5798E-001		3.9329E-001
		510.77*	22.60	2.5327E-001		2.7092E-001
		583.19*	84.50	5.5385E-002		2.5705E-001
		763.13	1.81	3.1816E+000		-1.1869E+000
		860.56*	12.42	3.2942E-001		2.5841E-001
+	Bi-212	39.86	1.06	4.2446E+002	5.38E-001	1.8774E+002
		727.33*	6.74	5.3833E-001		7.6132E-001
		785.37	1.11	4.6245E+000		1.1743E+000
		1620.74	1.51	2.9871E+000		2.1602E+000
		1806.00	0.09	3.5737E+001		7.5380E+000
+	Pb-212	74.81*	10.40	6.7229E-001	6.97E-002	9.8711E-001
		77.11*	17.50	3.5356E-001		9.6403E-001
		87.30*	7.81	5.3108E-001		3.0239E-001
		115.18	0.59	7.5540E+000		1.8265E+000
		238.63*	43.30	6.9748E-002		7.9809E-001
		300.09*	3.28	8.6399E-001		6.2288E-001
+	Bi-214	76.86*	0.43	1.4477E+001	1.03E-001	3.9474E+001
		89.81	0.24	2.7649E+001		-2.1932E+001
		386.77	0.30	1.4011E+001		5.5534E+000
		454.77	0.29	1.3814E+001		-5.5692E+000
		609.31*	45.49	1.0330E-001		5.7663E-001
		665.45	1.53	3.2338E+000		5.8042E-001
		703.11	0.48	1.1124E+001		-2.1356E+000
		719.86	0.39	1.2665E+001		-8.0891E-001
		768.36*	4.89	5.7782E-001		5.6555E-001
		786.10	0.31	1.6736E+001		9.6438E+000
		806.17	1.26	4.2382E+000		4.1749E+000
		934.06	3.10	1.7580E+000		1.1314E+000
		964.08	0.36	2.4595E+001		4.0994E+000
		1051.96	0.31	1.9094E+001		1.4616E+001
		1120.29*	14.91	3.3218E-001		5.2274E-001

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Bi-214	1133.66	0.25	2.3874E+001	1.03E-001	7.1009E-002
		1155.19	1.63	4.1506E+000		2.8402E+000
		1207.68	0.45	1.6133E+001		-2.2522E+000
		1238.11	5.79	1.3916E+000		1.1054E+000
		1280.96	1.43	4.5325E+000		3.2250E+000
		1377.67*	4.00	7.1148E-001		4.9721E-001
		1385.31	0.76	6.3038E+000		-9.2729E-001
		1401.50	1.27	3.9143E+000		3.4994E-003
		1407.98	2.15	2.3921E+000		-1.2271E-001
		1509.23	2.11	2.2477E+000		8.9374E-001
		1538.50	0.38	1.1186E+001		1.4263E+000
		1543.32	0.20	2.1503E+001		3.6752E+000
		1583.22	0.69	8.2327E+000		5.1082E+000
		1594.73	0.25	2.1621E+001		4.0096E+000
		1599.31	0.23	1.8794E+001		-1.5534E+001
		1661.28	1.15	3.8227E+000		9.5791E-001
		1683.99	0.22	1.8748E+001		5.2999E+000
		1729.59	2.92	1.5007E+000		-5.2065E-001
		1764.49*	15.40	1.6304E-001		6.8090E-001
		1847.42	2.11	2.2293E+000		1.1058E+000
		1873.16	0.22	2.0754E+001		8.1134E+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	3.6813E+001	9.75E-002	1.9295E+000
		74.81*	6.44	1.0822E+000		1.5889E+000
		77.11*	10.80	5.7105E-001		1.5570E+000
		87.30*	4.84	8.5420E-001		4.8638E-001
		242.00*	7.43	3.5977E-001		7.4318E-001
		258.87	0.52	7.8717E+000		4.8391E+000
		274.80	0.47	8.5513E+000		-4.2577E-001
		295.22*	19.30	1.9843E-001		5.6285E-001
		351.93*	37.60	9.7522E-002		5.2083E-001
		462.00*	0.22	1.2918E+001		1.3081E+001
		533.66	0.19	2.3977E+001		-1.0824E+001
		785.96	1.07	4.8481E+000		2.7913E+000
		839.04	0.59	9.8780E+000		2.1098E+000
+	Ra-224	81.07	0.13	5.6747E+001	6.54E-001	-4.0061E+001
		83.78	0.22	3.1928E+001		-1.1891E+001
		240.99*	4.10	6.5409E-001		1.3511E+000
+	Ra-226	81.07	0.20	3.7614E+001	1.00E+000	-2.6554E+001
		83.78	0.33	2.1055E+001		-7.8415E+000
		94.90	0.15	3.8698E+001		3.8602E+001
		186.21*	3.59	1.0021E+000		1.4105E+000
+	Ac-228	99.50	1.26	3.6942E+000	2.04E-001	6.8946E-001
		129.07*	2.50	1.1127E+000		4.8778E-001
		209.25*	3.97	8.7683E-001		8.2946E-001
		270.24*	3.55	9.8461E-001		7.9886E-001
		328.00	3.04	1.4489E+000		5.1641E-001
		338.32*	11.40	3.4938E-001		6.9492E-001
		409.46	2.02	2.2125E+000		1.4254E+000

	Nuclide Name	Energy (keV)	Yield (%)	Line MDA (pCi/GWET)	Nuclide MDA (pCi/GWET)	Activity (pCi/GWET)
+	Ac-228	463.00*	4.45	6.4360E-001	2.04E-001	6.5174E-001
		755.31*	1.03	2.5350E+000		5.5649E-001
		772.29*	1.52	1.6781E+000		8.9338E-001
		794.94*	4.31	7.6412E-001		6.1088E-001
		835.70	1.70	3.4895E+000		1.4772E+000
		911.20*	26.20	2.0375E-001		8.2056E-001
		964.79	4.99	1.7938E+000		-1.6049E-001
		968.96*	15.90	2.7070E-001		8.3960E-001
		1588.20	3.06	1.9913E+000		3.3799E-001
		1630.62	1.52	2.9515E+000		2.0993E+000
	Th-228	84.37	1.26	5.5944E+000	5.59E+000	-1.3651E+000
		131.61	0.13	3.5252E+001		1.2500E-002
		166.41	0.10	4.2232E+001		8.8190E+000
		215.98	0.25	1.6806E+001		-2.4965E+000
	Pa-234m	258.23	0.07	5.5469E+001	7.29E+000	1.4912E+001
		742.81	0.09	5.2063E+001		-1.5478E+001
		766.36	0.32	1.8396E+001		-3.7039E+000
		786.27	0.05	9.6807E+001		5.5784E+001
		1001.03	0.85	7.2904E+000		5.5414E+000
		1737.77	0.02	1.9361E+002		-2.1205E+002
	Th-234	63.30	3.75	5.0236E+000	1.48E+000	7.5575E-001
		92.59	4.33	1.4831E+000		2.6549E+000
		112.81	0.22	2.0446E+001		1.5861E+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: A5-CS014-0006-01
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	0.998	1460.82*	10.55	1.42270E+001	5.18014E-001
Tl-208	0.828	72.80 @	2.02		
		74.97* @	3.41	3.01055E+000	3.28887E-001
		84.90 @	1.51		
		277.36	6.31		
		510.77* @	22.60	2.70921E-001	5.85836E-002
		583.19*	84.50	2.57054E-001	1.85061E-002
		763.13 @	1.81		
		860.56*	12.42	2.58406E-001	7.69208E-002
Bi-211	0.902	351.03*	13.00	1.50682E+000	1.04625E-001
Bi-212	0.561	39.86 @	1.06		
		727.33*	6.74	7.61317E-001	1.37679E-001
		785.37	1.11		
		1620.74	1.51		
		1806.00 @	0.09		
Pb-212	0.985	74.81*	10.40	9.87112E-001	1.11533E-001
		77.11*	17.50	9.64032E-001	7.97868E-002
		87.30*	7.81	3.02394E-001	1.17810E-001
		115.18 @	0.59		
		238.63*	43.30	7.98095E-001	4.30732E-002
		300.09*	3.28	6.22881E-001	1.96839E-001
Bi-214	0.595	76.86* @	0.43	3.94744E+001	3.29435E+000
		89.81 @	0.24		
		386.77 @	0.30		
		454.77 @	0.29		
		609.31*	45.49	5.76628E-001	3.70468E-002
		665.45 @	1.53		
		703.11 @	0.48		
		719.86 @	0.39		
		768.36*	4.89	5.65550E-001	1.14635E-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	5.22737E-001	8.59373E-002
		1133.66 @	0.25		
		1155.19 @	1.63		
		1207.68 @	0.45		
		1238.11	5.79		
		1280.96 @	1.43		

Nuclide Name	Id Confidence	Energy (keV)		Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Bi-214	0.595	1377.67*		4.00	4.97215E-001	1.74145E-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		
		1764.49*		15.40	6.80898E-001	7.67201E-002
		1847.42	@	2.11		
		1873.16	@	0.22		
		2118.55	@	1.14		
		2204.21	@	5.08		
Pb-214	0.945	53.28	@	1.20		
		74.81*		6.44	1.58895E+000	1.81153E-001
		77.11*		10.80	1.55705E+000	1.33990E-001
		87.30*		4.84	4.86379E-001	1.89712E-001
		242.00*		7.43	7.43181E-001	7.38205E-002
		258.87	@	0.52		
		274.80	@	0.47		
		295.22*		19.30	5.62850E-001	5.58687E-002
		351.93*		37.60	5.20831E-001	3.57847E-002
		462.00*	@	0.22	1.30810E+001	3.15195E+000
		533.66	@	0.19		
		785.96	@	1.07		
		839.04	@	0.59		
Ra-224	0.795	81.07	@	0.13		
		83.78	@	0.22		
		240.99*		4.10	1.35115E+000	1.33730E-001
Ra-226	0.776	81.07	@	0.20		
		83.78	@	0.33		
		94.90	@	0.15		
		186.21*		3.59	1.41054E+000	2.41254E-001
Ac-228	0.698	99.50	@	1.26		
		129.07*	@	2.50	4.87777E-001	2.44108E-001
		209.25*		3.97	8.29459E-001	2.03362E-001
		270.24*		3.55	7.98861E-001	2.25069E-001
		328.00		3.04		
		338.32*		11.40	6.94919E-001	9.27456E-002
		409.46	@	2.02		
		463.00*		4.45	6.51743E-001	1.58723E-001
		755.31*	@	1.03	5.56487E-001	5.42804E-001
		772.29*	@	1.52	8.93384E-001	2.71769E-001
		794.94*		4.31	6.10877E-001	1.82214E-001
		835.70	@	1.70		

Nuclide Name	Id Confidence	Energy (keV)	Yield (%)	Activity (pCi/GWET)	Activity Uncertainty
Ac-228	0.698	911.20*	26.20	8.20559E-001	6.88926E-002
		964.79	4.99		
		968.96*	15.90	8.39602E-001	8.73841E-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 *****
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	Nuclide Name		Nuclide Id Confidence	Wt mean Activity (pCi/GWET)	Wt mean Activity Uncertainty
	K-40		0.998	1.422704E+001	5.180144E-001
X	Cd-109		0.938		
	Tl-208	@	0.828	2.565165E-001	1.785631E-002
	Bi-211		0.902	2.025472E-001	1.762882E-001
	Bi-212	@	0.561	7.613167E-001	1.376795E-001
	Pb-212	@	0.985	6.906813E-001	3.488776E-002
	Bi-214	@	0.595	5.828118E-001	2.950702E-002
	Pb-214	@	0.945	4.508206E-001	4.962931E-002
	Ra-224	@	0.795	5.315302E-001	1.604791E-001
	Ra-226	@	0.776	1.410539E+000	2.412540E-001
	Ac-228	@	0.698	7.767545E-001	3.988580E-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: 12/16/2016 5:23:47 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
19	741.83	2.5794E-004	568.45	Tol.	Pa-234 Pa-234m

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

Errors quoted at 1.000 sigma